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Overcoming early job-insecurity in Europe

Explaining consequences of employment insecurity: The dynamics of scarring in the United Kingdom, Poland and Norway

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1 Introduction

This deliverable presents three country studies on scarring effects of early employment insecurity in the United Kingdom, Poland and Norway. Traditional analysis of scarring effects has favoured the analysis of the impact of the experience of unemployment on the experience of subsequent unemployment (state dependence) and the monetary costs of previous unemployment in terms of lower subsequent wages (see e.g. Arulampalam, Booth and Taylor 2000; Arulampalam, Gregg and Gregory 2001). The three present country studies go beyond the traditional analysis of scarring effects in order to better understand the trade-offs experienced by young female and male workers when faced with an insecure labour market integration. With national longitudinal data, original methodological designs and research focus, each study contributes in an original way to the research literature. All three studies pay special attention to gender and education as potential moderating variables of scarring effects.

Using the UK Household Longitudinal Survey data, *Margherita Bussi* and *Jacqueline O'Reilly* propose a modified index of complexity to measure early employment insecurity and its effects in the United Kingdom. In the context of an increasingly fragmented, flexible and fragile labour market it is useful to think of (early-) employment insecurity rather than of (early-) job insecurity (see e.g. Chung 2015), as the notion of employment insecurity is better at capturing how precariousness affects labour market integration. Drawing on the methodology of sequence analysis, the authors have developed an index of complexity that not only measures the lengths of different kind of job- and unemployment sequences and the number of transitions between them, but which also takes the quality of the experienced sequence states into account. The modified index of complexity permits them to go beyond a dichotomous approach to understanding employment and unemployment transitions and to provide a richer and more accentuated picture of how early periods of precariousness affect later labour market outcomes. The authors are investigating the relation between the complexity in individuals' trajectories and later labour market outcomes, thereby reinforcing established findings about the long-term scarring effects of early labour market insecurity.

The contribution of *Dominik Buttler* and *Piotr Michoń* is focusing on how previous and current unemployment influences the wellbeing of young people in Poland. Whereas previous research on scarring effects has privileged the analysis of pecuniary effects, the Polish study is focusing on the psychological costs of unemployment among young persons. Using the longitudinal survey 'Social Diagnosis' the authors model the relationship between unemployment and wellbeing among young individuals in Poland. They examine the direct and indirect effects of unemployment on wellbeing, the latter being proxied by life assessment and the occurrence of depression symptoms. The results show that past experience of unemployment has a detrimental effect on individual's wellbeing regardless of the current employment status. Thereby, the non-pecuniary costs of unemployment on psychological wellbeing are larger than the costs associated with loss of income. The Polish study increases our understanding of the individual and societal costs of unemployment beyond pecuniary costs.

The Norwegian study by *Dawit Shawel Abebe* and *Christer Hyggen* addresses the mechanisms behind scarring effects of precarious labour market experiences during early adulthood with a special focus on factors that moderate the strength of scarring. Using the 'Young in Norway' longitudinal study the authors investigate how individual and family characteristics (gender, social origin, level of education, psychological wellbeing) moderate the impact of early unemployment on the young people's employment chances – with respect to both unemployment and wages – during their transition to adulthood. Whereas the Polish study analyses how unemployment has lasting effects on wellbeing, the Norwegian study looks at how psychological wellbeing moderates potential detrimental effects of early precarious employment experiences in the long-term. The results confirm that unemployment cuts deeper and leaves more visible scars on some than on

others. The findings suggest that gender, levels of education, parental education and psychological wellbeing all moderate the effects of an early unemployment episode on the long-term labour market outcomes.

2 Measuring early employment insecurity and its effects in the United Kingdom: a modified index of complexity

By Margherita Bussi & Jacqueline O'Reilly

2.1 Introduction

We investigate to what extent early employment insecurity of young people's career immediately after the economic crisis affected their probability of being in employment using an index of complexity. This index measures the entropy and the number of transitions within a sequence (Gabadinho et al 2010). Entropy indicates the distribution and variability of positions within a sequence; the number of transitions within a sequence indicates the stability and instability of individual trajectories. This index can be used to predict, together with other covariates, to what extent the precariousness embedded in complex trajectories has an impact on the type of labour market outcomes.

We outline how and why we propose modifying the original index with weights in order to grasp the complexity of young people's trajectories. We calculate the index using the first three waves (2009-2012/2013) of the UK Household Longitudinal Study (UKHLS). We then examine the relationship between young people's trajectories with their labour market position in the fifth wave (2013-2014). We find that young people with unstable trajectories during the first three waves are more likely to be out of the labour market or in temporary employment in the fifth wave. The modified index of complexity provides a concise synthetic measure for comparing the degree of precariousness and examines the quality of trajectories over time.

2.2 Conceptualising and measuring turbulent, volatile and complex transitions

The study of labour market trajectories using *sequence analysis* has become popular because of its potential to situate single events into a broader context (Aisenbrey and Fasang 2010). Advances in longitudinal data collection and statistical techniques have made sequence analysis an increasingly popular method in life-course research (Brzinsky-Fay 2014). One of the strengths of this approach has been to allow us to compare seemingly disparate sets of transitions over a longer period of time than is often possible using time-series cross-sectional approaches. This body of research has mainly focused on socio-economic groups most at risk of experiencing negative trajectories and the factors associated with making these. Such an approach is particularly well suited to examining the early labour market trajectories for young people who are more likely to have turbulent entry into employment.

There are three examples in the literature on sequence analysis using synthetic indices to analyse the quality of individual trajectories. These are the indicator of turbulence (Elzinga and Liefbroer 2007); the indicators of volatility and integrative capability (Brzinsky-Fay 2007) and the index of complexity developed by Gabadinho et al. (2010). We discuss the merits of these before outlining the approach used here.

The *indicator of turbulence* developed by Elzinga and Liefbroer (2007) examined the de-standardisation of young people's family trajectories. The indicator could be used to identify whether "the number of family-life events is increasing, and if the order of relevant life-events has become more hectic or the duration spent in the different states decreases" (Elzinga and Liefbroer 2007). The authors examine changes in sequencing and the timing of events by comparing the de-standardisation life-course trajectories across cohorts of women for 19 European countries. They found that younger cohorts do not experience more events in their individual family-life trajectories. However, there is a much stronger variation between individuals related to the diversity and timing of these events.

The advantage of this indicator was that it captured a large number of changes and many distinctive states. Another advantage is its capacity to account for the repetition of events and the temporal gaps between them. However, a disadvantage is that it does not consider the substantive meaning of the various states experienced by the individual. Hence, their indicator does not calculate the degree of turbulence compared to a standard (non)-turbulent trajectory. Instead this measure captures the degree of predictability and variability of transitions between family-life events.

A second approach developed by Brzinsky-Fay (2007) uses the concepts of volatility and integrative capability, to analyse school to work transitions in Europe. Using comparable longitudinal data he identified different clusters of trajectories. He proposed two indicators to determine the quality of trajectories within these clusters. The *'volatility' indicator* is defined as the proportion of employment, education and apprenticeship episodes (positive positions in the labour market) in relation to the total number of episodes. The higher the value of the indicator, the more favourable the sequences are. The *'integrative capability' indicator* measures how quickly young people enter employment. This indicator weights the position of the employment episode, and gives higher weights to later employment spells in order to emphasize the process of integration (Brzinsky-Fay 2007). The advantages of this indicator is that it can be used to evaluate individual trajectories, and it is useful when the observed trajectory is expected to result in a final (more stable) state. Further, it accounts for the ratio between good and bad positions in the labour market. However, like for the previous indicator, it does not take into account the substantive meaning of a state in a sequence and what this means for future outcomes.

The third approach worth examining is the *'index of complexity'* (IC) developed by Gabadinho et al. (2010). This is useful when trying to grasp the instability of trajectories. It uses two components to account for i) the variety of the trajectory (entropy) and ii) the number of transitions a person makes. Entropy expresses (un-)predictability by accounting for the number of different states and the proportion of time spent in a particular state. Entropy is standardized at its maximum, i.e. when the person experiences all possible distinctive states in the labour market for the same proportion of time. The quantity of transitions between distinctive states is standardized to the maximum number of possible transitions in the sequence. This index has been applied by Jaroz and Papastefanou (2013) to compare the use of leisure time in Germany and in Poland in order to understand to what extent societal differences are reflected in the dynamics of time use.

The advantages of this index of complexity are that it is easy to calculate, it accounts for the number of different states that the person experiences as well as for the cumulative time spent in each distinctive state. Further, it takes into account the number of changes a person makes which is particularly relevant for young people who tend to make more transitions in the early part of their working lives compared to older generations (Gardiner 2016).

However, as with the other two indicators, this index also presents some similar limitations: it is not able to account for the quality of states the person experienced over the trajectory. These three indicators have important advantages, however they all share the drawback of not assigning any value to the different positions in the labour market.

For these reasons, the first aim of this paper is to find an index that overcomes these main shortcomings. Here we develop a 'modified index of complexity' (MIC) to measure the

precariousness of a trajectory that includes the number and distribution of states experienced, and that is also manageable to calculate and straightforward to interpret.

The second contribution of this paper lies on the use of this index as an independent variable. We are essentially interested in knowing how early labour market precariousness affects later outcomes, even over a relatively short period of five years since the economic crisis. A similar approach has also been used by Manzoni and Mooi-Reci (2011) using the *complexity of trajectories* as a dependent variable to examine the impact of early unemployment on later labour market trajectories. Using the *concept of turbulence* (Elzinga and Liefbroer 2007), they assess the turbulence of the trajectory before the first spell of unemployment using it as an explanatory variable. Antonini and Bühlmann (2015) also use a similar approach looking at the dynamic aspects of post-unemployment trajectories, re-entry into employment, returning to unemployment and mobility between different occupational categories.

Traditional analysis of labour market insecurity has tended to focus on a dichotomised distinction between the employed and unemployed. Safeguarding job security has been a key component of labour struggles since the mid 1970s as the ubiquity of the standard employment relationship has been undermined. Rising levels of precarious forms of employment as typified in the UK by zero hours contracts where working hours are not guaranteed,[1] are a reflection of this increasingly fragmented and fragile labour market. In these circumstances Schmid (1994 and 2004) has argued that it is more useful to think of (early-) employment insecurity rather than of (early-) job insecurity. Employment insecurity is better at capturing how precariousness affects labour market integration and how individual negotiate choices are embedded in multiple changes over time. Employment security can involve changing employer and job but maintaining an employment relationship and stable income (Chung and Van Oorschoot 2011). On the basis of this body of analysis we propose to develop an modified index of complexity to capture a range of labour market precariousness and test the hypothesis that:

> *H: The more hectic and dominated by non-employment or precarious forms of employment trajectories are, the more likely a young person will be unemployed, inactive or in temporary employment in their subsequent labour market position.*

2.3 Developing a modified index of complexity (MIC) to capture employment insecurity

The index of complexity is expressed by the following formula:

$$C(s) = \sqrt{\frac{nt(s)}{(\ell(s)-1)} \frac{h(s)}{h_{max}}}$$

Source: (Gabadinho et al 2010)

Where h_{max} is the maximum theoretical value of entropy given the possible states and *l(s)* is the length of the sequence; *nt(s)* represents the number of transitions in the sequence and *l(s)-1* represents the maximum number of transitions possible according to the length of the sequence (*l(s)*). Hence both entropy and the number of transitions are standardized to their maximum.

An important limitation of this index is that it does not make a qualitative distinction between states. Unemployment is equivalent in value to employment. This means that the index of

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complexity will be the same regardless whether two young persons make the same number of labour market changes and spend the same proportion of time in the two distinctive states.

A partial solution to this drawback is provided by using a "weighted entropy". The aim is to modify entropy so that the highest index of complexity would be reached when the young person experiences several transitions between negative labour market positions (i.e. inactivity and unemployment).[2] The idea is to include a utility weight for each position in the labour market so that employment spell is not equivalent to a non-employment spell. Kannappan (1980) has developed a modified model of entropy that could be used for this purpose:

$$- \sum_{i=1}^{n} w_i p_i \log p_i$$

In this specific case, w_i represents a utility, p_i the proportion of time spent in a labour market position. Assigning utility weights in indices is not easy and in composite indices several solutions can be proposed. For instance, they can be based on theory or statistically driven (Foa and Tanner 2012). For instance weights could also be derived by the probability of events happening to an individual or to the reference group or society to which the individual is related (Mendola et al 2011). In this contribution, we chose weights that are put in relation to four states: unemployment, inactivity, part-time permanent employment and temporary employment, vis-à-vis full-time permanent employment, which is considered the most secure state.

On the basis of this conceptualisation of employment insecurity the weights shown in Table 2-1 show the ratio between the proportion of young people in each position and the average transition probability of making the transition from that position to full-time permanent employment. A high weight means that there are a high proportion of young people in that position, but also that this group has a relative low average probability (over the three-year observation period) of entering full-time employment in the following month. Therefore, a spell spent in this position is a negative sign: it contributes to the complexity of the trajectory, and the person is at risk of "getting trapped". This is the case for inactivity, for example.

Table 2-1: Labour market positions and weights

Position	Weight
Employment full-time permanent	1.00
Employment part-time permanent	7.14
Employment full-time or part-time temporary	1.46
Unemployment	7.18
Inactivity (including education)	23.22

Source: UKHLS (waves 1 to 3), own calculations

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[2] It is important to recall that because the index of complexity is based both on entropy and the number of transitions, a labour market trajectory composed of only one employment spell would have an index of complexity equal to 0: no transitions and no change in status. A similar result would be obtained for the trajectory of a young person who spent the whole observation period in unemployment. The index of complexity would again be equal to 0 as the number of transitions and entropy are 0.

On the contrary, a low weight, such as for full-time or part-time temporary employment, is due to a very low proportion of young people in this situation position and a relative higher average probability of entering full-time employment in the following month. Table 2-1 shows the weights that resulted from calculations expressed above.

2.4   Who has complex trajectories?

We applied this MIC to a data sub-sample drawn from the first wave of the UK Household Longitudinal Survey (Understanding Society)[3]. This sample of young people (aged between 16 and 30 years old), excluding full-time students, was interviewed in all available five waves (2009-14).

We initially examined young people's trajectories over the first three years according to their labour market position being in one of six categories: « employed on a full-time permanent contract », « employed on a full- or part-time temporary contract»,[4] « employed on a part-time permanent contract », « being unemployed or in a government training scheme (active labour market policy)»[5], « inactive, including being in full-time education». [6] Each wave of UKLHS also includes retrospective questions on the monthly employment history. Information is precise enough to establish not only whether the person has changed labour market position but also in which month.

The sample descriptive statistics at wave 5 in 2014 are shown in Table A1 in the Annex. The sample includes around 2900 individuals. Young women represent 54% of the final sample, the mean age in wave 5 is 29 years old and the vast majority of young people live in an urban context. Only 3% of the sample declared they had no qualifications, while 42% had a university degree, 25% had obtained a GCSE certificate (General Certificate of Secondary Education) and 26% had A-level (Advanced Level) qualifications. A large part (44%) of young people were not married at the end of the observation period, the majority were married or living as couple. We also looked at young people born in and outside the UK. The vast majority of the sample (87%) were born in the UK.[7]

First we describe in Figure A1 to Figure A6 in the Annex the differences for the weighted and non-weighted entropy and indices of complexity. We then regress the weighted index of complexity on a more extensive list of socio-economic variables to determine which subgroups are more at risk of having a higher degree of complexity in their trajectories (see results in Annex, Table A2).

2.4.1   Educational level

Descriptive statistics comparing the weighted entropy versus entropy show that the weighted entropy makes the difference across educational level more marked (Figure A1). In particular, those

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[3] Understanding Society is an initiative by the Economic and Social Research Council, with scientific leadership by the Institute for Social and Economic Research, University of Essex, and survey delivery by the National Centre for Social Research and TNS BRMB.

[4] There are not enough observations for keeping the distinction between part-time and full-time temporary employment.

[5] Following the classification made by Dorsett and Lucchino (2014).

[6] This category excludes maternity leave which is included in being in employment according to the type of contract whenever possible; inactivity includes the more general category "something else". We are aware that including education in the same category of inactivity does not respond to the theoretical background based on the concept of resilience and the capability approach, where education is expected to play an empowering role. However, for sample-size reasons, we decided to merge these categories.

[7] A detailed and in-depth analysis of the barriers and opportunities faced by ethnic minorities in the UK is widely developed and discusses the differences across ethnic groups and generations of migrants (Zuccotti and O'Reilly forthcoming).

young people who have a medium educational degree (A-level) and those without qualifications show a statistically different weighted entropy. When investigating what determines higher entropy for these groups, we can see that young people with no qualifications have trajectories dominated by mostly unemployment and inactivity. They also have the lowest average length of full-time permanent employment. In contrast the low entropy of young people with a higher educational degree is due to long spells in full-time permanent employment and short spells in unemployment or inactivity (data not shown).

2.4.2   Gender differences

Young men and women also have different degrees of entropies, regardless if weighted or not. These are significantly different and higher for women. Young women spend on average significantly longer spells in inactivity and part-time permanent employment; while young men experience longer spells in full-time employment and longer spells in unemployment than young women.

2.4.3   Volatility, Stability and Complexity

As for the weighted index of complexity, half of the sample (see Figure A6) has a zero score on the index of complexity. This is due to a large majority of young people experiencing no transitions and no change in their full-time permanent employment. A small group experienced inactivity for the whole period while a minority spent the observation period in unemployment. Half of the sample experience one or more change during the 3 waves.

Figure A5 shows a scatter graph of the distribution of the weighted and non-weighted index of complexity. It shows that there is a higher variance in the weighted index of complexity, meaning that the weights were able to increase the degree of complexity for those young people who experienced change in their trajectories.

2.4.4   Comparing the weighted index of complexity

When looking at some descriptives, the index of complexity in its original form and its weighted form (i.e. with weighted entropy) provides similar results to those presented above. A weighted index of complexity brings out differences across educational attainment level more clearly (see Figure A4 in the Annex). The differences between young people with a higher educational degree and a medium qualification (A-level) or no qualifications at all do show significant high level of complexity in their trajectories.

2.4.5   Factors predicting the weighted index of complexity

These descriptive statistics already provided an idea of the results of the regression of the weighted index of complexity on some of the main socio-economic characteristics. Table A1 shows that age reduces the complexity of trajectories. We can expect that age indirectly reflects that a longer period of work experience is associated with a higher likelihood of being in a regular employment. Educational attainment was not significant in predicting a higher or a lower degree of complexity, even if it was significant for predicting a higher level of entropy overall. The lack of significance is likely to be due to the transition components of the index that, for all categories, is lower than the potential number of transitions. The level of parental education, both of the mother and the father, does not influence any of the dependent variables, in contrast to the findings of Berloffa et al. (2015).

Young Caribbean and African respondents had a higher degree of entropy on the index of complexity, meaning that they are more likely to have volatile trajectories as compared to British peers. Interesting, those young people who are no longer living in a couple – almost all young women - are also more likely to experience a higher level of entropy and a higher degree of complexity compared to young people who were never married.

The regression model explains 7.6% of the variance of the value of the weighted index in the sample. The low explanatory power of some of the most important socio-demographic variables could open in the future to including new control variables (e.g. the occupational sector) or limiting the analysis to young people who left school the previous year or who just experienced a period of unemployment. In this contribution, for sample size reasons, it was not advisable to limit the sample just to those who very recently left school.

2.5   The impact of complex trajectories on later labour market outcomes

Finally, we investigate the effect of the complexity of trajectories on later labour market outcomes. The weighted index of complexity is included, as an independent variable, in a set of logistic regressions investigating the probability of being in full-time or part-time permanent and temporary employment or being outside the labour market in the fifth wave of the survey. The regressions establish whether, all other things being equal, a unit increase of the weighted index of complexity increases the probability of being in unemployment, inactivity or temporary employment. The structure of the waves of the survey used and the information summarised in the index of complexity and how this is tested is shown in Figure 2-1. The index of complexity is calculated over the first three years. The hypothesis is tested on the labour market position in wave 5. A control variable was also included to capture those people who were in employment or not in wave 4. The aim was to control for any possible status dependence that would contribute to explain why the person is found in that labour market position in wave 5.

Figure 2-1: Structure of the weighted index and control variable

| Wave 1 | Wave 2 | Wave 3 | Wave 4 | Wave 5 |
| (2009-2010) | (2010-2011) | (2011-2012) | (2012-2013) | (2013-2014) |

Weighted index of Complexity   Variable on whether in employment in wave 4
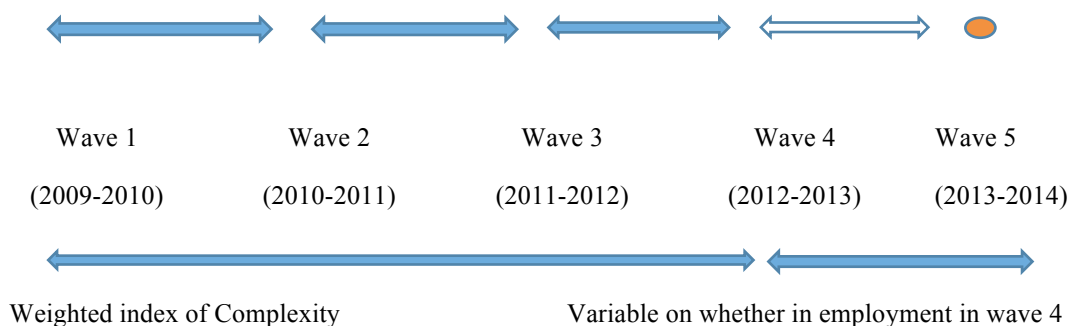
Table A2 presents the results of a multinomial logistic regression where the base outcome is full-time permanent employment. It shows that, all the things being equal, the higher the index of complexity, the more likely a young person is to be unemployed, inactive or in part-time employment rather than in full-time permanent employment. This confirms our hypothesis: more complex trajectories are more likely to lead to a higher risk of unemployment, inactivity, part-time and temporary employment. Being female and/or with low levels of qualifications is also associated with a higher likelihood of non-employed in the fifth wave. Surprisingly the ethnic background does not play any significant role in predicting a specific labour market position.

It is also interesting to note that even when including a control variable on the employment status of the previous wave, the index of complexity remains significant, suggesting that these variables are capturing two different aspects. The control variable looks at the path-dependence linked to the previous state (Allyon 2013); while the weighted index of complexity includes more complete information about the quality of previous trajectories and the amount of change in the preceding years.

We also run the analysis for men and women separately to see whether the associations between the independent and dependent variable changed for the two groups. Results for the index of complexity show that overall a higher complexity in trajectories remains a very significant predictor for temporary and part-time permanent employment and non-employment. The likelihood of being unemployed is associated with a higher index of complexity only for young women, while this is not the case for young men. Interestingly age is a significant predictor for women who are more likely to be non-employed as they grow older, but they are less likely to be in temporary employment. For young men, age is not a significant predictor.

A similar trend is also found for educational attainment. For young women, their level of educational attainment is a significant predictor. Having a lower level qualification is associated with a higher likelihood of being unemployed or inactive. This is not the case for young men, except for young men with no qualifications who are more exposed to inactivity compared to young men with a higher educational qualification or university degree.

Another interesting difference between men and women is that men are better off being in a couple as this reduces their likelihood of being unemployed or in part-time permanent employment. This is not the case for young women in a couple: they are less likely to be unemployed but more likely to be in part-time permanent employment. This does not come as a surprise as women are overrepresented in part-time employment that is common practice in the UK as a way to balance family and working life.

2.6 Conclusion

In sum, our analysis indicates that by developing a modified index of complexity this permits us to go beyond a dichotomous approach to understanding employment and unemployment transitions. By assigning data-driven weights to differentiate between levels of insecurity we can provide a richer and more accentuated picture of how early periods of precariousness affect later labour market outcomes. The modified index applied to five waves of the ULHLS, illustrated that higher levels of complexity in an individual's trajectory increased the probability of being in temporary or part-time employment, in unemployment or inactivity. This comprehensive measurement of employment insecurity, its degree, composition and effects reinforces established findings about the long-term scarring effects of early labour market insecurity. We are able to clearly identify very different trajectories for both young men and women in relation to the qualifications they obtain and their living arrangements. One of the key factors that protect young people relates to their levels of education. But we also found that nearly half the young people here did not have a complex trajectory (see Figure A 6) Although stability can be seen as positive, this was largely due to the fact that they remained in a particular status: employed, unemployed or inactive for the entire period over all five waves. Although the UK has a very flexible labour market these results also suggest that there are significant barriers preventing some young people moving into work, even if it is on a precarious footing.

3 Wellbeing scarring in Poland

By Dominik Buttler & Piotr Michoń

3.1 Introduction

In this research we focus on the psychological costs of unemployment among young persons in Poland. In particular we test whether the current and past unemployment experiences influence the individual wellbeing proxied by the life assessment and the occurrence of depression symptoms. We use the data from the longitudinal survey 'Social Diagnosis' which concentrates on the subjective and objective quality of life in Poland. The identification of the temporary as well as continued scarring effects increases our understanding of the individual and societal costs of unemployment.

3.2 Literature review and conceptual arguments

The literature review shows that there is little doubt that, for most of the population, losing jobs or being unemployed leads to a decreased level of subjective wellbeing (Bell and Blanchflower, 2009; Dooley and Prause, 2004; Harrison et al., 2016; Kapteyn et al., 2015; McKee-Ryan et al., 2005; Winkelmann and Winkelmann, 1998; for the overview see also: Dolan et al., 2008) or even depression (Dooley et al., 2000). This relationship was confirmed in the studies for different countries i.e. Germany (Frijters et al., 2004; Winkelmann and Winkelmann, 1998), Switzerland (Frey and Stutzer, 2000), and the United Kingdom (Clark, 2003; Clark and Oswald, 1994).

We can distinguish two main channels through which unemployment influences the wellbeing. Losing a job diminishes the income of an individual (the pecuniary effect of unemployment) but has also the direct detrimental impact on wellbeing (the non-pecuniary effect of unemployment). According to Jahoda (1982), who looked beyond the economic consequences of job loss, work affects individual's wellbeing by providing a structured day, opportunities for mastery and creativity, shared experiences and status. Thus, unemployment deprives an individual of all of the beneficial work by-products. Similar explanation for negative consequences of joblessness is provided by Warr and his 'vitamin model' of the benefits of work (physical and mental activity, use of skills, decision latitude, interpersonal contact, social status, and a reason to go on – 'traction' (Warr, 2007). Winkelmann and Winkelmann (1998) suggest that the effect of non-pecuniary costs of unemployment on psychological wellbeing is larger than the one associated with loss of income. Losing a job makes people unhappy and depressed but unemployment is not simply a mere interlude, which has no effect once it is over (Bartley, 1994). For example unemployment appears to have the negative long-term effect on future labour market possibilities in itself (Nilsen & Reiso, 2011) and the past unemployment can influence negatively wellbeing regardless of the current employment status (scarring effect) (Clark et al., 2001).

The relationship between unemployment and wellbeing is complex and there is a large number of economic, social, and psychological variables that moderate it. It has been found that unemployment is more detrimental for men than for women. According to the social production function theory people strive for wellbeing and social approval, and if so, men and women have different ways of achieving it (van der Meer, 2014). The negative wellbeing effect of unemployment can be weakened by social support (being married), work dissatisfaction (while employed), religiosity and strengthened by the level of education and the employment commitment (Dooley et al., 2000; Warr, 2007). When becoming employed individuals gain in emotional wellbeing, and the biggest gain in emotional wellbeing is concentrated among the individuals who start a full-time job, and not those who simply start to work (at least one hour per week) (Krueger &

Mueller, 2012). The results suggest that it is not enough to be employed but one needs to have 'a good job', which might be translated into full-time employment. According to Ilmakunnas and Böckerman (2006) the so called 'habituation effect' should mitigate the impact of joblessness on life satisfaction over time, which was confirmed statistically (see, Clark et al, 2001). Finally, Lindbeck et al. (1999) claim that higher regional unemployment rates should reduce the detrimental effect of joblessness. Hence unfavourable economic conditions should weaken the social stigma.

3.3   Empirical strategy

3.3.1   Model specification and data

In this study we use the data from all the waves of the Polish longitudinal survey 'Social Diagnosis' (2000, 2003, 2005, 2007, 2009, 2011, 2013, 2015). In the final sample we included those participants who were in the age group 18-30 in the first observed wave and took part at least in two waves of the study.

The dependent variable in the model is a binary variable based on the question about the respondents' entire life assessment (1 – delighted, pleased or most satisfying; 0 – mixed, mostly dissatisfying, unhappy, terrible). The study focuses on young individuals, hence we assume that this variable is highly correlated with the assessment of the current life. We use also the alternative proxy for wellbeing based on the respondents' assessment of their depression symptoms referring to the evaluation of their physical look, sleeping patterns, appetite, life energy, feeling of fatigue, health assessment, and interest in sex. If at least one symptom of depression is observed the dependent variable takes the value of 1 (0 otherwise).

The selection of regressors was based on the literature review presented in the previous section. The most important independent variable is the current unemployment status (the reference category is being full-time employed). Since we would like to test for scarring and the habituation effects (see Clark et al, 2001) we have included in the model the variable measuring the months of unemployment within the last two years and interacted it with the current unemployment status. The coefficients of the past unemployment variable will show the possible impact of the past unemployment on the current wellbeing (scarring effect) and the coefficient of the interaction term will measure the specific impact of current unemployment on individuals who experienced unemployment in the past (habituation effect). In order to separate pecuniary and non-pecuniary effects of unemployment on wellbeing we included two proxies for the financial situation – the household income per head and the individual assessment of household financial situation. In order to estimate the gender differences in unemployment-wellbeing relationship, we estimate the model for the entire sample and separately for women and men.

The quality of work is measured by the set of labour market attachment variables (being economically inactive, working part-time, being self-employed, being full-time student) and the family support by the civil status proxies (being parent, being married or in a partnership, being family head). Since the unemployment rate can affect both wellbeing and unemployment status we control for cyclical unemployment risk (which values are the residuals from regressing the regional unemployment rate on a linear time trend. This variable proxies the deviations from the (regional) unemployment rate trend, see Biewen and Steffes, 2008:4). The set of independent variables is complemented by regressors, which according to the literature review, can influence the employment-wellbeing relationship - health status, the level of religiosity, years of education and age. In the model where wellbeing is proxied by depression symptoms we do not include health status as a regressor since it seems to be a part of the dependent variable. Beside this, the set of independent variables remains the same in both models.

After the exclusion of cases with missing values for any independent or dependent variables, the final datasets consisted of 1182 individuals and 3549 observations in the model where life assessment proxied wellbeing, and 1883 individuals and 5593 observations in the model where

depression symptoms proxied wellbeing. The summary statistics are presented in the Annex in Table A6 and Table A7.

3.3.2   Methods

There are at least two serious methodological challenges in the estimation of unemployment-wellbeing relationship – the omitted variable bias (the relationship between wellbeing and unemployment could be heavily influenced by other factors which should be taken into account – e.g. the state of health which influences both wellbeing and employment status) and the reversed causality problem (the unemployment can reduce wellbeing but also, inversely, intrinsically less happy individuals can experience more difficulties in finding and maintaining jobs). The first problem is addressed through running the multiple regression models with carefully selected set of independent variables. The second problem is addressed through instrumental variable approach or through the application of the fixed-effect models, which exclude the impact of time-invariant omitted variables (e.g. the intrinsic level of happiness). Gerlach and Stephan (1996) showed that simple OLS models overestimate the effect on unemployment on wellbeing by 10-15 percent with comparison to fixed-effects models. Because of estimation challenges, in this research we exploit the longitudinal dimension of the dataset and apply the fixed-effect logit model using the variables specified in the previous section.

3.4   Empirical results

The results of fixed-effects logit model estimation where life assessment proxied the wellbeing (Table 3-1) show that even if we control for many observed but also unobserved time-invariant characteristics, there is a statistically significant detrimental effect of current and past unemployment on wellbeing. These results suggest that unemployment can have not only temporary but also more continued impact on wellbeing which is consistent with the unemployment scarring hypothesis. There are some signs of the habituation effect, very similar to those identified by Clark et al. (2001).

Table 3-1: Determinants of wellbeing (life assessment). The estimates of the fixed-effects logit model

	coef.	std. err.	p-value
unemployed	-0,628	0,173	0,000
past unemployment	-0,018	0,007	0,013
unemployed*past unemployment	0,022	0,013	0,089
bad health status	-0,663	0,112	0,000
household income per person	0,000	0,000	0,965
household income decreased	-0,221	0,083	0,008
age	-0,037	0,093	0,686
age2	0,001	0,002	0,393
year of education	0,096	0,041	0,018
children in the household	-0,213	0,187	0,255
married	1,201	0,200	0,000
family head	-0,160	0,188	0,393
religious	0,227	0,101	0,025
employed part time	-0,052	0,169	0,757
inactive	0,076	0,153	0,617
self-employed	0,118	0,266	0,657
student	-0,103	0,214	0,632
cyclical unemp. risk	-0,014	0,013	0,304

Table 3-2: The marginal impact of current unemployment on wellbeing by previous unemployment experience

months unempl.	marg. eff.	std. err.	p-value
0	-0,105	0,072	0,143
4	-0,091	0,061	0,134
8	-0,077	0,052	0,135
12	-0,063	0,045	0,158
16	-0,048	0,041	0,237
20	-0,033	0,041	0,421
24	-0,017	0,045	0,701

*The average marginal effects calculated with the assumption that fixed effect is 0

While the interpretation of the positive sign of the interaction term (see Table 3-1) can be misleading in non-linear models (see Ai and Norton, 2003), the estimates presented in the Table 3-2 show that the detrimental influence of current unemployment on wellbeing is highest for individuals who did not experience unemployment in the past and close to zero for persons who were unemployed over the last two years. However, the estimated marginal effects are not statistically significant. In order to check for gender-specific effects we re-estimated the model separately for men and women. The marginal effects presented in respective Table 3-3 show that the detrimental impact of current unemployment was statistically significant only in the group of men, which is consistent with previous empirical and theoretical analyses (no past unemployment effects were found in either subgroup).

Table 3-3 : Determinants of Unemployment. Gender specific marginal effects

	coef.	std. err.	p-value	N
Men	-0,103	0,042	0,015	1817
Women	-0,042	0,067	0,528	1732

*The average marginal effects calculated with the assumption that fixed effect is 0.

The inclusion of the household income variable allowed to distinguish two effects of unemployment on wellbeing: The direct effect and the indirect effect through reduced income. As explained by Clark and Oswald (1994) 'entering income as a control, and then calculating the coefficient on unemployment status, would give the pure non-pecuniary loss from joblessness' (Clark and Oswald, 1994: 567). The household income variable turned out to be highly insignificant (see Table 3-1). The possible explanation is that in the sample consisting of young individuals often cohabitating with their parents and earning relatively little, losing a job does not lead to the serious income decline. From this reason we included another income-related binary variable denoting individuals who claimed that their household income decreased since last year. Even when controlling for this variable, which has a significant detrimental effect on wellbeing, the strong unemployment effect has not changed. It suggests that the non-pecuniary aspect of job loss plays a big role among young unemployed in Poland.

The well-recognized determinants of happiness (being married, being religious) influence wellbeing positively also in our study. The estimated effect of the cyclical unemployment risk variable has the expected sign but is not statistically significant indicating that the macroeconomic factors do not influence the unemployment – wellbeing relationship. Similarly, we did not find any age effect. It could be partly caused by the sample design – by focusing on individuals from a relatively narrow cohort we reduced the variability of age. On the other hand the role of age in explaining the

relationship between wellbeing and unemployment is unclear. Some authors claim (e.g. Oswald and Clark, 1994) that younger cohorts suffer less from unemployment because in their age group this state is more likely. Whereas according to other researchers (e.g. Ilmakunnas and Böckerman, 2006) the detrimental effect should be particularly noticeable among younger cohorts as it harms their lifetime earnings more.

Table 3-4 : Determinants of wellbeing (depression symptoms). The estimates of the fixed-effects logit model

	coef.	std. err.	p-value
unemployed	0,147	0,149	0,324
past unemployment	-0,005	0,006	0,392
unemployed*past unemployment	-0,007	0,011	0,519
household income per person	0,000	0,000	0,980
household income decreased	-0,072	0,035	0,039
age	-0,358	0,079	0,000
age2	0,006	0,001	0,000
year of education	-0,011	0,029	0,699
children in the household	0,459	0,140	0,001
married	0,014	0,152	0,928
family head	-0,081	0,158	0,609
religious	-0,351	0,083	0,000
employed part time	0,331	0,140	0,018
inactive	0,373	0,124	0,003
self-employed	0,027	0,188	0,884
student	-0,090	0,164	0,583
cyclical unemp. risk	0,024	0,011	0,024

The model shown in Table 3-4 in which wellbeing is defined by depression symptoms gives less pronounced results. Many regression coefficients are not statistically significant, including current and past unemployment status. The most significant predictor of depression symptoms is age, which is consistent with the findings of existing research. The finding that inactivity or working part-time (a reference category is full-time employed) increases the risk of depression symptoms is in accordance with expectations. There are, however, some estimates that cast doubts on the validity of the model. In particular, it is difficult to find the explanation why persons who reported lower household income with comparison to the last year were less likely to suffer from depression symptoms.

3.5 Conclusion

In the analysis we have exploited the data from the longitudinal survey 'Social Diagnosis' to model the relationship between unemployment and wellbeing among young individuals in Poland. Controlling for many observed as well as time-invariant unobserved characteristics we have found that not only the current but also the past experience of unemployment has a detrimental effect on individual's wellbeing. The latter finding might suggest the existence of the so called scarring effect of unemployment which reduces the individual wellbeing regardless of the current employment status. Based on the results, it is difficult to infer whether young unemployed in Poland are getting used to their status. The estimated habituation effect has the expected sign but is not statistically significant. Our results suggest that the effect of non-pecuniary costs of unemployment on psychological wellbeing is larger than the one associated with loss of income. The non-pecuniary

effect is particularly apparent in the group of men, which is in accordance with the social production function theory expectations. Within this theory, especially for men, the successful job is a main way of achieving social approval. The detrimental impact of unemployment on wellbeing was noticeable only when the latter is proxied by the life assessment of the individuals. We have not found any association between present and past unemployment experiences and depression symptoms.

4 Moderators of unemployment and wage scarring during the transition to young adulthood – Evidence from Norway

By Dawit Shawel Abebe & Christer Hyggen

4.1 Introduction

Entering the labour force is one of the most significant life events for young adults, providing them material, psychological and social functions. The experience of unemployment or employment instability during young adulthood may have negative long-term effects on future labour market integration – so called *scarring effects* – as well as on subjective and objective wellbeing (Bell and Blanchflower 2011; Gregg and Tominey 2005; Luijkx and Wolbers 2009; Nilsen and Reiso 2011; Nordström Skans 2004; Schmillen and Umkehrer 2013).

The effect of scarring is well documented in the research literature, but less is known about the mechanisms behind such effects among young workers. The state of scarring has been explained by either exposure to early unemployment (i.e., state dependence) or by observed and/or unobserved individual and family characteristics affecting job offer or retention rates facing young people over time. Individual and family characteristics related to multiple domains may reveal direct and indirect pathways that suggest causal mechanisms of labour market outcomes among young people (Caspi et al. 1998). The direct pathway proposes that personal characteristic may directly affect job-search behaviour and job performance, which in turn influence opportunities for job offers and employment stability. The indirect pathway proposes that individual and family characteristics may negatively affect other life events, such as education – high school completion and college attendance – which is vital for securing employment (Caspi et al. 1998).

The present longitudinal study is aimed at investigating how the exposure to early unemployment episodes and individual and family characteristics during adolescence causally moderate long-term labour market outcomes in Norway. Insight into moderators of labour market outcomes is crucial to understand casual mechanisms underlying scarring effects. Such knowledge may also important for policy and programs aimed at reducing unemployment and improving the ability for young people to cope with and exit unemployment, as well as reducing socio-economic inequality in the general population.

4.2 Moderators of unemployment scarring

Gender has been commonly investigated as an individual factor moderating the scarring effects (Mooi-Reci and Ganzeboom 2015; Nilsen and Reiso 2011). It is due to potential gender differences in educational and occupational choice, and family patterns and preferences. Although unemployment and wage scarring are significantly found in both females and males (Mooi-Reci and Ganzeboom 2015; Nilsen and Reiso 2011), distinct gendered patterns of unemployment scarring

have been reported: Unemployment scarring may not accumulate with the duration and repetition of unemployment among women while this is true among men (Mooi-Reci and Ganzeboom 2015). Women could also subject to the weaker effects of unemployment scarring, which may relate to the loss of occupation specific knowledge and to the more temporary character of women's employment contracts (Mooi-Reci and Ganzeboom 2015).

The importance of *education* for employment and career opportunities is well documented. There is less evidence on the possible moderating effect of education on scarring. Studies have however documented more severe scarring effects of unemployment in terms of recurring or persistent unemployment and lower wages for young people with lower education (Grasdal 2001) and general skills (Hämäläinen 2003). Possible moderating effects of education on scarring could be given demand side or supply-side explanations (Helbling et al. 2016). Higher levels of education may signal higher productivity to a potential employer (Spence 1973), despite unemployment experience, or may be subject to a smaller degree of skills depreciation (Pissarides 1992) or loss of human capital over time (Becker 1964; Pissarides 1992).

So far, few studies have addressed how *other early individual and family characteristics* relate to the development of labour market outcomes during the transition to adulthood. One is the Dunedin Multidisciplinary Health and Development Study, which revealed the following predictors for youth unemployment (at age of 21 years): 1) human capital– poor academic qualifications and skills and limited parental resources; 2) social capital – growing up in a single-parent family, family conflict and lack of school attachment; and 3) personal capital – antisocial behaviours (Caspi et al. 1998). Moreover, findings from a UK longitudinal study supported the indirect pathway by indicating that antisocial boys had lower earnings during adulthood and that such poor employment outcomes could be mediated through poor educational attainment and higher rates of criminal conviction in early adulthood (Healey, Knapp and Farrington 2004).

Other studies found that self-control (Daly et al. 2015), self-esteem (Trzesniewski et al. 2006), social competence (Heckman, Stixrud and Urzua 2006; Masten et al. 2010), and substance use behaviors (Henkel 2011) in childhood may determine successful labour-force entry and job retention during adulthood, particularly in times of economic uncertainty (Daly et al. 2015). For instance, adolescents with problematic substance use behaviors may have limited ability to attain a favorable socio-economic status (SES), which support the social selection hypothesis (Henkel 2011). Furthermore, childhood health, parental SES and family functioning have been documented to impact future educational and labour market outcomes (Currie 2009; Elman and Angela 2004; Haas, Glymour and Berkman 2011).

However, it has remained unclear how these early individual and family characteristics causally associate or moderate the long-term labour market participation during the transition to adulthood. The present Norwegian longitudinal study is therefore aimed at investigating how the exposure to early unemployment episodes and individual and family characteristics during adolescence causally moderate long-term labour market outcomes (i.e., employment and wage status) in mid-thirties. Specifically, we analyse the following factors as moderators for the development of scarring effects: gender, level of education, parental SES (measured by levels of education) and psychological wellbeing (measured by mental distress and substance use behaviours).

4.3 Methods

4.3.1 Sampling strategies and participation rates

The present study employed data from the Young in Norway longitudinal study (YiN). The dataset includes questionnaire data collected in four waves: 1992 (T1; ages 12 to 20 years), 1994 (T2; ages 14 to 22), 1999 (T3; ages 19 to 28) and 2005 (T4; ages 25 to 34). The respondents at T4 (N=2890) were asked for their consent to link the survey data to public registry data, to which 2606 (90%) agreed. Out of this, in order to select a sample representing unemployed vs. employed (active in the

labour market), we excluded those who were students at T4 (N=249) or received social and welfare benefits (N=234) from our analyses. The sample population (N) for the present study was 2123. Figure A 7 in the Annex illustrates the sampling design and the participation rates across time points. Full details about the study design and sampling have been published elsewhere (Strand and von Soest 2008).

4.3.2   Register data variables

The population-register provides time-series data about socio-demographic and economic information for all legal residents in Norway. In the current study, we included *socio-economic status (SES) variables* such as the level of education for respondents and their parents, annual net income, unemployment status and welfare benefits (social and rehabilitation benefits). The records of these time-series variables were available from 1995 to 2007. We selected the record of these variables for the 2003-2007 period representing a period where the YiN participants could be active in the labour market (ages 23 to 37).

Labour market outcome variables in the present study were unemployment status and annual net income from 2004 to 2007. *Unemployment status* was coded as 0 = employed and 1 = being unemployed for at least one period during the last 12 months. *Annual net income* was measured in 1000 NOK. Unemployment status in 2003 was regarded as an early unemployment exposure to determine unemployment and wage scarring from 2004 to 2007.

The *participants' highest level of education* was coded as 1 = college and university and 2 = primary and secondary (i.e., one value for the whole period – from 1995 to 2007). A dummy variable (0 and 1) was constructed to indicate whether participants had received social benefits and rehabilitation benefits in the 2003-2007 period.

4.3.3   Survey data variables

Age and *gender* was recorded in all surveys. Male was coded as "0" and female as "1". Other independent variables were mainly selected from T1 and T2 measurements representing early predictors (i.e., adolescence period) of scarring effects, except impulsivity that was constructed from the T3 measurements. This approach helps in delineating temporal precedence between predictors and labour market outcomes, which is essential in establishing the causal associations between predictors and scarring effects. Details about the psychometric properties of instruments that were used to measure variables in the YiN study have been published elsewhere (Strand and von Soest 2008).

Alcohol intoxication was measured by asking participants to indicate how often they had "drunk so much that you felt clearly intoxicated" during the preceding 12 months, while *illicit drug use* was assessed by asking about the frequency of illicit drug use over the past 12 months (Barnea, Rahav and Teichman 1987; Johnson and Mott 2001). The response scale ranged from 1 ("never") to 6 ("more than 50 times") for both measures. Dummy variables were constructed: reported at least 10 times alcohol intoxication and used illicit drug once in the last 12 months were regarded as cut-off point to indicate problematic substance use behaviours.

Mental distress – symptoms of depression and anxiety – was measured with a 12-item short version of the Hopkins Symptom Checklist (SCL) (Derogatis et al. 1974). Using a response scale ranging from 1 (not at all) to 4 (extremely), respondents were asked to restrict their ratings to the preceding week. A mean sum of score for all items of equal or above 1.85 has shown to be a valid predictor for mental distress among subjects aged 16-24 years using SCL-10 (Strand et al. 2009). We applied this cut-off level to categorize low and high levels of mental distress.

A short version of the Parental Bonding Instrument (PBI) (Parker, Tupling and Brown 1979) was used to assess *parental bonding styles*. The PBI measures emotional relationship between participants and parents by focusing on two dimensions, parental care and parental overprotection. Each dimension consists of 5 items and the respondents rated each of them on a 4-point Likert scale from 1 ("very like") to 4 ("very unlike"). High scores on the care subscale indicate a parent–child relationship based on emotional warmth, closeness and empathy, whereas high scores on the overprotection subscale suggest parental obstruction of independent behaviour, as well as parental control and parental intrusion (Parker, Tupling and Brown 1979).

General self-esteem was measured using the Global Self-Worth Subscale from the revised version of the Harter's Self-Perception Profile for Adolescents (Harter 1988; Wichstrom 1995). Five items assess how an adolescent views himself/herself, with the response options ranging from 1 ("corresponds very poorly") to 4 ("corresponds very well"). Higher mean scores reflect high self-worth.

Conduct problems were measured by fifteen items that are closely related to criteria for conduct disorder (Pedersen, Mastekaasa and Wichstrøm 2001; Pedersen and Wichstroem 1995). Using a response scale ranging from 1 "0 times" to 6 "more than 50 times", participants were asked to restrict their actions to the last 12 months. High mean scores indicate serious conduct problems (i.e., delinquent acts, aggression and covert).

Scholastic competence was measured by the revised version of the Self-Perception Profile for Adolescents (SPPA) (Harter 1988; Wichstrom 1995), which includes two (both with five items) subscales, with the response options ranging from 1 = "corresponds very poorly" to 4 = "corresponds very well". High mean scores indicate a high level of perceived self-concept towards scholastic competence.

Impulsivity was measured by seven items; three of these items were designed by Eysenck et al (Eysenck et al. 1985), two were taken from a short version of the General Temperament Survey (Colder and Stice 1998), and the last two were constructed for the purpose of the present study. Mean scores were computed with high scores indicating a high level of impulsivity (reduced self-control).

4.3.4   Statistical analyses

We applied propensity-score matching (PSM) (Caliendo and Kopeinig 2008; Rosenbaum and Rubin 1983) to allow for causal conclusions about whether or not the exposure to early unemployment leads to the development of scarring effects (i.e., persistence of unemployment and loss of income during young adulthood). We further tested how the development of scarring effects are moderated by gender, levels of education, parental levels of education, substance use behaviours and mental distress. Since the YiN dataset includes comprehensive individual and family characteristics associated with the scarring effects, we controlled for these characteristics ensuring comparability between treated (unemployed early) and untreated (control; employed early) groups.

Logit models were applied to estimate propensity scores in STATA (using the *psmatch2* command) (Leuven and Sianesi 2011). As stated in the background section, matching covariates at T1 and T2 were included based on previous research suggesting that individual and family characterises may have important role in determining early labour market participation and scarring outcomes. These baseline covariates include age, gender, level of education, parental level of education, parental relationships, substance use behaviours, mental distress, anti-social behaviour, self-esteem, scholastic competence, and impulsivity.

Kernel and radius matching algorithms were applied with caliper matching at 0.01 and 0.001 propensity score and bootstrapping standard error. The analyses also imposed common support by dropping treatment observations whose propensity scores was higher than the maximum or less than the minimum propensity scores of the controls. These analytical approaches help in reducing bias

and estimating the variance of average treatment effects, and also in evaluating the robustness of the results (Caliendo and Kopeinig 2008; Cochran and Rubin 1973).

The matching quality was examined using standardized bias and t-Test (using the *pstest* command). When a baseline covariate showed the percentage bias above 5%, we repeated PSM analyses by adding interaction terms and/or excluding this covariate and re-assessed the matching quality. Visual analysis of the density of distribution of the propensity score in treatment and control groups were conducted to check any violations of the common support condition (using the *psgraph* command).

For all analyses, we specified predictors at T1 and T2 as a time-invariant in order to simplify model fitting and to avoid different time-person structure between outcome and predictor variables. A p-value less than 0.05 was considered statistically significant.

4.4 Results

4.4.1 Descriptive summary of the study populations

The mean ages of participants were 15.2 (T1); 16.6 (T2); 21.1 (T3) and 28.6 (T4) years. The sample population included 1174 (55.3%) females and 949 (44.7%) males. About 55% of the sample had accomplished college or university education and had at least one parent with college or university education. Details about individual and family characteristics of the study participants are presented in the Annex in Table A8.

Table 4-1 presents descriptive statistics and predicted probabilities of labour market outcomes over time. The proportion of unemployed was 12.3% in 2003 and declined to 5.4% in 2007. The predicted probability of being unemployed in 2004 if one was unemployed early (2003) was 47%, and then declined to 32% in 2007. The predicted probability of being unemployed in 2004 if one was employed in 2003 was 7% in 2004 and then increased to 11% in 2007. The results also showed that early unemployed had lower earnings (annual net income) over time as compared to those with early employment.

Table 4-1: Predicted probabilities for being unemployed showing how early employment status (2003) affecting the labour market outcomes from 2004 to 2007

Register data	2003	2004	2005	2006	2007
Unemployed – N (%)	262 (12.3)	271 (12.7)	231 (10.9)	158 (7.4)	115 (5.4)
Predicted probabilities for being unemployed if*					
Employed in 2003	-	0.07	0.08	0.10	0.11
Unemployed in 2003	-	0.47	0.39	0.34	0.32
Annual income in 1000 NOK – M (sd)	245.3 (156.2)	276.6 (141.3)	316.1 (185.9)	349.2 (192.9)	386.2 (249.1)
Predicted probabilities of earning if unemployed in 2003	-	-3.28	-3.20	-3.46	-1.93

4.4.2 The development of unemployment and wage scarring

Table 4-2 presents descriptive summaries of pre-treatment characteristics among treated (unemployed early) and control (employed early). The results show to some extent higher psychosocial problems among the treated than the control group.

The average treatment effects on the treated (being early unemployed) are presented in Table 4-3. The results show that the average treatment effect on unemployment scarring was statistically significant and close to 0.08 in all-matching methods. The average treatment effect on annual income was statistically significant and negative in kernel and radius matching (at 0.01 propensity score), suggesting the development of wage scarring among the treated over time.

Table 4-2 : Descriptive summary of pre-treatment characteristics among treated (early unemployed) and control (early employed) groups

Variables	Treated (N=260)	Control (N=1845)	P-value from chi^2/t-test
Age at T4– M (sd)	28.33 (1.87)	28.56 (1.76)	0.051
Gender – N (%)			0.905
Male	117 (45.00)	823 (44.61)	
Female	143 (55.00)	1022 (55.39)	
Level of education – N (%)			<0.001
Junior/Secondary	153 (58.85)	788 (42.71)	
College/University	107 (41.15)	1057 (57.29)	
Parental level of education – N (%)			0.060
Junior/Secondary	97 (37.89)	810 (44.12)	
College/University	159 (62.11)	1026 (55.88)	
Parental relationships - M (sd)			
Overprotective	2.10 (0.52)	2.03 (0.49)	0.037
Caring	3.09 (0.44)	3.18 (0.46)	0.003
Substance use behaviour – N (%)	61 (23.46)	413 (22.46)	0.050
Conduct problems – M (sd)	1.39 (0.31)	1.35 (0.34)	0.069
High levels of mental distress – N (%)	67 (25.87)	376 (20.55)	0.050
Scholastic competence – M (sd)	2.83 (0.45)	2.92 (0.46)	0.008
Self-esteem – M (sd)	2.90 (0.47)	2.94 (0.48)	0.203
Impulsivity – M (sd)	2.59 (0.42)	2.46 (0.44)	<0.001

N = number; M =Mean; % = percentage; sd = standard deviation; T = survey time

Table 4-3: Average treatment effect on the treated (being early unemployed) for the unemployment and wage scarring over time

Matching methods	Caliper	Outcomes - B(SE)	
		Unemployment scarring	Wage scarring (income in 1000NOK)
Kernel	0.01	0.085 (0.019)***	-47.768 (19.739)*
	0.001	0.085 (0.023)**	-47.768 (15.779)**
Radius	0.01	0.083 (0.024)***	-49.661 (17.806)**
	0.001	0.082 (0.025)**	-45.054 (23.538)

B = observed regression coefficients; SE = bootstrap standard errors in parenthesis; *** p<0.001, ** p<0.01, * p<0.05.

4.4.3 Moderators of the effects of treatment on unemployment and wage scarring

In Table A9 to Table A13 (see Annex), we repeated the PSM analyses stratifying by gender, levels of education, parental levels of education, mental distress and substance use behaviours, respectively. The latter show how psychosocial wellbeing moderates unemployment and wage scarring.

Results in Table A9 show that the average treatment effects on unemployment scarring were statistically significant and positive in all matching methods in females, while such effect was only found and marginally significant in kernel and radius matching at 0.01 propensity score in males. The average treatment effect on unemployment scarring was higher in females than males. For wage scarring, the average treatment effect was statistically significant among females, suggesting that early unemployment contributes to the development of wage scarring in females but not in males.

Results in Table A10 show that in all-matching method, the average treatment effects were statistically significant in predicting unemployment and wage scarring among individuals with low levels of education, except for the effect of wage scarring in radius matching at 0.001 propensity score. Such average treatment effect was only marginally significant among those with high levels of education in radius matching at 0.01 propensity score. Non-significant average treatment effects were found for wage scarring among those with high levels of education.

In Table A11, the average treatment effects on unemployment scarring were statistically significant regardless of the status of parental levels of education. The average treatment effects on wage scarring were significant in kernel matching among those who had parents with low levels of education.

Results in Table A12 show that the average treatment effects on unemployment scarring were statistically significant among those with low levels of mental distress, while such effect was only marginally significant for wage scarring in radius matching at 0.01 propensity score. Surprisingly, these average treatment effects were non-significant among those with high levels of mental distress.

In Table A13, results revealed that the average treatment effects on unemployment scarring were statistically significant among both individuals with and without problematic substance use behaviours, except for those without problematic substance use behaviours using radius matching at 0.001 propensity score. These treatment effects were almost twice higher among individuals with problematic substance use behaviours than those without problematic substance use behaviours. However, such treatment effect on wage scarring was only documented among those without substance use behaviours.

In all discussed PSM results (Table 4-3 and Table A9 to A13) the mean percentage bias was less than 5% for most covariates and the t-Test showed non-significant statistical differences in covariates mean for both groups. This result indicates that the matching strategies succeeded in making the distributions of the covariates similar between the treated and the control groups. Detailed results are available upon request from the authors.

4.5 Conclusion

Unemployment leaves scars on young individuals entering the labour market. Our findings reveal that an early unemployment episode is a causal risk factor of unemployment and income inequality during young adulthood: It implies that the state of dependence (being unemployed early) is regarded as a main pathway leading to the development of unemployment and wage scarring. This finding is consistent with previous results (Biewen and Steffes 2010; Gregg and Tominey 2005; Gregg 2001; Nilsen and Reiso 2011; Raaum and Røed 2006). Individuals who experienced early brief periods of unemployment remain more often unemployed and subject to loss of income for

extended periods during young adulthood. It further substantiates that early unemployment leaves young workers with long-term scars (Nilsen and Reiso 2011).

However, unemployment cuts deeper and leaves more visible scars on some than on others. Our findings suggest that gender, levels of education, parental education and psychological wellbeing moderate the effects of an early unemployment episode on the long-term labour market outcomes. Specifically, females appear to experience greater risk of more significant unemployment and wage scarring than males do. This finding is in contrast to prior studies on associations between gender and scarring. For instance, a register study in Norway reported almost similar levels of unemployment scarring for females and males (Nilsen and Reiso 2011). Another study in Netherland on the other hand indicated stronger effects of unemployment scarring among men than women, and also gender variations in mechanisms underlying unemployment scarring: The effects of unemployment scarring are predominately driven by human capital depreciation for women, while among men stigma effects play a central role (Mooi-Reci and Ganzeboom 2015). The more severe scarring effects on young females observed here may partly be due to the gender segregation of the Norwegian labour market in terms of occupations, where the public sector is dominated by female workers and the private sector is dominated by males (Jensberg, Mandal and Solheim 2012). Young males have a higher probability of experiencing unemployment due to their orientation towards the less protected private sector. Unemployment in female CVs may thus signal higher risk to potential employers.

Levels of education have showed marked effects on unemployment and wage scarring: Having a high level of education may buffer the development of unemployment and wage scarring over time. Our finding substantiates that level of education moderates scarring effects. Other studies correspondingly documented the importance of education in employment and career opportunities (Grasdal 2001; Hämäläinen 2003; Spence 1973).

Our results on the moderating roles of parental level of education and early psychological wellbeing are to some extent inconsistent. Prior studies have showed that parental SES impacts future educational and labour market outcomes among young people (Currie 2009; Elman and Angela 2004; Haas, Glymour and Berkman 2011), but the present study does not confirm such impact of parental level of education in the development of unemployment scarring.

We found the effects of an early unemployment episode on the development of unemployment scarring regardless of the status of substance use behaviours. However, such effects on unemployment scarring appear to be higher among young people with the history of problematic substance use behaviours. Prior evidence has demonstrated that problematic substance use may increase risk of becoming and remaining unemployed, since it negatively affects productivity, work performance, work absences and other risk factors associated with unemployment (Henkel 2011).

Significant impact of mental distress on unemployment scarring is only found among those with low than high levels of mental distress. It could be related to characteristics of adolescents reporting a higher level of mental distress; these adolescents could have a higher academic aspirations and perfectionism, which may be a reason of experiencing a high level of mental distress but it may not necessarily indicate poor mental health status that diminish the likelihood of participating and succeeding in the labour market. Alternatively, elevated levels of mental distress is limited to the adolescence period without considerable consequences on the future labour market outcomes. In addition, our findings do not support the moderating roles of psychological wellbeing on wage scarring.

This study has a number of limitations that require a careful consideration when interpreting the findings. First, the study was conducted during good macroeconomic conditions, so that scarring effects could be less pronounced (Tumino 2015). Second, our study did not separate the effects of scarring based on entry conditions to labour market, years and types of employment. Third, unemployment duration and quality of employment status (e.g., temporary or permanent) was not taken into consideration due to lack of data. Finally, we only followed about 25% of the

representative sample at T1. Even though most of the attrition was planned, and attrition analyses showed some significant differences between those who dropped out and those who completed the study (Abebe et al. 2012; Wichstrom 2000), the large proportion that dropped out from the follow-ups could be a source of bias.

5   Summary

By applying different methods and focusing on different aspects of scarring effect caused by early insecurity in labour market, all three studies contribute to labour market research each from another perspective. By modifying Gabadinho et al.'s (2010) index of complexity, the UK study on early labour market trajectories and outcomes succeeded to add a quality dimension to the different states that constitute those trajectories (sequences). The researchers were able to show that the higher the level of complexity of the trajectories, the more likely are individuals to end up in part-time or temporary employment, unemployment and inactivity. Furthermore, the respective scarring effects differ for men and women, and they also vary with the level of education. For further research, the authors recommend to focus more on trajectories rather than on single jobs spells, because the accumulation of insecurity in the labour market over time is essential to explain why some groups are more at risk of scarring than others. This is particularly interesting when designing labour market regulations and active labour market policies: Thinking of trajectories instead of transitions could lead to a different approach to unemployment or inactivity welfare provision and activation.

The Polish and Norwegian studies both look at the correlation between employment status and wellbeing. Whereas the Polish study has identified negative consequences of past and current unemployment on psychological wellbeing, the Norwegian study found that psychological wellbeing can also moderate the detrimental effect of previous unemployment on subsequent labour market outcomes. In showing that psychological wellbeing can act both as a consequence and as a moderator of scarring the two studies demonstrate the complex relationship between employment experience and psychological wellbeing. Future studies may further investigate the causal relationship between wellbeing and labour market experiences by taking the entry conditions to the labour market into account, as well as individuals' trajectories, the quality of employment status and socio-economic backgrounds. It is also suggested to examine whether the detrimental effect of unemployment on wellbeing underlie the same mechanisms across different age groups.

Testing the analytical models separately for women and men, the three country studies show evidence for both converging and complementary gender effects, which underlay the processes of scarring. In the UK, young women spend on average significantly longer spells in inactivity and part-time permanent employment, whereas young men experience longer spells in full-time employment but also longer spells in unemployment than young women. Yet, complex trajectories are mainly associated with being unemployed for young women, but not for young men. The findings from Norway, where females experience a greater risk of unemployment and wage scarring than males do, confirms that women face stronger pecuniary costs of employment insecurity. However, the Polish study has highlighted that men suffer more often detrimental effect of past unemployment experience on individual's wellbeing compared to women.

The British and the Norwegian study furthermore highlight a strong effect of education with regard to scarring processes. Similar to Norway, where low level of education goes along with higher unemployment and wage scarring over time, young people with no qualifications in the UK have trajectories dominated by mostly unemployment and inactivity, and they have the lowest average length of full-time permanent employment. In contrast, young people with a higher educational degree show long spells in full-time permanent employment and short spells in unemployment or inactivity. Yet, the British study also shows that the level of educational attainment is first of all a predictor for women to be unemployed or inactive, whereas this is not the case for young men. This

finding points to the fact that more intersectional analysis of scarring processes are needed that take the interlocking of gender and education into consideration.

Still, the focus on different dimensions of scarring processes and outcomes, as well as the different (uncoordinated) longitudinal surveys the findings stem from, call for caution when comparing the three country studies. With regard to the international comparative aim of NEGOTIATE work package 6, a macro-level analysis of scarring will complement the national case studies in order to yield confident cross-nationally comparative results on an empirical level with respect to long-term scarring. Drawing on a large-scale series of national cross-section data of the European Labour Force Survey (EU-LFS), this methodological strategy will make use of aggregated youth unemployment rates to gauge and proxy early employment insecurity as well as future integration difficulties of youth cohorts entering the labour market during recession form a comparative European perspective. The results from this comparative study will be presented in Deliverable 6.3.

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Annex

Figure A 1: Comparing entropies by educational attainment
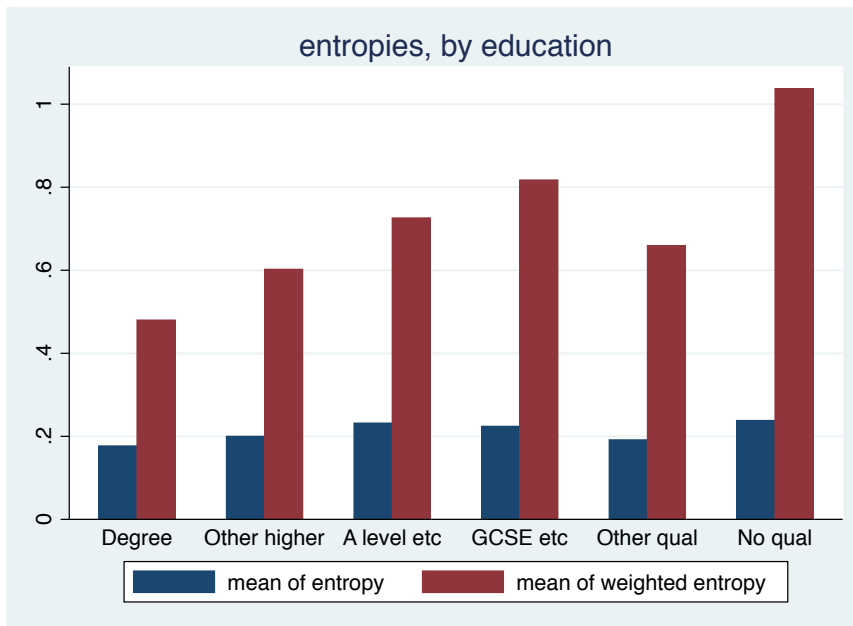
Source: UKHLS, calculated with longitudinal weights for wave 4

Figure A 2: Comparing entropies by gender
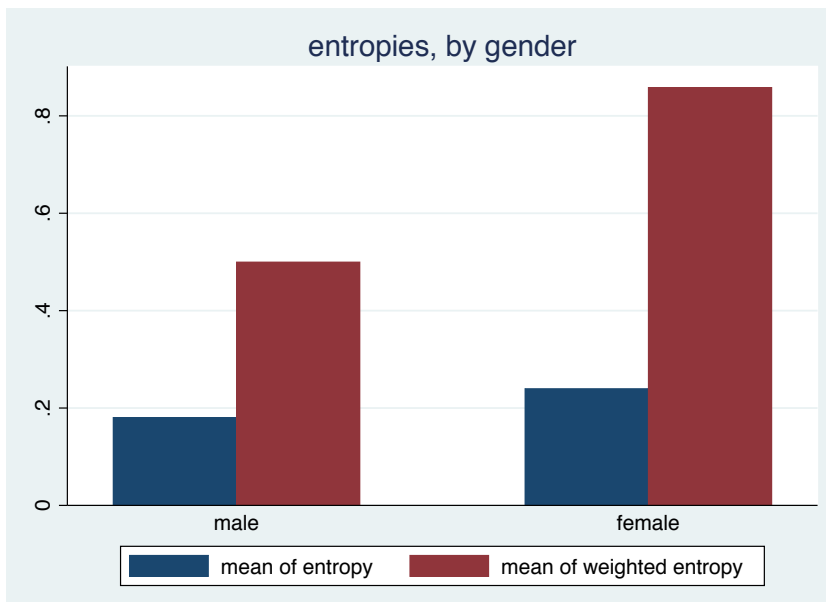
Source: UKHLS, calculated with longitudinal weights for wave 4

Figure A 3: Indices by gender

indices of complexity, by gender
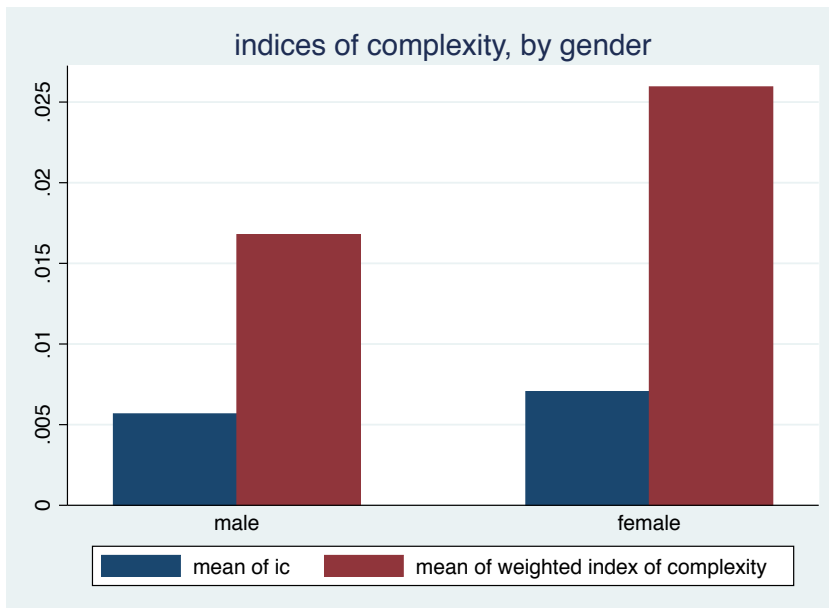
Source: UKHLS, calculated with longitudinal weights for wave 4

Figure A 4: Indices by educational attainment

indices of complexity, by education
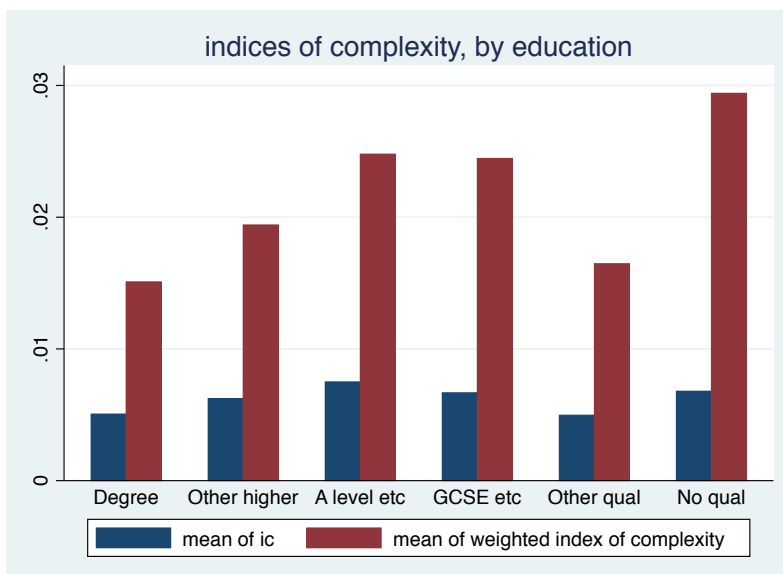
Source: UKHLS, calculated with longitudinal weights for wave 4

Figure A 5: Comparing indices

Source: UKHLS, calculated with longitudinal weights for wave 4

Figure A 6: Weighted index of complexity by quintile
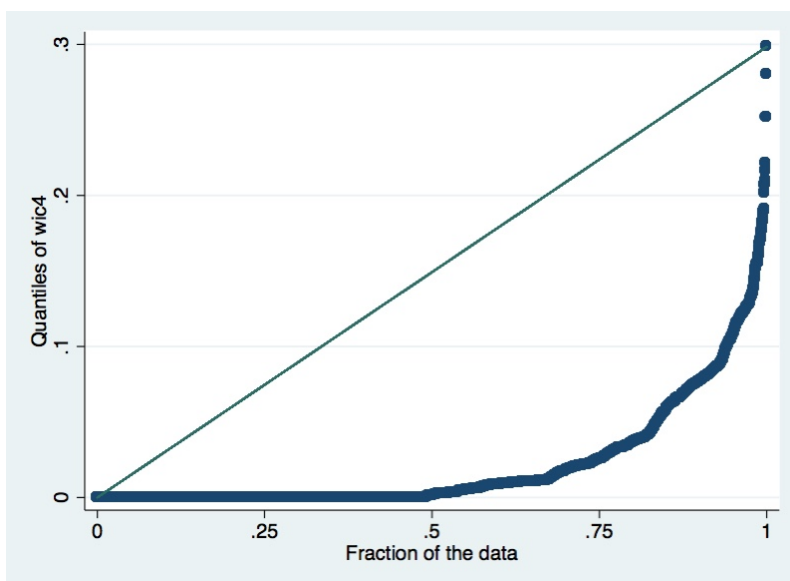
Source: UKHLS, calculated with longitudinal weights for wave 4

Figure A 7: A flow chart showing the sampling design and participation rates in the Young in Norway study
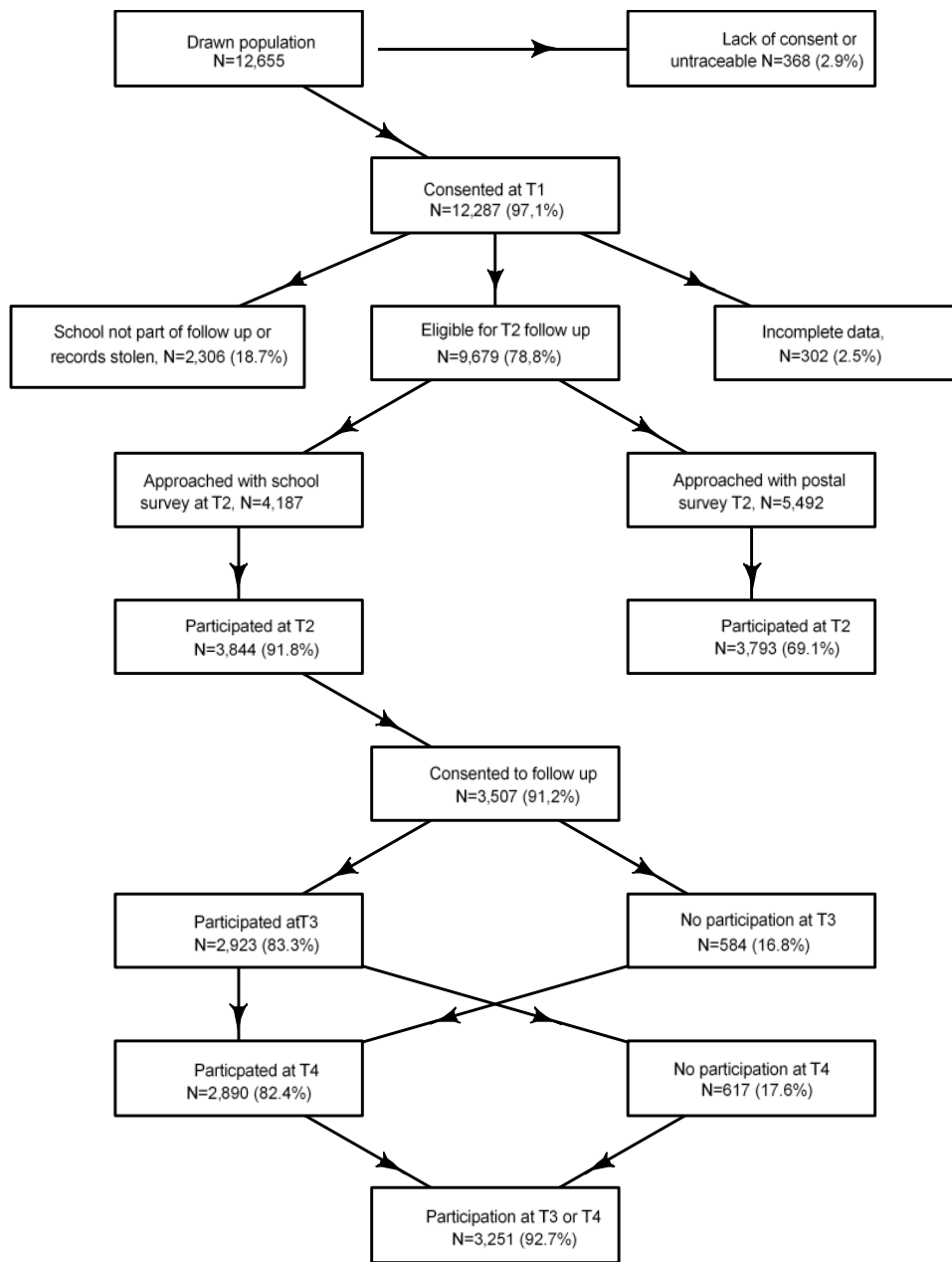
Table A 1 : Sample descriptive statistics at wave 5 in 2014

	Weighted proportions
Gender	
Men	47
Women	54
Age	
Average age at wave 5	29
Place of residence	
Urban	83
Rural	17
Educational attainment	
Degree	30
Other higher degree	11
A level	26
GCSE	25
Other qualification	3
No qualification	4
Country of birth	
Born in the UK	87
Not born in the UK	13
Mother's educational attainment	
She did no go to school	1
She left school with no qual	16
She left school with some qual	38
She gained a post school qualifications	24
She gain a university degree	14
Others	0.3
I don't know	7
Father's educational attainment	
He did no go to school	1
He left school with no qual	17
He left school with some qual	30
He gained a post school qualifications	26
He gain a university degree	14
Others	0.3
I don't know	11
Marital status	
Single and never married	44
In a couple	55
Previously in a relationship	1

Source: UKHLS, wave 5, longitudinal weights

Table A 2 : Determinants of the modified Index of Complexity and Weighted entropy

Independent variables	
Gender (ref: male)	
Female	1.062 (0.171) ***
Age	-0.193 (0.0298) ***
Place of residence (Ref: urban)	
Rural	-0.0372 (0.223)
Educational degree (ref: Higher Ed. Degree)	
Other higher degree	-0.0789 (0.253)
A-level	0.245 (0.244)
GCSE	0.293 (0.252)
Other qualification	0.0237 (0.469)
No qualification	0.522 (0.537)
Mother's ed. attainment (Ref: she did not go to school at all)	
She left school without qualification	-0.353 (0.553)
She left school with some qualification or certificate	-0.554 (0.515)
She gained post-school quals	-0.435 (0.520)
She gained university degree	-0.0293 (0.543)
Other	-0.572 (0.801)
Don't know	-0.295 (0.693)
Father's ed. attainment (Ref: she did not go to school at all)	
He left school without qualification	0.263 (0.628)
He left school with some qualification or certificate	0.432 (0.593)
He gained post-school quals	0.143 (0.611)
He gained university degree	0.344 (0.625)
Other	2.123 (1.824)
Don't know	0.197 (0.658)
Born in the UK (Ref: Born in the UK)	
Not born in the UK	0.306 (0.209)
Marital status (Ref: Single and never married)	
Couple	-0.268 (0.195)
Previously in a relationship	0.953 (0.555)*
Constant	6.813 (1.087)***
Observations	2852
R-squared	0.082

Source: UKHLS, wave 5, longitudinal weights

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table A 3 : Multinomial logistic regression – base exit Full-time permanent employment, coefficients

Full-time permanent employment – base outcome	Unempl.	Inactivity & Education	Temp. Empl	Part-time Perm. Empl.
Weighted index of complexity (*100)	0.100	0.240***	0.204***	0.131***
	(0.0779)	(0.0595)	(0.0455)	(0.0348)
Gender (ref: male)				
Female	0.144	0.639	0.229	1.573***
	(0.716)	(0.565)	(0.286)	(0.234)
Age	0.0193	0.264***	0.00488	0.0250
	(0.0768)	(0.0700)	(0.0385)	(0.0288)
Place of residence (Ref: urban)				
Rural	-1.200	0.707*	-0.214	0.197
	(1.092)	(0.427)	(0.301)	(0.197)
Educational degree (ref: Higher Ed. Degree)				
Other higher degree	-0.230	0.728	-1.088*	0.585**
	(0.660)	(0.753)	(0.554)	(0.265)
A-level	0.642	1.583***	0.0146	0.621**
	(0.815)	(0.536)	(0.333)	(0.258)
GCSE	0.0644	2.756***	-0.171	1.211***
	(1.023)	(0.760)	(0.378)	(0.281)
Other qualification	1.074	3.685***	-0.834	1.458*
	(0.660)	(0.736)	(0.838)	(0.767)
No qualification	1.922**	3.029**	-0.343	1.304
	(0.822)	(1.522)	(1.399)	(0.869)
Born in the UK (Ref: Born in the UK)				
Not born in the UK	0.471	0.770*	-0.0611	0.128
	(0.518)	(0.424)	(0.333)	(0.223)
Marital status (Ref: Single and never married)				
Couple	-1.298*	0.334	-0.288	0.113
	(0.786)	(0.535)	(0.322)	(0.199)
Previously in a relationship	0.101	1.557	0.227	-0.0932
	(1.396)	(1.169)	(0.775)	(0.536)
Position previous wave (Ref: Employed)				
Unemployed	9.209***	5.764***	2.650**	-13.39***
	(0.715)	(1.174)	(1.329)	(0.951)
Inactive	3.899***	11.74***	3.040***	3.002***
	(1.224)	(0.873)	(0.593)	(0.771)
Constant	-5.805**	-17.53***	-2.697**	-4.164***
	(2.425)	(2.244)	(1.107)	(1.018)
Observations	2,883	2,883	2,883	2,883

Source: UKHLS, wave 5, longitudinal weights

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table A 4 : Multinomial logistic regression - for women, base outcome, full-time permanent employment, coefficients

Full-time permanent employment (base outcome)	Unemployed	Inactivity & education	Temporary employment	Part-time Perm. empl.
Weighted index of complexity (*100)	0.111**	0.145***	0.212***	0.136***
	(0.0562)	(0.0451)	(0.0411)	(0.0349)
Age	0.0735	0.104**	-0.0891*	0.0356
	(0.0620)	(0.0456)	(0.0487)	(0.0297)
Place of residence (Ref: urban)				
Rural	0.167	0.361	-0.0582	0.342
	(0.731)	(0.383)	(0.392)	(0.213)
Educational degree (ref: Higher Ed. Degree)				
Other higher degree	0.526	0.253	-0.967**	0.666**
	(0.857)	(0.457)	(0.428)	(0.293)
A-level	1.833***	1.145**	0.293	1.005***
	(0.694)	(0.454)	(0.374)	(0.267)
GCSE	2.969***	2.001***	-0.449	1.490***
	(0.650)	(0.505)	(0.552)	(0.263)
Other qualification	2.684***	2.168***	-16.17***	1.308
	(0.976)	(0.695)	(0.570)	(1.056)
No qualification	2.958**	2.373**	0.212	1.079
	(1.269)	(1.067)	(1.757)	(0.902)
Born in the UK (Ref: Born in the UK)				
Not born in the UK	0.756*	0.0130	0.112	0.0938
	(0.445)	(0.362)	(0.353)	(0.231)
Marital status (Ref: Single and never married)				
Couple	-1.105**	0.394	0.285	0.598***
	(0.490)	(0.339)	(0.349)	(0.204)
Previously in a relationship	-0.133	0.0492	0.940	0.0148
	(1.056)	(1.066)	(0.810)	(0.585)
Position previous wave (Ref: Employed)				
No	19.15***	7.832***	0.526	0.580*
	(0.325)	(0.252)	(0.400)	(0.324)
Constant	-22.73***	-10.82***	-0.244	-3.337***
	(1.955)	(1.497)	(1.392)	(0.943)
Observations	2,517	2,517	2,517	2,517

Source: UKHLS, wave 5, cross-sectional weights
Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table A 5 : Multinomial logistic regression - for men – full-time permanent employment as base outcome, coefficients

Full-time permanent employment (base outcome)	Unemployed	Inactivity & education	Temporary employment	Part-time Perm. empl.
Weighted index of complexity (*100)	-0.0273	0.252***	0.199***	0.145**
	(0.100)	(0.0747)	(0.0717)	(0.0698)
Age	-0.0845	-0.0797	0.0137	-0.0905
	(0.0785)	(0.0692)	(0.0470)	(0.0622)
Place of residence (Ref: urban)				
Rural	-0.0441	0.960	-0.214	-0.106
	(0.807)	(0.727)	(0.348)	(0.428)
Educational degree (ref: Higher Ed. Degree)				
Other higher degree	-0.675	-0.163	-1.391	0.210
	(1.105)	(0.995)	(1.027)	(0.651)
A-level	-0.963	0.382	-0.609	-0.404
	(0.749)	(0.899)	(0.482)	(0.591)
GCSE	-0.623	0.320	-0.485	0.259
	(0.601)	(0.882)	(0.411)	(0.672)
Other qualification	-0.595	0.956	-1.261	1.106
	(0.862)	(0.836)	(0.866)	(0.832)
No qualification	0.613	2.203**	-0.938	0.901
	(0.852)	(1.061)	(1.651)	(0.908)
Born in the UK (Ref: Born in the UK)				
Not born in the UK	-0.650	0.276	-0.207	0.349
	(0.676)	(0.669)	(0.468)	(0.392)
Marital status (Ref: Single or previously married)				
Couple	-1.626***	-0.766	-0.715	-0.920**
	(0.608)	(0.657)	(0.440)	(0.426)
Position previous wave (Ref: Employed)				
No	5.646***	6.156***	1.402***	0.0421
	(0.352)	(0.398)	(0.468)	(0.663)
Constant	-2.097	-4.968**	-2.415*	0.225
	(2.097)	(2.106)	(1.300)	(2.014)
Observations	2,072	2,072	2,072	2,072

Source: UKHLS, wave 5, longitudinal weights

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.10

Table A 6 : Determinants of wellbeing (entire life assessment). Summary statistics (pooled sample)

variable	obs.	mean	std. dev.	min	max
wellbeing (entire life assessment)	3,549	0,569	0,495	0,000	1,000
unemployed	3,549	0,164	0,370	0,000	1,000
past unemployment	3,549	4,440	7,681	0,000	24,000
bad health status	3,549	0,175	0,380	0,000	1,000
household income per person	3,549	1098,162	744,515	45,620	9523,810
household income decreased	3,549	0,393	0,488	0,000	1,000
Age	3,549	28,098	5,001	18,000	45,000
age2	3,549	814,486	292,540	324,000	2025,000
years of education	3,549	12,601	2,599	3,000	23,000
Parent	3,549	0,382	0,486	0,000	1,000
married	3,549	0,373	0,484	0,000	1,000
family head	3,549	0,347	0,476	0,000	1,000
religious	3,549	0,594	0,491	0,000	1,000
employed part time	3,549	0,070	0,255	0,000	1,000
inactive	3,549	0,167	0,373	0,000	1,000
self-employed	3,549	0,030	0,171	0,000	1,000
student	3,549	0,165	0,371	0,000	1,000
cyclical unemp. risk	3,549	-0,026	2,661	-6,092	6,371

Source: Polish longitudinal survey 'Social Diagnosis'

Table A 7 : Determinants of wellbeing (depression symptoms). Summary statistics (pooled sample)

variable	obs.	mean	std. dev.	min	max
wellbeing (depression symptoms)	5,593	0,508	0,500	0,000	1,000
unemployed	5,593	0,122	0,328	0,000	1,000
past unemployment	5,593	3,684	7,170	0,000	24,000
household income per person	5,593	1279,965	893,752	65,941	11611,710
household income decreased	5,593	0,325	0,468	0,000	1,000
Age	5,593	28,157	4,957	18,000	45,000
age2	5,593	817,398	289,292	324,000	2025,000
years of education	5,593	13,316	2,811	6,000	28,000
Parent	5,593	0,417	0,493	0,000	1,000
married	5,593	0,450	0,498	0,000	1,000
family head	5,593	0,415	0,493	0,000	1,000
religious	5,593	0,641	0,480	0,000	1,000
employed part time	5,593	0,066	0,249	0,000	1,000
inactive	5,593	0,170	0,375	0,000	1,000
self-employed	5,593	0,043	0,203	0,000	1,000
student	5,593	0,183	0,387	0,000	1,000
cyclical unemp. risk	5,593	-0,091	2,630	-6,092	6,371

Source: Polish longitudinal survey 'Social Diagnosis'

Table A 8 : Young in Norway Longitudinal - descriptive summary of the study participants (N=2123)

Variables	N / M	% / sd
Age – M (sd)		
T1 (1992)	15.2	1.9
T2 (1994)	16.6	1.9
T3 (1999)	22.1	1.8
T4 (2005)	28.6	1.9
Gender – N (%)		
Male	949	44.7
Female	1174	55.3
Level of education – N (%)		
Junior/Secondary	954	44.9
College/University	1168	55
Parental level of education at 16 yrs-old – N (%)		
Junior/Secondary	909	43.1
College/University	1201	56.9
Parental relationships - M (sd)		
Overprotective at T1	2.1	0.5
Overprotective at T1	2.0	0.5
Caring at T1	3.2	0.5
Caring at T2	3.1	0.5
More often alcohol intoxication at T1 – N (%)	213	10.9
More often alcohol intoxication at T2 – N (%)	370	17.7
Use of cannabis at T1 – N (%)	58	2.9
Use of cannabis at T2 – N (%)	114	5.5
Conduct problems at T1 – M (sd)	1.3	0.4
Conduct problems at T2 – M (sd)	1.4	0.4
Mental distress at T1– M (sd)	1.5	0.4
Mental distress at T2– M (sd)	1.6	0.5
Scholastic competence at T1 – M (sd)	2.8	0.5
Scholastic competence at T2 – M (sd)	2.9	0.5
Self-esteem at T1– M (sd)	2.9	0.5
Self-esteem at T2– M (sd)	3.0	0.5
Impulsivity at T3 – M (sd)	2.5	0.4

T1-T4 represents survey time points; N = number; M =Mean; % = percentage; sd = standard deviation

Source: Young in Norway Longitudinal Study

Table A 9 : Average treatment effect on the treated (being early unemployed) for the unemployment and wage scarring among females and males over time

		Outcomes - B(SE)	
Matching methods	*Caliper*	Unemployment scarring	Wage scarring (income in 1000 NOK)
Females			
Kernel	0.01	0.095 (0.031)**	-41.584 (9.918)***
	0.001	0.094 (0.022)**	-41.584 (8.939)***
Radius	0.01	0.086 (0.033)**	-41.449 (12.709)**
	0.001	0.083 (0.037)*	-42.519 (14.823)*
Males			
Kernel	0.01	0.061 (0.028)*	-51.409 (47.093)
	0.001	0.061 (0.033)	-51.409 (48.572)
Radius	0.01	0.058 (0.025)*	-57.100 (41.782)
	0.001	0.055 (0.029)	-48.516 (46.591)

B = observed regression coefficients with bootstrap standard errors in parenthesis; *** $p<0.001$, ** $p<0.01$, * $p<0.05$.

Source: Young in Norway Longitudinal Study

Table A 10 : Average treatment effect on the treated (being early unemployed) for the unemployment and wage scarring among those with low and high levels of education over time

		Outcomes - B(SE)	
Matching methods	*Caliper*	Unemployment scarring	Wage scarring (income in 1000 NOK)
Low level of education			
Kernel	0.01	0.111 (0.029)***	-55.694 (17.830)**
	0.001	0.101 (0.043)*	-55.694 (21.361)**
Radius	0.01	0.095 (0.037)**	-54.631 (22.810)*
	0.001	0.107 (0.046)*	-36.615 (33.554)
High level of education			
Kernel	0.01	0.059 (0.023)*	-34.0255 (26.990)
	0.001	0.059 (0.033)	-34.025 (26.060)
Radius	0.01	0.059 (0.030)	-40.593 (30.704)
	0.001	0.039 (0.032)	-46.397 (37.730)

B = observed regression coefficients with bootstrap standard errors in parenthesis; *** $p<0.001$, ** $p<0.01$, * $p<0.05$.

Source: Young in Norway Longitudinal Study

Table A 11 : Average treatment effect on the treated (being early unemployed) for the unemployment and wage scarring among those with low and high levels of parental education over time

Matching methods	Caliper	Outcomes - B(SE)	
		Unemployment scarring	Wage scarring (income in 1000 NOK)
Low levels of parental education			
Kernel	0.01	0.083 (0.032)*	-71.072 (32.984)*
	0.001	0.083 (0.031)**	-71.072 (26.141)**
Radius	0.01	0.081 (0.034)*	-69.798 (48.680)
	0.001	0.091 (0.045)*	-55.378 (34.236)
High levels of parental education			
Kernel	0.01	0.083 (0.031)*	-29.324 (26.709)
	0.001	0.083 (0.034)*	-29.324 (17.946)
Radius	0.01	0.082 (0.030)**	-30.326 (33.629)
	0.001	0.087 (0.029)**	-43.719 (28.211)

B = observed regression coefficients with bootstrap standard errors in parenthesis; *** p<0.001, ** p<0.01, * p<0.05.

Source: Young in Norway Longitudinal Study

Table A 12 : Average treatment effect on the treated (being early unemployed) for the unemployment and wage scarring among those with low and high levels of mental distress over time

Matching methods	Caliper	Outcomes - B(SE)	
		Unemployment scarring	Wage scarring (income in 1000 NOK)
Low levels of mental distress			
Kernel	0.01	0.081 (0.028)**	-34.215 (18.286)
	0.001	0.082 (0.025)**	-34.215 (20.194)
Radius	0.01	0.082 (0.023)***	-34.690 (17.512)*
	0.001	0. 063 (0.032)*	-37.345 (24.854)
High levels of mental distress			
Kernel	0.01	0.089 (0.047)	-87.050 (60.537)
	0.001	0.089 (0.055)	-87.050 (49.791)
Radius	0.01	0.104 (0.074)	-73.154 (76.847)
	0.001	0.095 (0.075)	-52.976 (53.101)

B = observed regression coefficients with bootstrap standard errors in parenthesis; *** p<0.001, ** p<0.01, * p<0.05.

Source: Young in Norway Longitudinal Study

Table A 13 : Average treatment effect on the treated (being early unemployed) for the unemployment and wage scarring among those with and without problematic substance use behaviours over time

| | | Outcomes - B(SE) | |
		Unemployment scarring	Wage scarring (income in 1000 NOK)
Matching methods	*Caliper*		
Without substance use behaviours			
Kernel	0.01	0.068 (0.028)*	-51.963 (13.753)***
	0.001	0.068 (0.028)*	51.963 (14.327)***
Radius	0.01	0.069 (0.023)*	-48.063 (17.822)**
	0.001	0. 048 (0.031)	-40.789 (23.416)
With substance use behaviours			
Kernel	0.01	0.154 (0.060)*	-20.666 (46.142)
	0.001	0.153 (0.049)**	-20.666 (40.845)
Radius	0.01	0.154 (0.058)**	-16.795 (57.362)
	0.001	0.158 (0.071)*	-44.202 (70.510)

B = observed regression coefficients with bootstrap standard errors in parenthesis; *** $p<0.001$, ** $p<0.01$, * $p<0.05$.
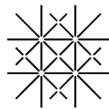
Source: Young in Norway Longitudinal Study

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