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Is overqualification a stepping stone for career progression among children of immigrants?

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ABSTRACT

Overqualification is one of the key labor market disadvantages that the children of immigrants born in the host society—the second-generation (G2)—disproportionately experience compared to the majority population. A higher prevalence of overqualification among the G2 may result from their strategic choice to circumvent persistent unemployment but also from the use of overqualification as a stepping stone into adequate employment —as predicted by career mobility theory. In light of this consideration, our paper investigates 1) to what extent overqualification and unemployment differently lead to career progression into adequately matched employment and 2) how this varies between the second-generation and majority populations. This study draws on Swedish register data on the total population and applies dynamic correlated random-effects multinomial logistic models to investigate year-to-year transitions across labor market states. Our results show that the chances of moving to adequate employment are higher for unemployed individuals than for overqualified workers. This result, which holds for both the majority population and G2 groups, is against the idea that overqualification serves as a stepping stone. We find that the chances of transitioning from overqualification and unemployment to adequate employment are higher for the majority population compared to most G2 groups. Although not the main focus of this paper, our analysis also provides evidence of higher risks for G2 overqualified workers to become unemployed and for G2 unemployed individuals to remain entrapped in unemployment. Together, these findings indicate a vicious cycle of career disadvantages for the G2.

1. Introduction

Children of immigrants born in the host society (the G2) face a number of challenges in labor markets across Europe. One key dimension where the G2 often experiences disadvantage compared to the majority population is the risk of being overqualified—having educational qualifications that exceed those required to perform the job held. While the evidence is mixed across countries and origin groups, elevated overqualification risks for G2 groups with non-European origin are consistently documented in the European context (Kim, 2024; Pineda-Hernández et al., 2025).

Overqualification is a disadvantageous labor market status because it is associated with wage penalties and slower wage growth (Korpi & Tåhlin, 2009) compared to workers with the same education level who are adequately matched. An open question is whether overqualification could serve as a stepping stone to adequately matched employment or a trap that depresses future career prospects. Career mobility theory (Sicherman & Galor, 1990) suggests that workers may intentionally choose positions for which they are overqualified in order to gain skills and labor market experience that can facilitate career progression and avoid persistent unemployment—which would offer worse opportunities for career development (Stiglitz, 2002).

While previous research generally does not provide supporting evidence for the stepping stone hypothesis, for the G2, the answer remains ambiguous. Racial and ethnic minorities, the G2 included, are known to face higher labor market disadvantages especially in getting a job compared to the majority population. Hiring discrimination against individuals with non-Western sounding names or appearance is prevalent across European labor markets (Carlsson, 2010; Heath et al., 2008; OECD, 2017; Quillian et al., 2019). Therefore, ethnic minorities might apply for jobs for which they are overqualified in order to compensate for discrimination by having a higher level of human capital compared

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to the majority co-applicants (Rafferty, 2020). If G2 workers who become overqualified are, on average, positively selected on characteristics relevant to career progression, such as motivation or ability relative to those who remain unemployed, overqualification could function as a stepping stone.

We therefore ask the following question: 1) Is the probability of transitioning to adequately matched employment higher from overqualification than from unemployment? And 2) to what extent does this differ between the majority population and G2 groups? Comparison between transition from overqualification and transition from unemployment to matched employment enables this study to test the stepping stone hypothesis especially regarding occupational mobility, which is an important yet often overlooked aspect of socioeconomic integration of the G2. Answering these questions requires modeling movements across three states—overqualification, unemployment, and adequately matched employment.

This study draws on Swedish register data on the total population to examine the labor market transitions of a large number of G2 groups and the majority Swedish population. We follow individuals from labor market entry (approximately age 25) over a ten-year window and apply dynamic correlated random-effects multinomial logistic models to estimate probabilities of transitioning across three labor market states: matched employment, overqualification, and unemployment.

In doing so, this paper makes several contributions to the literature on G2's labor market experiences. First, we examine a wide range of G2 origin groups characterized by varying degrees of labor market barriers. For example, previous research has consistently shown that G2 individuals of Middle Eastern and African origins in Western and Northern Europe are particularly disadvantaged in the labor market compared to those of European origin (Aradhya et al., 2023; Kim, 2024; OECD, 2017). Second, high-quality register data and advanced methods allow us to adjust for various confounding factors that previous research has often overlooked. Finally, our modeling strategy considers all potential transitions to and from overqualification, unemployment, and adequately matched employment. Earlier studies on testing the stepping stone hypothesis often focused on the transition between unemployment and overqualification, overlooking multiple possible paths to and from overqualification (Baert et al., 2013; Esposito & Scicchitano, 2022; Mavromaras et al., 2015). This leads to a crucial knowledge gap, as state dependence in overqualification and unemployment may differ between G2 individuals and the majority population, reflecting the distinct labor market barriers each group faces (Aradhya et al., 2023; Joona et al., 2014). While the core of this paper focuses on comparing the transitions from overqualification and unemployment to matched employment, the results of the other transitions are informative for contextualizing our results, especially for understanding where overqualified and unemployed workers who do not reach matched employment end up, and for accounting for state dependence across all labor market states simultaneously.

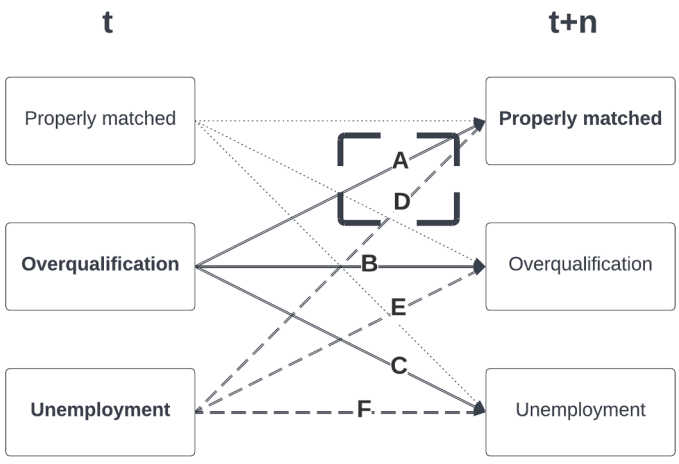

Fig. 1. Transitions across adequately matched employment, overqualification, and unemployment between two points in time t and $t + n$.

Our results indicate that overqualification does not serve as a stepping stone compared to unemployment since the probability of transitioning to adequately matched employment is higher among the unemployed than the overqualified – this result is in line with the idea that overqualification is a trap rather than a stepping stone for career progression. This finding holds for women and men. We observe heterogeneity across groups: G2 individuals, notably with Turkish and Middle Eastern and North African (MENA) origin, experience higher risks of transitioning from overqualification into unemployment and remaining persistently unemployed over time than the majority group. Our study also suggests that past overqualification and unemployment increase the risk of disadvantageous labor market outcomes, generating a vicious cycle of accumulating labor market disadvantages over the career.

1.1. Overqualification and career mobility

The potential advantage of overqualification to career progression was primarily expressed by Sicherman and Galor (1990). According to career mobility theory, an employment spell of overqualification is an investment in work experience that improves prospects for advancement to higher positions inside or outside the firm. The idea that overqualification brings relative advantages for the subsequent career was framed as the *stepping stone hypothesis* in later studies (e.g., Scherer, 2004).

In order to address the stepping stone hypothesis and heterogeneities therein, we examine all possible transitions across adequately matched employment, overqualification, and unemployment.[1] Fig. 1 represents all labor market transitions that this study examines and illustrates the hypotheses we test in this paper. Given the premises of the paper, in order to answer our research questions, we focus on the upward mobility transitions from overqualification towards adequately matched employment (path A in Fig. 1); and from unemployment to adequately matched employment (path D).

We interpret the stepping stone hypothesis by specifically comparing the probabilities of following paths A and D and expect that A is greater than D if overqualification is a stepping stone. In other words, accepting a job for which a worker is overqualified provides better subsequent career progression than not having a job at all.

The choice of unemployment as the counterfactual for overqualification is grounded in both theoretical and substantive considerations. Career mobility theory frames overqualification as preferable to unemployment, arguing that the accumulation/maintenance of human and social capital while employed leads to higher job prospects over time. This contrasts with many of the disadvantages associated with being unemployed. First, human capital decay implies that an individual's skills are not used and kept up-to-date when a person is unemployed (Pissarides, 1992). Similar processes may take place among severely overqualified workers, however, at a much slower pace. Importantly, overqualified workers may also gain valuable work experience even though they are not actively using their education-related human capital. Second, weakening social contacts hamper career progression far more for unemployed individuals since they do not engage with employment-based networks that may provide information about potential job vacancies or other useful contacts (cf. Granovetter, 1977). Third, unemployment may provide a more negative signal about productivity and employability than overqualification (Baert & Verhaest,

[1] We introduce no specific expectations regarding underqualification (having fewer qualifications than are required for the job), as this represents a rather unusual scenario, and it is often considered to offer career advantages to ethnic or racial minority groups (Schaeffer et al., 2016).

2019; Stiglitz, 2002). Taken together, this suggests that overqualification may provide better chances for future career progression, which aligns with the stepping stone hypothesis—path A is likely to be greater than path D.

Substantively, the comparison between overqualification and unemployment also reflects a practically relevant choice faced by job seekers, especially around labor market entry, who must decide whether to accept a mismatched job for its potential long-term mobility benefits or hold out for a position commensurate with their qualifications. We acknowledge that this operationalization does not capture all dimensions of the stepping-stone debate, especially whether overqualified workers can close the earnings gap with peers who entered matched employment (Korpi & Tåhlin, 2009). Yet, this operationalization focuses on one specific dimension of occupational mobility, namely having a job in line with one's educational level, which is an important yet often overlooked aspect of socioeconomic integration among the G2.

Existing literature so far has not provided solid evidence in favor of overqualification as a stepping stone. Some of the inconsistencies in existing research are related to whom overqualified workers are compared, i.e., individuals in the same occupation who are matched or individuals with the same level of education who are matched. For example, while overqualified workers do experience considerable mobility towards better labor market outcomes over their career, they are not able to close the disadvantage associated with initial poorly-matched employment compared to those with the same education who are matched (Scherer, 2004). Other longitudinal studies found that overqualified workers reported lower relative wage growth compared to adequately matched workers with the same level of qualifications (Korpi & Tåhlin, 2009). Their sluggish wage growth is likely due to their entrapment into overqualification, i.e., state dependence (Mavromaras & McGuinness, 2012). In addition, a number of recent studies have reported that overqualified workers may even experience higher risks of becoming unemployed compared to their adequately matched counterparts (Esposito & Scicchitano, 2022; Mavromaras et al., 2015) and that overqualification does not provide better chances for career progression, i.e., moving to adequately matched employment compared to remaining unemployed (Baert et al., 2013; Meroni & Vera-Toscano, 2017). There might be reasons why overqualified workers are less likely to move to matched employment than unemployed individuals (Holzer, 1987). For example, they can remain trapped in overqualification because they may adapt to the current position and subsequently reduce job search intensity compared to the unemployed. This may suggest that unemployed individuals have higher job search intensity leading to them getting a job and a matched one.

Importantly, existing evidence that does not find support for the stepping stone hypothesis focuses exclusively on the average effects of overqualification. Namely, it is largely unknown how overqualification and unemployment lead to career progression among groups characterized by severe labor market disadvantage, i.e., the G2. In fact, as discussed above, it is possible that overqualification serves as a stepping stone for those groups that encounter high barriers to finding a job and have a high likelihood of experiencing persistent unemployment. To our knowledge, there is no previous research investigating these heterogeneities.

1.2. Overqualification and the second generation

The G2 shows a misalignment between educational and labor market outcomes in many European countries. On the one hand, over time, there has been a notable convergence between the G2 and the majority population in terms of educational performance and attainment, with even higher educational aspiration among the G2 relative to the majority population (Borgen & Hermansen, 2023; Jackson et al., 2012; Jonsson & Rudolphi, 2011). On the other hand, however, the G2 has consistently poorer labor market outcomes, e.g., higher unemployment rates and lower occupational prestige, compared to the majority population (Drouhot & Nee, 2019; Heath et al., 2008; OECD, 2017). Importantly, while some migrant groups are able to close the gap with the majority population over time and across generations, others experience little to no convergence—a process known as segmented assimilation (Portes & Zhou, 1993).

While the G2's overqualification risk is considerably lower than that of first-generation immigrants (Khoudja, 2018; Larsen et al., 2018), it remains elevated relative to the majority population — particularly among G2 groups with non-Western backgrounds (Falcke et al., 2020; Kim, 2024). This persistent gap reflects the intersection of relative educational advancement and continued labor market disadvantage that characterizes some G2 groups' position in Western Europe.

One possible explanation behind the higher risk of overqualification among the G2 than the majority is related to disadvantages in getting a job. This disadvantage may lead G2 groups to broaden their job search and disproportionately apply for jobs for which they are overqualified as a strategy to compensate for hiring discrimination and thus avoid persistent unemployment (Pager & Pedulla, 2015). As such, overqualification may serve a unique purpose for the G2 in the labor market since having a job may be a better signal to future employers than having no job at all, i.e., remaining unemployed (Baert & Verhaest, 2019). In other words, overqualification may serve as a stepping stone to adequate employment, especially for the G2.

The overwhelming evidence, based on average effects, shows that overqualification does not serve as a stepping stone (Baert et al., 2013; Mavromaras et al., 2015). However, average effects mainly reflect the conditions for the majority and might mask substantial heterogeneity. Specifically, there might be heterogeneous effects if overqualification among the majority population is driven by different factors compared to the G2. The existence of unequal barriers in the labor market helps to generate some clear expectations regarding why overqualification may serve as a stepping stone for the most disadvantaged groups but not so for the majority population. The majority population does not experience labor market disadvantages related to discrimination and, on average, have access to higher quality networks than those with migrant backgrounds; overqualification is likely related to negative selection based on observed and unobserved characteristics. Unlike the majority population, the G2 are exposed to employer discrimination and likely, on average, have access to less advantageous networks meaning that they may not have access to the information that allows them to find jobs for which they are adequately matched (Kracke & Klug, 2021; Roth & Weißmann, 2022). These disadvantages may affect their employment choices and possibilities. First, fatigue due to a strenuous job search process may lead to lower reservation wages. As such, the G2 may be more likely to apply to and accept jobs that are not commensurate with their educational qualifications (Deschacht & Vansteenkiste, 2021). Second, the G2 may adapt their job search methods in response to high employer discrimination. The G2 searches more broadly compared to the majority population and with a higher degree of uncertainty such that they are more likely to accept any job at the expense of waiting for an adequately matched employment offer (Pager & Pedulla, 2015). Accordingly, we expect overqualification to function as a strategy through which a broader share of the G2, relative to their majority peers, can circumvent disadvantages, with the work experience they accrue translating into greater career mobility compared to G2 individuals who remain unemployed.

However, a number of mechanisms may also limit the stepping stone potential of overqualification for G2 workers. First, returns to work experience signals may differ between social groups: drawing on discriminatory stereotypes (Carlsson, 2010), employers may discount work experience accumulated by G2 workers in overqualified positions, perceiving it as reflecting constrained choice rather than ability (Pedulla, 2020). Second, once employed — even if overqualified — G2 workers may reduce job search intensity to a greater extent than the majority population, given the comparatively higher barrier they face to finding any employment (Aradhya et al., 2023), making them more

likely to remain in the same position. Third, overqualified G2 workers may be more likely to sort into sectors and occupations with limited upward mobility where returns to human capital accumulation that career mobility theory emphasizes are smaller due to limited transferability (Pissarides, 1992). Together, these mechanisms suggest that the stepping-stone potential of overqualification may be weaker for the G2 than for the majority population, and they may offset the stepping-stone advantage predicted by the weaker negative selection argument outlined above. To test whether the stepping-stone hypothesis is relevant for the most disadvantaged groups, we examine paths A and D across several G2 groups and the majority population.

1.3. The case of Sweden

Sweden is an interesting context for studying how overqualification and unemployment affect the career prospects of the G2. First, the share of G2 among the Swedish population has grown from 9.6 % to approximately 15 % over the last two decades (Statistics Sweden, 2025), and the share of G2 in the labor force is expected to gradually increase in the coming years. Second, Sweden boasts a comparatively highly educated workforce — partly because in Sweden, higher education is publicly funded with no tuition fees, and most students are eligible for student allowance (European Commission, 2023). Therefore, higher education contributes to equalizing labor market inequalities associated with parental socio-economic background. Third, strong trade unions and collective agreements result in strict employment protection legislation. Furthermore, trade unions are also heavily involved in the provision of unemployment benefits, which feature voluntary unemployment insurance subsidized by public authorities, sometimes referred to as the *Ghent system* (Van Rie et al., 2011). However, labor market institutions may also contribute to exacerbating the disadvantages that G2 faces. For instance, Sweden enforces last-in, first-out rules by law, under which workers are laid off based on their seniority. Since the G2 population often has shorter tenures, they are at a higher risk of becoming unemployed, elevating their overall employment insecurity (see Grotti et al., 2026). Moreover, the Swedish labor market has recently witnessed a segmentation process between highly protected permanent employees and less regulated temporary employees, implying that employment insecurity may be more widespread among the marginalized groups in the labor market (Berglund et al., 2023). Moreover, empirical evidence suggests that accepting low-quality employment, such as non-permanent contracts, as a temporary strategy in anticipation of future occupational upgrading may yield limited returns, even relative to other Nordic labor markets (Berglund et al., 2023). While not all overqualified positions involve non-permanent contracts, this evidence suggests that the stepping-stone potential of overqualification may also be more limited than often assumed in other contexts. Fourth, Sweden has been ranked as the most favorable country in Europe in terms of policies promoting immigrant integration (Yavçan & Gorgerino, 2025). However, a recent comparative study highlighted that Sweden, along with other Nordic countries, is characterized by the double penalty model — a significant penalty in both unemployment and overqualification among migrant workers — which indicates a gap between the overall assessment of integration policy and the reality (Pricila Birgier & Cantalini, 2024).

Finally, the Swedish labor market features a high rate of women's participation in the labor market compared to other high-income countries (OECD, 2023). Yet, Sweden also shows a substantial level of gender segregation in occupation and sectors compared to other European Union member states (European Commission & Directorate-General for Justice and Consumers, 2019). Given these patterns, it is important to examine whether labor market transitions differ between women and men. We do not advance specific hypotheses about gender differences but rather include them as an empirical dimension of our analysis. Therefore, it is crucial to encompass the female labor force in this study and explore potential differences in the labor market transitions between women and men.

2. Data, sample, and variables

2.1. Data

This study used a collection of Swedish registers providing longitudinal individual-level data on demographic and socioeconomic characteristics. Subsequently, we linked individuals to their parents to identify the parents' country of birth, as well as their socioeconomic characteristics (see Ludvigsson et al., 2016 for information on Swedish register data).

The study population included 196,875 men (1,943,015 person-years) and 194,438 women (1,768,706 person-years) born in Sweden between 1977 and 1981 who received at least upper secondary education.[2] We excluded those who did not receive upper-secondary education because they are unlikely to experience overqualification (Jacobs et al., 2020) and account for only a small share of the Swedish-born population. We followed them from age 25, or since they transitioned from education to the labor market, to the age of 39. Due to this sample selection, we focused on the period from 2002 to 2016. The lower age limit of 25 was chosen to exclude the ages at which individuals were likely still in full-time education. Furthermore, we limited the study data to spells[3] in which the individual participated in the labor market, defined as registering positive labor earnings or being registered as unemployed in the public employment office. The spells in education (measured by the occurrence of non-zero student allowances, 392,393 person-years), long-term illness (measured by the occurrence of non-zero long-term sickness benefit, 24,370 person-years), other forms of inactivity (247,540 person-years), and employment without a registered occupational code (measured by missing in occupational classification code in the occupation register, 244 person-years), were also excluded. The exclusion of the employed with missing occupations and inactive individuals was necessary because of this study's focus on unemployment and overqualification. However, inactive individuals may transition to employment or unemployment and thus enter the analytical population, while employed and unemployed individuals may transition to inactivity, thus exiting the analytical sample.

2.2. Overqualification and unemployment measure

Our outcome was employment status, which distinguishes between employed as matched, employed as overqualified, and unemployed. We measured overqualification following the Realized Matches method (RM, Verdugo & Verdugo, 1989), which defines overqualification as having higher years of schooling than the modal years of schooling that workers in the same occupation block have. We chose the RM method over other alternatives such as job analysis or worker's self-assessment method for two reasons: first, the RM method is appropriate for a research design focusing on a single country and provides reliable measures without substantial economic structural changes or high levels of credential inflation (Capsada-Munsech, 2019). Second, the RM method is suitable for comparing relative differences across study groups. We calculated the modal value of years of schooling within an occupation block, defined by four digits of occupational codes largely corresponding to the Swedish Standard Classification of Occupations (*Standard för svensk yrkesklassificering,* SSYK4), and by year, age, and gender to adjust for compositional factors. SSYK4 largely corresponds to the International Standard Classification of Occupations (ISCO) 88 (between 2001 and 2013) and ISCO 08 (from 2014). Since our study is mainly interested in overqualification, those who were adequately

[2] We included those who received upper secondary education but did not receive a degree.

[3] In this study, the unit of each spell is a person-year.

matched and underqualified were combined into one category. As such, an employed individual in a given year was classified either as *overqualified* or *matched*.

For a robustness check, we used an alternative operationalization of overqualification using the same RM method but replacing the mode with the mean years of education. With this measure, overqualification is defined as having years of education exceeding one standard deviation above the mean years of education within a given occupation block, adjusted for year, age, and gender. The share of overqualified workers is known to be estimated lower when applying the mean-based method to Swedish register data (Joona et al., 2014; Kim, 2024). Consequently, the robustness check results showed differences in transition probabilities related to overqualification. Nonetheless, the overall conclusion regarding transitions from overqualification and unemployment to matched employment held for both men and women (see Table A7 in the appendix).

We defined an individual as unemployed during a given year if they was registered in the public employment office (Arbetsförmedlingen) as unemployed for 90 days or more—irrespective of whether the days of unemployment were consecutive. Conversely, a person was regarded as employed if they had been registered for less than 90 days and received any labor earnings. This measure generates comparable unemployment rates as those derived from the Labor Force Survey (LFS) and used in official statistics (cf. Aradhya et al., 2023). As robustness checks, we conducted analyses using different cut-offs defining individuals as unemployed, such as 60 and 120 days. While there existed differences across cut-offs in unemployment rates, we found similar patterns in the associations between previous and current labor market participation states for men and women (see Tables A3 and A4 in the Appendix for more information).

2.3. Second-generation and origin classification

We defined second generations as native-born to at least one foreign-born parent. We included a variable to identify the 2.5 generations (G2.5), i.e., one parent was born abroad while the other was born in Sweden. Origin is defined as the father's country of birth because G2 children more likely take the father's surname, and the surname is associated with ethnic identity in the Swedish context (Bursell, 2012). In the case of G2.5, the origin followed a foreign-born parent's country of birth. We distinguished between 10 ancestries: Sweden, Finland, Other Nordic, Other Western (including both European and non-European Western countries, such as the United States and Australia), Eastern Europe, Yugoslavia and Bosnia, Southern Europe, the Middle East and North Africa (MENA), Turkey, and Other Non-Western (see Table A5 in the Appendix for more information). While the origin classification primarily followed broad geographical areas, we also identified specific origin groups with unique integration experiences in Sweden. For instance, Finnish migrants have a long immigrant history in Sweden, and the first-generation Finns were relatively well integrated into the labor market. Furthermore, many of them came from a Swedish-speaking ethnolinguistic minority population in Finland (Saarela & Scott, 2017). Meanwhile, integration into Swedish society was more challenging for groups such as those of Turkish origin (Bayram et al., 2009).

2.4. Control variables

We controlled for several characteristics likely to be associated with the transition between overqualification and unemployment dynamics in the different groups. The time-varying controls included age (also including age squared); educational attainment, divided between upper secondary (vocational or academic) and post-secondary (vocational or university). We also controlled for marital status (non-married, married, and divorced), which has been known to affect the length of the unemployment spell (Teachman et al., 1994), and for the number of children below 8 years of age (none, one, two, and three or more children), as the presence of young children may influence job search intensity, especially for women. Marital status and the number of children might also affect mobility constraints associated with higher risks of overqualification (McGoldrick & Robst, 1996). Finally, we included a measure of individual health conditions proxied by whether they had received any sickness benefit in the previous year ($t-1$). We used the past recipiency of sickness benefits to avoid reverse causality between health and overqualification (Madsen & Kittelsen Røberg, 2021).

The time-constant controls included academic performance (standardized grade point average (GPA) at age 16) in order to capture human capital and the years since completing education (when the highest educational level is achieved), which indirectly captured work experience before entering the analytic sample. Depending on individual trajectories between completing education and labor market entry, this measure may not accurately reflect actual labor market experience. However, in the absence of a more direct measure of work experience in the study data, we used it as a proxy, following previous research (Aradhya et al., 2023).

We also controlled for field of study (of the highest education achieved), which was used to capture individual preferences regarding the occupation and sector in which individuals decided to select into and distinguish between General education; Teaching methods and teacher education; Humanities and arts; Social sciences, law, commerce, administration; Natural sciences, mathematics and computing; Engineering and manufacturing; Agriculture and forestry, veterinary medicine; Health care and nursing, social care; and Services. In addition, we controlled for parental socio-economic status (SES), which could affect the index person's educational choices and proxy the size and quality of networks that can be used for searching for employment (Pedulla & Pager, 2019). We defined parental SES as parental occupation measured in 1990. We followed the dominance criteria and took the highest occupation of the mother and father. It distinguished between farmers, unskilled, low-skilled, medium-skilled, high-skilled and professionals, self-employed, not employed, and those with missing information. Finally, we controlled for the region of residence at the NUTS 2 level (8 categories) and year dummies.

3. Methods

We used a correlated dynamic random-effects multinomial logit model. This dynamic specification models every possible transition from the past ($t-1$) to the current status in the labor market between two consecutive years, thus assuming a first-order Markov process. There are two challenges to estimating the unbiased (genuine or causal) probability of each transition: first, unobserved heterogeneity correlated with the outcome (Heckman, 2007); and second, the so-called initial condition problem—according to which the initial period y_{i0} that is observed may not be the period in which the stochastic process causing the observed outcome begins.

Previous literature has suggested several different approaches to solving these issues (Biewen, 2009; Heckman, 1981; Rabe-Hesketh & Skrondal, 2013; Wooldridge, 2005). We employ the recent approach developed by Rabe-Hesketh and Skrondal (2013) because it offers parsimonious yet flexible solutions that can be implemented with unbalanced panel data.

We first define the individual-specific vector of the labor market participation state in the previous period ($t-1$) as follows:

$$\Omega_{it-1} = \left[y_{i,m,t-1}, y_{i,o,t-1}, y_{i,u,t-1} \right]$$

where each variable $y_{i,j,t-1}$ represents one of j different outcome states (with j = matched (m), overqualified (o), or unemployed (u)) for unit i ($i = 1, \ldots, N$) at time t. We model our outcome using the logistic distribution. Thus, the dynamic model that we estimated is specified as follows:

$$P(y_{it}^{*}=j|\ \Omega_{it-1},\quad Z_{it},X_i,\quad c_i,\quad u_{it}) = \frac{\exp(\gamma Z_{it}+\delta X_i+\beta y_{it-1}*X_i+c_i+u_{it})}{1+\sum_{j=1}^{K}\exp(\gamma Z_{it}+\delta X_i+\beta y_{it-1}*X_i+c_i+u_{it})} \quad (1)$$

where y_{it}^{*} represents one of j different labor market participation state for unit i ($i = 1, \ldots, N$) at time t. It is a function of a set of time-varying explanatory variables Z_{it} which are considered exogenous, conditional on the unit-specified unobserved effect c_i. β, the parameter for y_{it-1}, denoting one of j different labor market participation state for unit i at the previous year ($t-1$), captures genuine state dependence of each labor market participation state and it is interacted with origin (X_i) in our model. Finally, u_{it} represents an idiosyncratic error term.

The unit-specific unobserved effect c_i is expressed as

$$c_i = \alpha_0 + \alpha_1 y_{i0} + \alpha_2 \overline{Z_i} + \alpha_3 Z_{i0} + a_i \quad (2)$$

where y_{i0} and Z_{i0} stand for the initial values of the outcome of interest and of the time-varying explanatory variables, respectively. We control for $\overline{Z_i} = \frac{1}{T}\sum_{i=0}^{T} Z_{it}$, which denotes the within-unit averages of the time-varying explanatory variable. The time-varying variables we rely on to capture unobserved heterogeneity include age, marital status, total number of children under 8, and one-year-lagged health problems. Finally, $a_i \overset{\text{i.i.d.}}{\sim} N(0,1)$ is a unit-specific time-constant error term, assumed to be independent of the idiosyncratic error term u_{it} (Rabe-Hesketh & Skrondal, 2013).

Under the assumption that unobserved heterogeneity is absorbed by c_i, the parameter β measures either genuine state dependence when individual i stays in the same outcome category ($y_{ijt} = y_{ijt-1}$) or genuine probability of transition if the individual i changes her state ($y_{ijt} \neq y_{ijt-1}$) —that is the causal effect exerted by the labor market participation state in the previous year on the labor market participation state in the current year. Based on the above equations, the model is estimated as a standard random-effects (RE) multinomial logit model, using *xtmlogit* in STATA 18. All analyses are conducted separately for men and women to capture potential differences in transitions between labor market states, which arise from the pronounced gender segregation across occupations and sectors. Furthermore, this approach allows us to incorporate an intersectionality perspective, capturing how gender and immigrant background interact to shape labor market outcomes for G2 women (Acker, 2006).

4. Results

4.1. Descriptive findings

Table 1 presents descriptive statistics for the study population. The G2 represents 14 %, while majority Swedes make up the remaining 86 % of the population. The proportion of G2 groups among the study population for men is similar to that for women. Overall, individuals are followed up between 11.0 (G2 Other Non-Western women) to 12.3 years (G2 Yugoslavian/Bosnian men). These differences are related to variations in age at labor market entry. Results for men show a similar pattern, although men enter the labor market earlier and thus are followed up for a longer period.

The fifth column reports the unemployment rate for each group. The overall unemployment rate during the period 2002–2016 was 5.3 % for women and 5.6 % for men. There exist differences across origin groups. Among women, majority Swedes have the lowest unemployment rate at 5.0 %, while all other origin groups show higher rates. Majority Swedish men's unemployment rate is similar to that of women (5.2 %), with less variation in unemployment rates among men across origin groups.

The last column shows overqualification rates for each group. The overall overqualification rate during the study period was 18.1 % for women and 17.4 % for men. Unlike unemployment, majority Swedish women and men do not show the lowest overqualification rates among origin groups. Instead, G2 Finnish, Other Nordic, Former Yugoslavian/Bosnian, and Turkish women and men show lower overqualification rates compared to other groups. These results indicate that overqualification risks vary across origin groups but not in a pattern that corresponds to differences in unemployment rates.

4.2. Overqualification, unemployment, and upward career mobility

Fig. 2 presents average predicted probabilities for women transitioning from overqualification at time $t-1$ to any labor market state at t which are adequately matched employment, overqualification and unemployment. Fig. 3 is similar to Fig. 2 but presents transition probabilities for those who are unemployed at time $t-1$. We present the

Table 1
Descriptive statistics of individuals born between 1977 and 1981 in Sweden, followed up between 2002 and 2016, separate for women and men.

Women	N. individuals	Size (%)	Mean N years	Mean age at LM entry	Unemployment rate	Overqualification rate
Sweden	170,770	86.1	11.9	22.2	5.0	18.1
Finland	10,348	5.0	11.9	21.6	6.8	16.7
Nordic	3459	1.7	11.9	21.6	7.1	15.4
Other Western	3589	1.7	11.5	22.4	5.7	20.4
East-EU	2608	1.2	11.5	22.4	7.4	21.0
Yugoslavia/Bosnia	2305	1.1	12.0	21.3	8.7	16.2
South-EU	1840	0.8	11.5	21.8	7.2	18.8
MENA	1402	0.6	11.4	21.7	9.3	19.2
Turkey	1511	0.8	12.0	20.8	11.4	12.3
Other	2396	1.0	11.0	22.4	8.3	20.4
Total	200,228	100	11.9	22.2	5.3	18.1
Men						
Sweden	173,330	86.4	12.2	21.6	5.2	17.4
Finland	10,060	4.9	12.2	21.0	7.8	14.5
Nordic	3428	1.6	12.1	21.1	7.6	14.5
Other Western	3591	1.6	11.9	21.8	6.2	20.4
East-EU	2727	1.2	11.7	22.1	7.6	20.0
Yugoslavia/Bosnia	2301	1.1	12.3	20.9	9.1	15.4
South-EU	1864	0.9	11.9	21.4	8.8	16.7
MENA	1401	0.6	11.5	21.6	9.3	18.4
Turkey	1242	0.6	12.0	20.8	9.4	14.5
Other	2483	1.1	11.4	21.7	8.5	20.7
Total	202,427	100	12.2	21.5	5.6	17.3

Note: Unemployment and overqualification rates refer to the share of person-years spent in each state by origin group and sex.

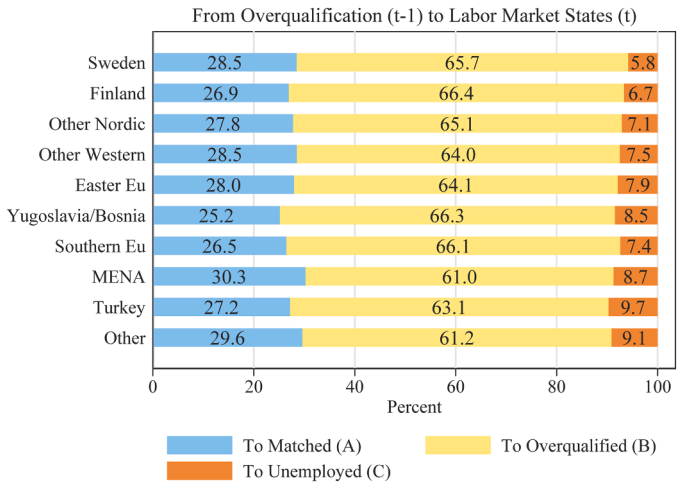

Fig. 2. Predicted probability of transitioning from previous overqualification (t–1) to labor market states (t) for women, estimated from the correlated random-effects dynamic multinomial logit model.

results for women because the findings for men are largely similar, allowing for a more concise focus. However, we highlight key differences between women and men throughout the analysis. The full results for men are available in Appendix Figures A1 and A2.

The probability of transitioning from overqualification to adequate employment (denoted as A in Fig. 2) is lower than that of transitioning from unemployment to adequate employment (denoted as D in Fig. 3) for all G2 groups and majority Swedish women. In fact, on average, less than 30 % of overqualified workers transition to adequately matched employment, while roughly 60 % of unemployed individuals make the same transition. In all origin groups, unemployed individuals are nearly twice as likely to move to matched employment compared to overqualified workers. This result indicates that overqualification does not provide better chances for career progression in terms of moving to adequately matched employment. The results for men lead to the same conclusion, although the probability of transitioning to adequate employment among unemployed men is greater than that of unemployed women for most groups (see Figure A1). Meanwhile,

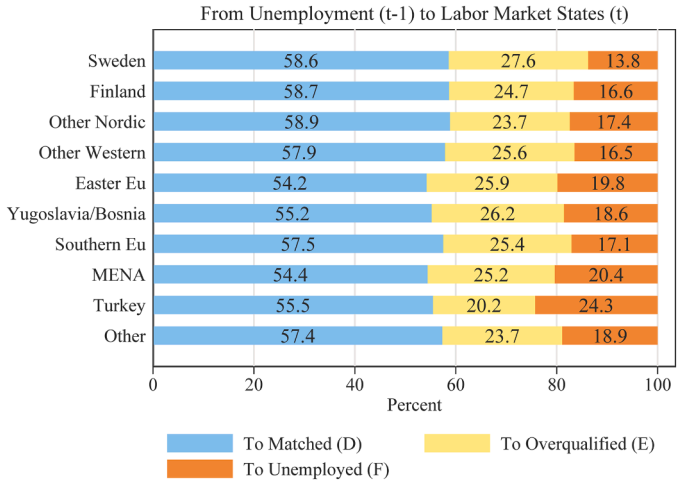

Fig. 3. Predicted probability of transitioning from previous unemployment (t–1) to labor market states (t) for women, estimated from the correlated random-effects dynamic multinomial logit model.

overqualified women's probability of transitioning to adequate employment is usually higher than that of overqualified men across origin groups. This confirms that overqualification does not serve as a stepping stone, not even for the most disadvantaged groups, since pathway D is greater than pathway A (referring to Fig. 1). These findings are in line with previous research (Baert et al., 2013; Meroni & Vera-Toscano, 2017).

There are, however, some notable differences in the transition probabilities A and D between the majority Swedish population and G2 groups. While most groups of G2 women report lower probabilities of transitioning from overqualification to adequately matched employment than Majority Swedish women (28.5 %), G2 MENA and Other Non-Western women report a higher probability of transitioning from overqualification to adequately matched employment, at 30.3 % and 29.6 %, respectively. Similarly, G2 Eastern European and MENA men report a higher probability of transitioning from overqualification to adequately matched employment (24.6 % and 25.2 %, respectively) compared to Majority Swedish men (24.1 %). Among the unemployed, these origin groups do not report higher probability of transitioning to adequately matched employment compared to their majority native counterparts (see Fig. 3 and A2).

Our results indicate that about 70 % of overqualified workers and 40 % of unemployed individuals fail to transition to adequate employment. This raises a key question: where do these individuals transition to? Fig. 2 also highlights high levels of overqualification persistence for all groups (denoted as B in Fig. 2). Overqualification persistence ranges from 61.0 % to 66.4 %, meaning that more than 60 % of the overqualified female workers in one year remain overqualified in the subsequent year. While the level of overqualification persistence is similar across origin groups, G2 MENA and Other Non-Western report notably lower persistence compared to the majority native group. This is both explained by higher probability of transitioning to adequately matched employment and unemployment. The results for men show somewhat similar patterns: overqualification persistence of G2 groups are mostly weaker compared to the majority native population due to their higher probability of transitioning to unemployment.

Notable differences between the majority population and G2 groups are shown in highly unequal transition probabilities from overqualification to unemployment (denoted as C in Fig. 2), as well as unemployment persistence (denoted as F in Fig. 3). Majority Swedish women are much less likely to transition to unemployment from overqualification (5.8 %) compared to all other groups (up to 9.7 % among G2 Turkish women). This translates to a 3.9 percentage point advantage or roughly 67 % lower transition rates. Although relatively higher probability of transitioning to adequately matched employment is shown among a few G2 groups, overall findings suggest that instead of benefiting G2 groups, overqualification disproportionately disadvantages career progression by increasing their risk of unemployment.

Fig. 3 shows clear group differences in the probability of transitioning from unemployment to the other labor market states (denoted as D and E in Fig. 3). The figure presents three key findings. First, majority Swedish women are more likely to transition from unemployment to adequately matched employment (58.6 %) compared to all other groups, except for G2 Other Nordic women (58.9 %), whereas G2 Eastern European women display the lowest transition probability to adequately matched employment (54.2 %). The results for men show similar patterns, although men generally report higher probabilities of transitioning from unemployment to adequately matched employment than women with the same origin (see Figure A2). Second, we do not find support for the idea that overqualification is used as a strategy to achieve career mobility among the G2. Specifically, the transition probabilities from unemployment to overqualification are the highest among majority Swedish women. Finally, our findings support previous research showing highly unequal unemployment persistence (denoted as F in Fig. 3) (Aradhya et al., 2023). Majority Swedish women report the lowest unemployment persistence (13.8 %), whereas G2 Turkish

women show the strongest unemployment persistence (24.3 %), followed by G2 MENA women (20.4 %). Taken together, unemployment is a more disadvantageous labor market state for G2 women, especially those with non-Western backgrounds, experiencing a lower probability of upward career mobility and stronger unemployment persistence in comparison to the majority Swedish women. The estimated unemployment persistence probabilities are similar between men and women for most origin groups, with only minor differences.

In addition, we compared the differences in D-A (the stepping stone gap) by origin group and sex (see Table A6 in the Appendix). For women, the D–A gaps were generally smaller among G2 groups, with G2 Other Western, G2 Eastern European, and G2 Other Non-Western women showing the most notable differences. Among men, the D–A gaps were more similar across origin groups with G2 Eastern European and G2 MENA men being exceptions.

These findings have important implications for heterogeneity in the effects of overqualification. Compared to unemployment, we find no support for the idea that overqualification serves as a stepping stone for G2 groups experiencing large barriers in the labor market. We found that some G2 groups with non-Western origin report higher probability of transitioning from overqualification to adequately matched employment compared to the majority population. Also, many G2 groups report compressed gaps between the transition probabilities of two upward mobility pathways, namely D and A in Figs. 2 and 3 . Yet, overqualification is also associated with a notably higher probability of becoming unemployed among these groups. Taken together, these results suggest that our expectation that overqualified majority Swedes would experience worse career progression than G2 individuals, due to stronger negative selection on observed and unobserved characteristics, receives little empirical support.

5. Discussion and conclusions

Although the G2 generally features better socioeconomic outcomes than immigrants (Drouhot, 2024), they still experience disproportionate labor market disadvantages compared to the majority population, overqualification being one important dimension. Overqualification is an indicator of low-quality employment since it is associated with lower returns to education and slower wage growth. However, at the beginning of this article, we argued that pursuing job opportunities for which one is overqualified may be a strategy the G2 applies to circumvent broader disadvantages (e.g., hiring discrimination) in the labor market that often leads to persistent unemployment. According to career mobility theory, an overqualified job may foster better long-term career prospects by functioning as a stepping stone to adequately matched employment compared to remaining unemployed. Since G2 individuals are less likely to be negatively selected into overqualification compared to the majority population, we argued that overqualified G2 individuals may be more likely to benefit from their overqualification spells, leading to a higher likelihood of career progression compared to the overqualified majority population. To date, no studies have examined how overqualification and unemployment affect the career progression of the G2 despite their notably higher levels of overqualification and unemployment than the majority population.

Drawing on Swedish total population register data, we investigated whether the probability of transitioning to adequate employment from overqualification is higher than that of transitioning from unemployment and whether this pattern differs between the majority Swedes and G2 groups of various ancestral origins.

Our study discovered that, from one year to the next, overqualified employees are less likely to transition to adequately matched employment compared to the unemployed. This finding contrasts with the predictions of the stepping stone hypothesis. Importantly, and contrary to our expectations, we found little evidence that overqualification facilitates career progression any more for G2 than for the majority population. In fact, our results indicate that overqualification is less detrimental to career progression for the majority Swedish population and more detrimental for G2 individuals with non-Western backgrounds, especially due to differential risks of transitioning to unemployment from overqualification. Additionally, our findings revealed that the overqualified are more likely to become unemployed, and the unemployed are more likely to become overqualified compared to adequately matched employees.

Our findings confirm earlier research suggesting that the stepping stone hypothesis does not hold (Baert et al., 2013; Meroni & Vera-Toscano, 2017). Moreover, we found that this hypothesis does not hold for G2 groups either. Among the overqualified, some G2 groups, especially those with non-Western origin, showed nuanced outcomes, with higher probabilities of moving into adequately matched employment, but also higher risks of becoming unemployed compared to the majority population. The nuanced outcomes may be partially explained by the fact that we included parental socioeconomic status and standardized GPA scores (observed time-constant confounders) and our modeling approach ideally also adjusts for other unobserved time-constant confounders that are related to differential selection into overqualification between the G2 and the majority population. Time-varying confounders related to this selection were not adjusted for by the model and may have shaped the results, but our findings indicate that the role of time-varying confounders is not large enough to create a strong pattern. We also cannot rule out the possibility that the advantages from less negative selection into overqualification among the G2 were offset by other potential disadvantages we mentioned earlier, e.g., stronger negative signals and changes in job search intensity, which would be an interesting avenue for future research.

Importantly, the relative advantage from higher probability of transitioning to adequately matched employment was exceeded by additional disadvantage from higher probability of transitioning to unemployment. The nuanced outcomes observed among non-Western G2 groups may also suggest that employers use periods of overqualified employment as a probationary screening phase — particularly for visible minority workers — sorting workers into adequate employment or unemployment based on observed performance. This pattern may therefore not fully reject the stepping-stone hypothesis, but instead point toward a conditional version of it: overqualification functions as a stepping stone only for those who survive employer screening. Further evidence on employer behavior and perceptions toward overqualified workers would be needed to confirm this interpretation. That said, our findings suggest that overqualification should not be viewed as a universally neutral or beneficial state, given that overqualified workers remain at elevated risk of transitioning into unemployment relative to those in adequately matched employment.

Moreover, even if there were no additional unemployment risk disadvantages among G2 individuals, overqualification is less beneficial compared to unemployment in terms of moving to adequately matched employment. Among the overqualified, the majority population has the most promising career prospects, and among the unemployed, they are least likely to accumulate further disadvantages in their career after experiencing overqualification. Another noteworthy implication of our

findings is that the relative disadvantages faced by G2 individuals, compared to the majority population, are particularly pronounced in relation to entering and remaining in unemployment (unemployment persistence). These disadvantages are stronger than those related to overqualification persistence or transitions from matched employment to overqualification. In other words, the overall career disadvantages among the G2 are largely driven by elevated unemployment risks and their persistence.

As discussed, our results do not support the idea that overqualification serves as a stepping stone either for majority Swedish or G2 groups. This raises the question: How do overqualification and unemployment fit into career progression? Figs. 2 and 3 display notable shares of overqualified women at time $t-1$ transit to unemployment (denoted as C) and from unemployment at time $t-1$ to overqualification (denoted as E). Importantly, the associated transition probabilities are larger than those from, respectively, adequate employment to unemployment and adequate employment to overqualification.

These findings support the idea of an interrelation between unemployment and overqualification – or a vicious cycle of labor market disadvantage. This aligns with previous research identifying vicious cycles between low-quality employment and unemployment that undermine career security for those who are already disadvantaged (Cappellari & Jenkins, 2008).

Our study provides important empirical evidence for research on career mobility theory and the stepping-stone hypothesis. First, our paper is the only study to examine heterogeneities in the stepping stone hypothesis for G2 groups and the majority population by examining a wide range of origin groups. Secondly, by examining all possible transitions between labor market states, we were able to consider not only upward but also downward mobility transitions from each labor market state. Together, these allowed us to show that the most important heterogeneity was related to overqualification as a labor market trap that is more commonly experienced among the G2. Not only did overqualification lead to lower transitions to adequately matched employment, but also to higher transition probabilities to unemployment. Finally, we were able to exploit high-quality register data to adjust for a wide range of confounding factors that previous research had been unable to account for.

Yet, our study comes with limitations. First, our measure of unemployment depends on the registered unemployment cases. Using registered unemployment information under the Ghent system is known to suffer from measurement error, especially for youth and immigrant populations. Although our unemployment measure provides unemployment rates comparable to official statistics from the Labor Force Survey (LFS) (Aradhya et al., 2023), it may misclassify actual job seekers as inactive, thus excluding them from the study population. Second, the RM approach has a few limitations. The RM method presumes that all relevant skills are acquired through formal education, a common limitation to all objective measures of qualification mismatch (Capsada-Munsech, 2019). This method is also likely to be influenced by credential inflation. However, our measure accounts for this issue by standardizing based on age and year to minimize misclassification due to credential inflation. Moreover, observation is limited to the selected birth cohort, so credential inflation is not likely to be a severe issue. Therefore, the RM method was the most suitable and feasible way to measure overqualification using the study data. Third, the dynamic correlated random-effects multinomial logistic regression models account for time-constant unobserved heterogeneity, thereby addressing selection into overqualification to the extent that it stems from stable individual characteristics. However, selection may also be due to time-varying unobserved heterogeneity, which this method does not capture beyond controlling for time-varying observables included in the model.

To conclude, our study suggests that the implementation of policy measures aimed at reducing both unemployment and overqualification would benefit the G2 not only in terms of alleviating their current disadvantages but also serving as a preventive measure against their accumulating labor market disadvantages over their careers. However, when devising policy interventions for improving labor market outcomes, it is crucial to consider the quality of employment, i.e., the alignment between skill levels and occupation. Urging unemployed individuals to accept low-skilled employment despite their potential overqualification may increase their risks of falling into unemployment again rather than serving as a means to advance towards better job opportunities. Most importantly, a policy lacking this specific focus risks widening labor market stratification, given that the negative consequence of poorly matched employment disproportionately disadvantages the G2.

CRediT authorship contribution statement

Wooseong Kim: Writing – review & editing, Writing – original draft, Visualization, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Raffaele Grotti:** Writing – review & editing, Visualization, Resources, Methodology, Investigation, Data curation, Conceptualization. **Siddartha Aradhya:** Writing – review & editing, Supervision, Resources, Investigation, Funding acquisition, Data curation, Conceptualization.

Declaration of Generative AI and AI-assisted technologies in the writing process

During the preparation of this work, the authors used Claude Sonnet 4.6 (Anthropic) in the writing process in order to improve the readability and language of the manuscript. After using this tool, the authors reviewed and edited the content as needed. The authors take full responsibility for the content of the published article.

Declaration of Competing Interest

The Authors report there are no competing interests to declare.

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Appendix

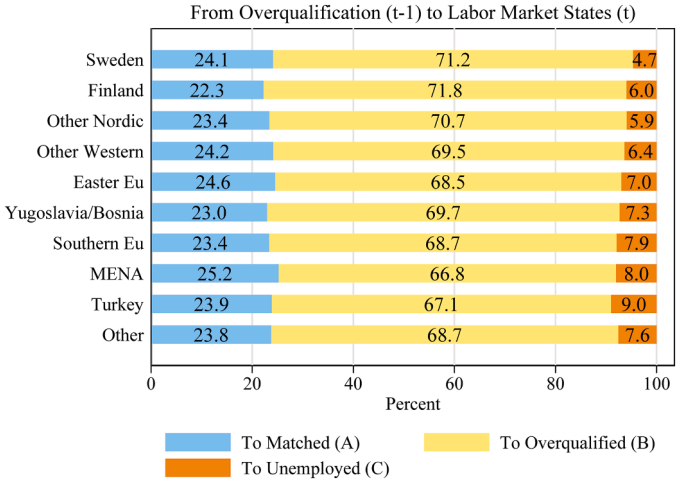

Fig. A1. The predicted probability of transitioning from current overqualification (t−1) to labor market states (t) for men, estimated from the correlated random-effects dynamic multinomial logit model controlling for age, education level, marital status, number of children under 8, sickness leave, GPA, education field, parentel SES, and region

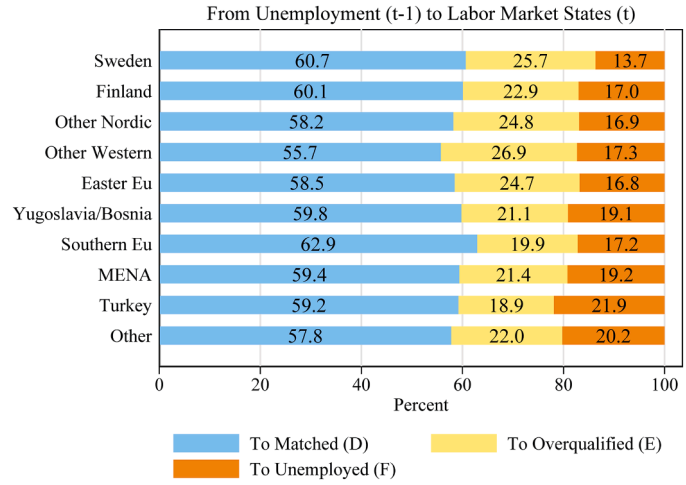

Fig. A2. The predicted probability of transitioning from current unemployment (t−1) to labor market states (t) for men, estimated from the correlated random-effects dynamic multinomial logit model with the same control variables as Figure A1

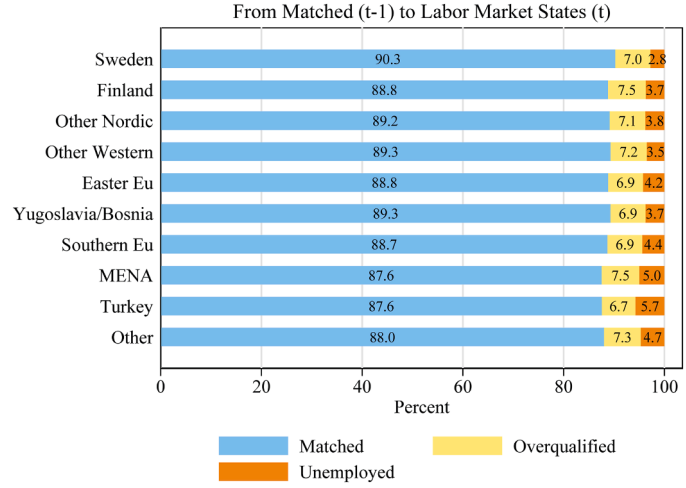

Fig. A3. The predicted probability of transitioning from current adequately matched employment (t−1) to labor market states (t) for women, estimated from the correlated random-effects dynamic multinomial logit model with the same control variables as Figure A1

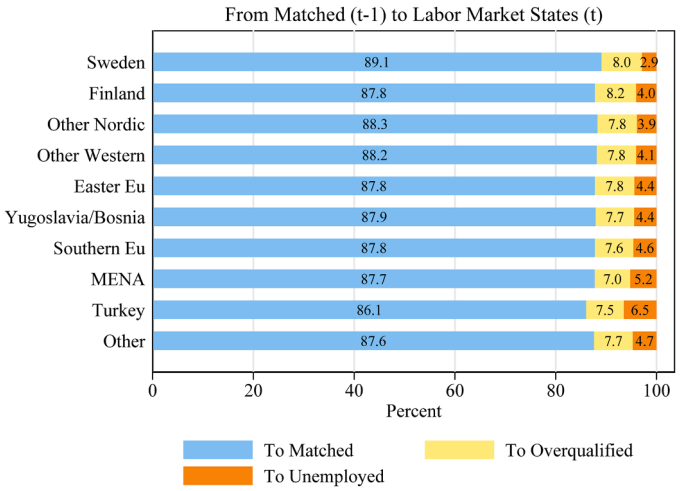

Fig. A4. The predicted probability of transitioning from current adequately matched employment (t−1) to labor market states (t) for men, estimated from the correlated random-effects dynamic multinomial logit model with the same control variables as Figure A1

Table A1
Effect of past labor market participation state (t−1) on current labor market participation state (t) by origin groups, for men. Correlated random-effects dynamic multinomial logit model with interaction between origin and past labor market participation status, RRR

	RRR	Std. err.	z	P > |z|	95% CI Low	95% CI Upp
Outcome=Overqualified (t)						
Overqualified (t−1)	78.09	0.68	502.49	0.00	76.77	79.43
Unemployed (t−1)	6.13	0.08	137.88	0.00	5.97	6.29
Ancestry (Ref. Sweden)						
Finland	1.04	0.03	1.41	0.16	0.99	1.09
Other Nordic	0.98	0.04	−0.47	0.64	0.91	1.06
Other Western	0.98	0.04	−0.50	0.62	0.91	1.06
Eastern Europe	0.99	0.04	−0.26	0.79	0.91	1.07
Yugoslavia/Bosnia	0.97	0.04	−0.80	0.42	0.89	1.05
Southern Europe	0.96	0.05	−0.73	0.47	0.87	1.07
MENA	0.88	0.05	−2.08	0.04	0.78	0.99
Turkey	0.96	0.06	−0.70	0.49	0.85	1.08
Other	0.97	0.05	−0.63	0.53	0.89	1.06
Previous state # Ancestry						
Overqualified # Finland	1.07	0.03	2.31	0.02	1.01	1.14
Overqualified #Other Nordic	1.04	0.05	0.75	0.45	0.94	1.15
Overqualified #Other Western	0.98	0.05	−0.47	0.64	0.88	1.08
Overqualified #Eastern Europe	0.93	0.05	−1.34	0.18	0.83	1.04
Overqualified #Yugoslavia/Bosnia	1.06	0.07	0.84	0.40	0.93	1.20
Overqualified #Southern Europe	1.01	0.08	0.18	0.86	0.88	1.17
Overqualification # MENA	0.97	0.08	−0.39	0.70	0.81	1.15
Overqualified #Turkey	0.95	0.09	−0.53	0.60	0.80	1.14
Overqualified #Other	0.98	0.06	−0.24	0.81	0.87	1.12
Unemployed # Finland	0.84	0.04	−3.48	0.00	0.76	0.93
Unemployed # Other Nordic	1.02	0.09	0.26	0.80	0.87	1.20
Unemployed # Other Western	1.19	0.10	2.05	0.04	1.01	1.41
Unemployed # Eastern Europe	1.00	0.10	0.02	0.99	0.83	1.21
Unemployed # Yugoslavia/Bosnia	0.82	0.08	−2.05	0.04	0.67	0.99
Unemployed # Southern Europe	0.72	0.09	−2.75	0.01	0.57	0.91
Unemployed # MENA	0.92	0.13	−0.62	0.53	0.70	1.20
Unemployed # Turkey	0.72	0.10	−2.37	0.02	0.55	0.95
Unemployed # Other	0.89	0.09	−1.12	0.26	0.73	1.09
Mixed (Ref. No)						
Yes	0.98	0.02	−0.95	0.34	0.94	1.02
Age	4.11	0.10	57.29	0.00	3.92	4.32
Age squared	0.98	0.00	−54.83	0.00	0.98	0.98
standardized GPA	0.94	0.00	−13.97	0.00	0.93	0.94
Civil status (Ref. Single)						
Coupled	1.01	0.01	0.74	0.46	0.99	1.03
Separated	0.93	0.03	−2.27	0.02	0.87	0.99
Health problems (t−1, Ref. No)						
Yes	0.94	0.01	−4.52	0.00	0.91	0.96
Number of children up to 8						
1	1.44	0.04	11.86	0.00	1.36	1.53
2	1.88	0.06	19.05	0.00	1.76	2.01

(continued on next page)

Table A1 (*continued*)

	RRR	Std. err.	z	P > |z|	95% CI Low	95% CI Upp
3 or more	2.36	0.10	20.86	0.00	2.18	2.56
Parental occupation (Ref. High skilled & professionals)						
Farmers	1.01	0.03	0.41	0.69	0.95	1.08
Unskilled	1.17	0.01	12.70	0.00	1.14	1.20
Low skilled	1.16	0.01	12.90	0.00	1.14	1.19
Medium-skilled	1.04	0.01	4.05	0.00	1.02	1.06
Self-employed	1.09	0.01	6.23	0.00	1.06	1.12
Missing	1.03	0.03	1.37	0.17	0.99	1.09
Not unemployed	1.01	0.03	0.28	0.78	0.95	1.07
Region (Ref. Stockholm)						
East Middle	1.13	0.01	10.93	0.00	1.10	1.15
South	1.13	0.01	11.29	0.00	1.11	1.16
North Middle	1.19	0.02	12.44	0.00	1.15	1.22
Middle Norrland	1.14	0.02	7.42	0.00	1.10	1.19
Upper Norrland	1.19	0.02	11.13	0.00	1.15	1.22
Smaland & islands	1.32	0.02	20.76	0.00	1.29	1.36
West	1.15	0.01	13.53	0.00	1.12	1.17
Year (Ref. 2003)						
2004	2.55	0.13	19.00	0.00	2.31	2.81
2005	1.57	0.08	9.30	0.00	1.43	1.72
2006	1.48	0.07	8.18	0.00	1.35	1.63
2007	2.66	0.13	20.08	0.00	2.42	2.93
2008	2.21	0.11	15.72	0.00	2.01	2.44
2009	1.98	0.10	13.02	0.00	1.79	2.20
2010	1.87	0.10	11.44	0.00	1.68	2.08
2011	1.94	0.11	11.66	0.00	1.74	2.17
2012	1.31	0.08	4.59	0.00	1.17	1.48
2013	1.25	0.08	3.64	0.00	1.11	1.41
2014	0.10	0.01	−35.21	0.00	0.09	0.12
2015	0.57	0.04	−8.35	0.00	0.50	0.65
2016	1.15	0.08	1.96	0.05	1.00	1.31
Field of education (Ref. General)						
Teaching methods and teacher edu.	1.86	0.04	28.35	0.00	1.78	1.94
Humanities and arts	1.55	0.03	23.38	0.00	1.50	1.61
Social sciences, law, commerce, admin.	1.55	0.03	26.60	0.00	1.50	1.60
Natural Sciences, maths & computing	1.63	0.03	23.86	0.00	1.56	1.69
Engineering and manufacturing	1.61	0.02	32.89	0.00	1.56	1.65
Agriculture and forestry	1.54	0.04	17.18	0.00	1.47	1.62
Health care, nursing, social care	0.91	0.02	−4.68	0.00	0.88	0.95
Services	1.21	0.02	10.99	0.00	1.17	1.26
Unknown	1.26	0.03	8.25	0.00	1.19	1.33
Education level (Ref. Upper secondary)						
Tertiary	4.22	0.05	112.66	0.00	4.11	4.32
Years from highest degree	1.02	0.00	12.66	0.00	1.02	1.03
Within-unit averages						
Marital status (Ref. Single)						
Coupled	0.91	0.02	−4.82	0.00	0.88	0.95
Separated	1.02	0.06	0.30	0.76	0.91	1.13
Health problems (Ref. No)						
Yes	1.73	0.06	14.74	0.00	1.60	1.85
Number of children up to 8 (Ref. None)						
1	0.57	0.04	−8.75	0.00	0.50	0.65
2	0.36	0.02	−16.41	0.00	0.31	0.40
3 or more	0.27	0.02	−16.51	0.00	0.23	0.32
age	0.95	0.01	−7.23	0.00	0.94	0.96
Initial condition (t = 0)						
Marital status (Ref. Single)						
Coupled	1.07	0.02	3.76	0.00	1.03	1.10
Separated	1.01	0.07	0.08	0.94	0.87	1.16
Health problems (Ref. No)						
Yes	1.01	0.02	0.42	0.68	0.98	1.04
Number of children up to 8 (ref. None)						
1	1.17	0.06	2.91	0.00	1.05	1.30
2	1.40	0.07	6.49	0.00	1.27	1.55
3 or more	1.52	0.10	6.60	0.00	1.34	1.72
age	0.96	0.00	−9.25	0.00	0.96	0.97
State (Ref. Matched employment)						
Overqualified	1.45	0.02	33.73	0.00	1.42	1.48
Unemployed	1.15	0.01	12.90	0.00	1.13	1.18
Outcome=Unemployed (t)						
Overqualified (t−1)	7.53	0.12	123.79	0.00	7.30	7.78
Unemployed (t−1)	11.02	0.15	176.07	0.00	10.72	11.31
Ancestry (Ref. Sweden)						
Finland	1.52	0.06	11.25	0.00	1.41	1.63
Other Nordic	1.44	0.08	6.16	0.00	1.28	1.62
Other Western	1.52	0.10	6.61	0.00	1.34	1.72

(*continued on next page*)

Table A1 (*continued*)

	RRR	Std. err.	z	P > |z|	95% CI Low	95% CI Upp
Eastern Europe	1.67	0.11	7.90	0.00	1.47	1.90
Yugoslavia/Bosnia	1.69	0.10	8.72	0.00	1.50	1.90
Southern Europe	1.76	0.13	7.67	0.00	1.52	2.04
MENA	2.08	0.17	8.81	0.00	1.76	2.44
Turkey	2.79	0.21	13.28	0.00	2.39	3.24
Other	1.84	0.12	8.95	0.00	1.61	2.10
Previous state # Ancestry						
Overqualified # Finland	0.98	0.06	−0.33	0.74	0.87	1.10
Overqualified #Other Nordic	0.97	0.10	−0.33	0.74	0.80	1.18
Overqualified #Other Western	0.97	0.10	−0.28	0.78	0.80	1.18
Overqualified #Eastern Europe	0.98	0.11	−0.22	0.83	0.79	1.21
Overqualified #Yugoslavia/Bosnia	1.11	0.12	0.93	0.35	0.89	1.38
Overqualified #Southern Europe	1.16	0.16	1.08	0.28	0.89	1.50
Overqualification # MENA	0.91	0.14	−0.58	0.56	0.67	1.24
Overqualified #Turkey	0.85	0.13	−1.05	0.30	0.62	1.16
Overqualified #Other	1.03	0.12	0.23	0.82	0.82	1.29
Unemployed # Finland	0.91	0.04	−2.20	0.03	0.84	0.99
Unemployed # Other Nordic	0.98	0.07	−0.21	0.83	0.85	1.14
Unemployed # Other Western	1.01	0.08	0.17	0.87	0.86	1.19
Unemployed # Eastern Europe	0.83	0.07	−2.07	0.04	0.70	0.99
Unemployed # Yugoslavia/Bosnia	0.98	0.08	−0.31	0.76	0.83	1.14
Unemployed # Southern Europe	0.76	0.07	−2.86	0.00	0.62	0.92
Unemployed # MENA	0.80	0.09	−1.93	0.05	0.64	1.00
Unemployed # Turkey	0.73	0.08	−2.94	0.00	0.59	0.90
Unemployed # Other	1.01	0.09	0.13	0.90	0.84	1.21
Mixed (Ref. No)						
Yes	0.81	0.03	−6.33	0.00	0.76	0.87
Age	0.90	0.03	−2.81	0.01	0.84	0.97
Age squared	1.00	0.00	4.99	0.00	1.00	1.00
standardized GPA	0.67	0.01	−49.16	0.00	0.66	0.68
Civil status (Ref. Single)						
Coupled	0.89	0.02	−5.57	0.00	0.85	0.92
Separated	1.21	0.06	4.03	0.00	1.10	1.33
Health problems (t−1, Ref. No)						
Yes	1.63	0.03	29.08	0.00	1.57	1.68
Number of children up to 8						
1	0.95	0.04	−1.20	0.23	0.87	1.03
2	1.01	0.05	0.21	0.84	0.92	1.11
3 or more	1.10	0.07	1.50	0.13	0.97	1.25
Parental occupation (Ref. High skilled & professionals)						
Farmers	0.64	0.04	−6.62	0.00	0.56	0.73
Unskilled	1.18	0.03	7.43	0.00	1.13	1.23
Low skilled	1.07	0.02	2.91	0.00	1.02	1.11
Medium-skilled	0.99	0.02	−0.33	0.74	0.96	1.03
Self-employed	0.95	0.02	−2.04	0.04	0.90	1.00
Missing	1.23	0.05	4.98	0.00	1.13	1.33
Not unemployed	1.37	0.06	7.05	0.00	1.26	1.50
Region (Ref. Stockholm)						
East Middle	1.62	0.03	24.11	0.00	1.56	1.69
South	1.85	0.04	29.80	0.00	1.78	1.93
North Middle	2.15	0.05	32.72	0.00	2.06	2.25
Middle Norrland	2.42	0.07	30.11	0.00	2.28	2.56
Upper Norrland	2.34	0.06	32.49	0.00	2.22	2.46
Smaland & islands	1.40	0.04	13.22	0.00	1.33	1.48
West	1.52	0.03	21.82	0.00	1.47	1.58
Year (Ref. 2003)						
2004	1.12	0.04	3.28	0.00	1.05	1.20
2005	0.71	0.02	−9.95	0.00	0.66	0.76
2006	0.49	0.02	−19.57	0.00	0.46	0.53
2007	0.26	0.01	−34.32	0.00	0.24	0.28
2008	0.21	0.01	−34.71	0.00	0.20	0.23
2009	0.70	0.03	−7.64	0.00	0.63	0.76
2010	0.35	0.02	−20.01	0.00	0.32	0.39
2011	0.19	0.01	−28.55	0.00	0.17	0.22
2012	0.21	0.01	−25.37	0.00	0.18	0.23
2013	0.20	0.01	−24.48	0.00	0.17	0.22
2014	0.06	0.00	−38.68	0.00	0.06	0.07
2015	0.09	0.01	−31.40	0.00	0.08	0.11
2016	0.08	0.01	−30.36	0.00	0.07	0.10
Field of education (Ref. General)						
Teaching methods and teacher edu.	0.95	0.04	−1.25	0.21	0.87	1.03
Humanities and arts	1.60	0.04	17.14	0.00	1.52	1.69
Social sciences, law, commerce, admin.	1.13	0.03	4.71	0.00	1.07	1.18
Natural Sciences, maths & computing	1.30	0.05	7.41	0.00	1.21	1.39
Engineering and manufacturing	0.80	0.02	−10.66	0.00	0.77	0.83
Agriculture and forestry	0.74	0.03	−7.09	0.00	0.68	0.81

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Table A1 (*continued*)

	RRR	Std. err.	z	P > |z|	95% CI Low	95% CI Upp
Health care, nursing, social care	0.74	0.02	−9.49	0.00	0.70	0.79
Services	0.77	0.02	−9.76	0.00	0.73	0.81
Unknown	1.08	0.04	1.91	0.06	1.00	1.16
Education level (Ref. Upper secondary)						
Tertiary	1.12	0.03	4.84	0.00	1.07	1.17
Years from highest degree	1.60	0.04	17.14	0.00	1.52	1.69
Within-unit averages						
Marital status (Ref. Single)						
Coupled	0.55	0.02	−17.95	0.00	0.52	0.59
Separated	1.37	0.11	3.88	0.00	1.17	1.61
Health problems (Ref. No)						
Yes	4.44	0.23	28.79	0.00	4.01	4.91
Number of children up to 8 (Ref. None)						
1	0.63	0.06	−4.99	0.00	0.52	0.75
2	0.53	0.05	−6.41	0.00	0.44	0.65
3 or more	0.50	0.06	−5.56	0.00	0.39	0.64
age	0.81	0.01	−25.26	0.00	0.80	0.82
Initial condition (t = 0)						
Marital status (Ref. Single)						
Coupled	1.29	0.05	7.13	0.00	1.20	1.39
Separated	0.97	0.10	−0.27	0.79	0.79	1.20
Health problems (Ref. No)						
Yes	1.08	0.03	3.27	0.00	1.03	1.14
Number of children up to 8 (ref. None)						
1	1.08	0.09	0.99	0.32	0.92	1.28
2	0.86	0.07	−1.81	0.07	0.72	1.01
3 or more	0.93	0.10	−0.70	0.48	0.75	1.14
age	1.25	0.01	37.76	0.00	1.23	1.26
State (Ref. Matched employment)						
Overqualified	1.26	0.03	9.73	0.00	1.20	1.32
Unemployed	3.59	0.06	75.58	0.00	3.47	3.71
Var(u2)	0.45	0.01			0.43	0.47
Var(u3)	1.61	0.02			1.57	1.66
N. groups						196,875
N. observations						1943,015

Table A2
Effect of past labor market participation state (t−1) on current labor market participation state (t) by origin groups, for women. Correlated random-effects dynamic multinomial logit model with interaction between origin and past labor market participation status, RRR

	RRR	Std. err.	z	P > |z|	95% CI Low	95% CI Upp
Outcome=Overqualified (t)						
Overqualified (t−1)	82.50	0.79	459.66	0.00	80.96	84.07
Unemployed (t−1)	9.04	0.13	153.44	0.00	8.79	9.30
Ancestry (Ref. Sweden)						
Finland	1.11	0.03	3.36	0.00	1.04	1.17
Other Nordic	1.03	0.05	0.59	0.55	0.94	1.13
Other Western	1.04	0.05	0.93	0.35	0.95	1.15
Eastern Europe	1.01	0.05	0.15	0.88	0.91	1.12
Yugoslavia/Bosnia	1.01	0.05	0.11	0.91	0.90	1.12
Southern Europe	1.01	0.06	0.10	0.92	0.89	1.14
MENA	1.12	0.08	1.65	0.10	0.98	1.28
Turkey	0.98	0.07	−0.27	0.78	0.86	1.12
Other	1.08	0.06	1.40	0.16	0.97	1.20
Previous state # Ancestry						
Overqualified # Finland	0.98	0.03	−0.52	0.60	0.92	1.05
Overqualified #Other Nordic	0.98	0.06	−0.30	0.77	0.87	1.11
Overqualified #Other Western	0.91	0.05	−1.73	0.08	0.81	1.01
Overqualified #Eastern Europe	0.97	0.06	−0.53	0.60	0.85	1.10
Overqualified #Yugoslavia/Bosnia	1.16	0.09	1.99	0.05	1.00	1.35
Overqualified #Southern Europe	1.09	0.09	1.03	0.30	0.93	1.29
Overqualification # MENA	0.72	0.07	−3.49	0.00	0.60	0.87
Overqualified #Turkey	0.99	0.10	−0.07	0.94	0.82	1.20
Overqualified #Other	0.78	0.06	−3.55	0.00	0.67	0.89
Unemployed # Finland	0.77	0.04	−4.61	0.00	0.69	0.86
Unemployed # Other Nordic	0.78	0.07	−2.59	0.01	0.65	0.94
Unemployed # Other Western	0.87	0.08	−1.40	0.16	0.72	1.06
Unemployed # Eastern Europe	0.99	0.10	−0.12	0.90	0.81	1.21
Unemployed # Yugoslavia/Bosnia	0.99	0.10	−0.14	0.89	0.80	1.21
Unemployed # Southern Europe	0.90	0.12	−0.81	0.42	0.70	1.16
Unemployed # MENA	0.85	0.12	−1.17	0.24	0.65	1.12

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Table A2 (*continued*)

	RRR	Std. err.	z	P > |z|	95% CI Low	95% CI Upp
Unemployed # Turkey	0.70	0.09	−2.67	0.01	0.54	0.91
Unemployed # Other	0.77	0.09	−2.33	0.02	0.61	0.96
Mixed (Ref. No)						
Yes	0.96	0.02	−1.61	0.11	0.91	1.01
Age	2.15	0.06	28.00	0.00	2.04	2.27
Age squared	0.99	0.00	−24.41	0.00	0.99	0.99
standardized GPA	0.96	0.01	−7.15	0.00	0.95	0.97
Civil status (Ref. Single)						
Coupled	0.96	0.01	−3.13	0.00	0.93	0.98
Separated	0.98	0.03	−0.54	0.59	0.92	1.05
Health problems (t−1, Ref. No)						
Yes	0.93	0.01	−7.52	0.00	0.91	0.94
Number of children up to 8						
1	1.44	0.04	13.27	0.00	1.36	1.52
2	1.68	0.05	17.43	0.00	1.58	1.78
3 or more	1.66	0.06	13.34	0.00	1.54	1.78
Parental occupation (Ref. High skilled & professionals)						
Farmers	1.10	0.04	2.70	0.01	1.03	1.18
Unskilled	1.12	0.02	7.26	0.00	1.08	1.15
Low skilled	1.08	0.02	5.67	0.00	1.05	1.11
Medium-skilled	1.03	0.01	2.67	0.01	1.01	1.05
Self-employed	1.05	0.02	3.18	0.00	1.02	1.09
Missing	1.03	0.03	0.97	0.33	0.97	1.09
Not unemployed	1.09	0.04	2.39	0.02	1.01	1.16
Region (Ref. Stockholm)						
East Middle	1.00	0.01	−0.07	0.94	0.97	1.02
South	0.98	0.01	−1.17	0.24	0.96	1.01
North Middle	0.91	0.02	−5.78	0.00	0.88	0.94
Middle Norrland	0.92	0.02	−3.62	0.00	0.88	0.96
Upper Norrland	1.05	0.02	2.54	0.01	1.01	1.09
Smaland & islands	1.05	0.02	3.30	0.00	1.02	1.09
West	1.00	0.01	0.16	0.87	0.98	1.03
Year (Ref. 2003)						
2004	2.29	0.11	17.22	0.00	2.09	2.52
2005	1.37	0.06	6.59	0.00	1.25	1.50
2006	1.28	0.06	5.13	0.00	1.16	1.40
2007	1.49	0.07	8.29	0.00	1.36	1.64
2008	1.32	0.07	5.44	0.00	1.19	1.45
2009	1.21	0.06	3.59	0.00	1.09	1.34
2010	1.08	0.06	1.42	0.16	0.97	1.21
2011	1.04	0.06	0.71	0.48	0.93	1.17
2012	0.86	0.05	−2.56	0.01	0.76	0.96
2013	0.80	0.05	−3.49	0.00	0.71	0.91
2014	0.08	0.01	−37.77	0.00	0.07	0.09
2015	0.36	0.03	−14.45	0.00	0.32	0.42
2016	0.74	0.05	−4.12	0.00	0.64	0.85
Field of education (Ref. General)						
Teaching methods and teacher edu.	1.44	0.03	14.91	0.00	1.37	1.51
Humanities and arts	1.96	0.05	28.54	0.00	1.87	2.05
Social sciences, law, commerce, admin.	1.98	0.04	30.45	0.00	1.89	2.07
Natural Sciences, maths & computing	2.39	0.07	30.12	0.00	2.25	2.52
Engineering and manufacturing	2.09	0.05	29.77	0.00	1.99	2.19
Agriculture and forestry	1.98	0.06	21.32	0.00	1.86	2.10
Health care, nursing, social care	1.16	0.03	6.59	0.00	1.11	1.21
Services	1.98	0.05	27.21	0.00	1.89	2.08
Unknown	1.60	0.07	10.01	0.00	1.46	1.75
Education level (Ref. Upper secondary)						
Tertiary	4.78	0.07	102.33	0.00	4.64	4.92
Years from highest degree	1.04	0.00	21.00	0.00	1.04	1.05
Within-unit averages						
Marital status (Ref. Single)						
Coupled	1.02	0.02	0.74	0.46	0.98	1.06
Separated	0.97	0.05	−0.51	0.61	0.88	1.08
Health problems (Ref. No)	0.91	0.02	−3.32	0.00	0.87	0.96
Yes						
Number of children up to 8 (Ref. None)						
1	0.64	0.04	−7.38	0.00	0.57	0.72
2	0.49	0.03	−12.41	0.00	0.43	0.54
3 or more	0.44	0.03	−10.86	0.00	0.38	0.51
age	0.91	0.01	−13.42	0.00	0.89	0.92
Initial condition (t = 0)						
Marital status (Ref. Single)						
Coupled	1.05	0.02	2.87	0.00	1.02	1.08
Separated	0.89	0.05	−2.10	0.04	0.79	0.99
Health problems (Ref. No)						
Yes	1.04	0.01	2.95	0.00	1.01	1.07

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Table A2 (*continued*)

	RRR	Std. err.	z	P > |z|	95% CI Low	95% CI Upp
Number of children up to 8 (ref. None)						
1	1.00	0.05	−0.09	0.93	0.90	1.10
2	1.05	0.05	0.99	0.32	0.95	1.15
3 or more	1.12	0.07	1.89	0.06	1.00	1.25
age	0.99	0.00	−2.57	0.01	0.98	1.00
State (Ref. Matched employment)						
Overqualified	2.10	0.03	60.93	0.00	2.05	2.15
Unemployed	1.38	0.02	23.80	0.00	1.35	1.42
Outcome=Unemployed (t)						
Overqualified (t−1)	8.21	0.14	124.52	0.00	7.95	8.49
Unemployed (t−1)	11.25	0.17	163.33	0.00	10.93	11.58
Ancestry (Ref. Sweden)						
Finland	1.42	0.05	9.27	0.00	1.32	1.53
Other Nordic	1.45	0.09	6.25	0.00	1.29	1.63
Other Western	1.32	0.09	4.26	0.00	1.16	1.50
Eastern Europe	1.67	0.11	7.62	0.00	1.46	1.90
Yugoslavia/Bosnia	1.43	0.09	5.69	0.00	1.27	1.62
Southern Europe	1.73	0.13	7.11	0.00	1.49	2.02
MENA	2.03	0.17	8.56	0.00	1.73	2.39
Turkey	2.42	0.16	13.06	0.00	2.12	2.76
Other	1.89	0.13	9.09	0.00	1.65	2.17
Previous state # Ancestry						
Overqualified # Finland	0.88	0.05	−1.99	0.05	0.78	1.00
Overqualified #Other Nordic	0.90	0.10	−0.97	0.33	0.73	1.11
Overqualified #Other Western	1.03	0.10	0.31	0.76	0.85	1.26
Overqualified #Eastern Europe	0.89	0.10	−0.99	0.32	0.72	1.12
Overqualified #Yugoslavia/Bosnia	1.28	0.15	2.10	0.04	1.02	1.61
Overqualified #Southern Europe	0.84	0.12	−1.23	0.22	0.64	1.11
Overqualification # MENA	0.77	0.12	−1.76	0.08	0.57	1.03
Overqualified #Turkey	0.83	0.12	−1.28	0.20	0.62	1.11
Overqualified #Other	0.89	0.11	−0.96	0.34	0.70	1.13
Unemployed # Finland	0.91	0.04	−2.02	0.04	0.83	1.00
Unemployed # Other Nordic	0.95	0.07	−0.70	0.48	0.81	1.10
Unemployed # Other Western	0.98	0.09	−0.22	0.83	0.82	1.17
Unemployed # Eastern Europe	1.08	0.10	0.85	0.39	0.90	1.30
Unemployed # Yugoslavia/Bosnia	1.12	0.10	1.31	0.19	0.94	1.33
Unemployed # Southern Europe	0.79	0.09	−2.10	0.04	0.63	0.98
Unemployed # MENA	0.92	0.11	−0.74	0.46	0.73	1.15
Unemployed # Turkey	0.97	0.09	−0.29	0.77	0.81	1.16
Unemployed # Other	0.84	0.08	−1.78	0.08	0.69	1.02
Mixed (Ref. No)						
Yes	0.81	0.03	−6.28	0.00	0.76	0.87
Age	0.96	0.04	−1.16	0.25	0.89	1.03
Age squared	1.00	0.00	3.77	0.00	1.00	1.00
standardized GPA	0.72	0.01	−40.36	0.00	0.71	0.73
Civil status (Ref. Single)						
Coupled	0.98	0.02	−1.04	0.30	0.94	1.02
Separated	1.13	0.05	2.98	0.00	1.04	1.23
Health problems (t−1, Ref. No)						
Yes	1.43	0.02	27.99	0.00	1.40	1.47
Number of children up to 8						
1	1.16	0.04	4.09	0.00	1.08	1.24
2	1.48	0.06	9.98	0.00	1.37	1.60
3 or more	1.81	0.09	11.88	0.00	1.64	2.00
Parental occupation (Ref. High skilled & professionals)						
Farmers	0.79	0.05	−3.81	0.00	0.70	0.89
Unskilled	1.13	0.03	5.28	0.00	1.08	1.18
Low skilled	1.07	0.02	2.91	0.00	1.02	1.11
Medium-skilled	1.00	0.02	−0.05	0.96	0.96	1.04
Self-employed	1.01	0.03	0.48	0.64	0.96	1.06
Missing	1.22	0.05	4.91	0.00	1.13	1.32
Not unemployed	1.39	0.06	7.65	0.00	1.28	1.52
Region (Ref. Stockholm)						
East Middle	1.46	0.03	19.09	0.00	1.40	1.52
South	1.66	0.03	25.11	0.00	1.60	1.73
North Middle	1.72	0.04	22.61	0.00	1.64	1.80
Middle Norrland	1.88	0.06	20.53	0.00	1.77	2.00
Upper Norrland	1.94	0.05	23.90	0.00	1.83	2.04
Smaland & islands	1.34	0.03	11.60	0.00	1.28	1.41
West	1.38	0.03	17.21	0.00	1.33	1.43
Year (Ref. 2003)						
2004	1.23	0.05	5.29	0.00	1.14	1.33
2005	1.00	0.04	0.07	0.94	0.93	1.08
2006	0.63	0.03	−11.32	0.00	0.58	0.68
2007	0.36	0.02	−23.16	0.00	0.33	0.40
2008	0.30	0.01	−25.20	0.00	0.27	0.33

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Table A2 (*continued*)

	RRR	Std. err.	z	P > |z|	95% CI Low	95% CI Upp
2009	0.56	0.03	−11.30	0.00	0.51	0.62
2010	0.39	0.02	−16.71	0.00	0.35	0.44
2011	0.26	0.02	−22.15	0.00	0.23	0.30
2012	0.24	0.02	−22.41	0.00	0.21	0.27
2013	0.21	0.01	−23.05	0.00	0.18	0.24
2014	0.08	0.01	−34.83	0.00	0.07	0.09
2015	0.10	0.01	−29.07	0.00	0.09	0.12
2016	0.09	0.01	−28.53	0.00	0.08	0.11
Field of education (Ref. General)						
Teaching methods and teacher edu.	0.64	0.02	−13.77	0.00	0.60	0.68
Humanities and arts	1.69	0.04	21.64	0.00	1.61	1.78
Social sciences, law, commerce, admin.	1.19	0.03	7.07	0.00	1.13	1.24
Natural Sciences, maths & computing	1.68	0.07	13.05	0.00	1.55	1.82
Engineering and manufacturing	1.14	0.04	4.30	0.00	1.08	1.21
Agriculture and forestry	1.24	0.05	5.77	0.00	1.15	1.33
Health care, nursing, social care	0.66	0.01	−18.55	0.00	0.63	0.69
Services	1.08	0.03	2.61	0.01	1.02	1.14
Unknown	1.24	0.06	4.48	0.00	1.13	1.36
Education level (Ref. Upper secondary)						
Tertiary	0.93	0.02	−3.46	0.00	0.89	0.97
Years from highest degree	1.04	0.00	13.65	0.00	1.04	1.05
Within-unit averages						
Marital status (Ref. Single)						
Coupled	0.69	0.02	−12.07	0.00	0.65	0.74
Separated	1.20	0.08	2.76	0.01	1.05	1.37
Health problems (Ref. No)						
Yes	1.54	0.06	11.98	0.00	1.44	1.66
Number of children up to 8 (Ref. None)						
1	0.82	0.06	−2.84	0.01	0.71	0.94
2	0.53	0.04	−8.99	0.00	0.47	0.61
3 or more	0.43	0.04	−9.34	0.00	0.36	0.51
age	0.79	0.01	−27.85	0.00	0.78	0.81
Initial condition (t = 0)						
Marital status (Ref. Single)						
Coupled	1.12	0.03	4.25	0.00	1.06	1.18
Separated	1.06	0.07	0.81	0.42	0.92	1.21
Health problems (Ref. No)						
Yes	1.10	0.02	5.28	0.00	1.06	1.14
Number of children up to 8 (ref. None)						
1	0.83	0.05	−3.09	0.00	0.73	0.93
2	0.70	0.04	−5.93	0.00	0.62	0.78
3 or more	0.83	0.06	−2.52	0.01	0.72	0.96
age	1.22	0.01	36.81	0.00	1.21	1.24
State (Ref. Matched employment)						
Overqualified	1.53	0.03	20.80	0.00	1.47	1.59
Unemployed	3.14	0.06	63.60	0.00	3.04	3.26
Var(u2)	0.79	0.02			0.76	0.82
Var(u3)	1.50	0.03			1.45	1.55
N. groups						194,435
N. observations						1768,696

Table A3
Robustness checks. Correlated random-effects dynamic multinomial logit models for different definitions of unemployment, for men, RRR (standard errors in parentheses)

	60 days		120 days	
	Overqualified	Unemployed	Overqualified	Unemployed
Overqualified (t−1)	77.691***	7.562***	78.435***	7.549***
	−0.678	−0.115	−0.677	−0.133
Unemployed (t−1)	6.319***	12.005***	5.870***	10.200***
	−0.077	−0.148	−0.084	−0.156
Ancestry (Ref. Sweden)	1	1	1	1
	(.)	(.)	(.)	(.)

(*continued on next page*)

Table A3 (*continued*)

	60 days		120 days	
Finland	1.038	1.489***	1.035	1.561***
	−0.026	−0.052	−0.026	−0.062
Other Nordic	0.983	1.488***	0.993	1.500***
	−0.04	−0.082	−0.039	−0.094
Other Western	0.97	1.464***	0.984	1.550***
	−0.039	−0.087	−0.039	−0.105
East-Eu	0.984	1.605***	0.996	1.711***
	−0.042	−0.099	−0.042	−0.119
Former Yugoslavia	0.968	1.607***	0.956	1.778***
	−0.043	−0.092	−0.042	−0.113
South-Eu	0.959	1.709***	0.952	1.823***
	−0.051	−0.119	−0.049	−0.143
MENA	0.873*	1.932***	0.874*	2.379***
	−0.054	−0.153	−0.053	−0.205
Turkey	0.955	2.420***	0.945	3.119***
	−0.059	−0.181	−0.058	−0.251
Other	0.963	1.730***	0.971	1.907***
	−0.046	−0.111	−0.045	−0.137
Previous state # Ancestry				
Overqualified # Finland	1.075*	0.987	1.071*	1.027
	−0.033	−0.055	−0.032	−0.063
Overqualified #Other Nordic	1.049	0.942	1.036	1.061
	−0.056	−0.089	−0.054	−0.111
Overqualified #Other Western	0.983	0.998	0.978	0.932
	−0.05	−0.094	−0.049	−0.101
Overqualified #Eastern Europe	0.923	0.97	0.929	0.939
	−0.054	−0.103	−0.053	−0.112
Overqualified #Yugoslavia/Bosnia	1.054	1.113	1.057	1.089
	−0.068	−0.12	−0.067	−0.129
Overqualified #Southern Europe	1.022	1.044	1.019	1.159
	−0.078	−0.136	−0.076	−0.164
Overqualification # MENA	0.956	0.886	0.971	0.807
	−0.085	−0.134	−0.084	−0.134
Overqualified #Turkey	0.957	0.896	0.967	0.843
	−0.089	−0.137	−0.089	−0.139
Overqualified #Other	0.983	1.016	0.988	0.995
	−0.064	−0.113	−0.063	−0.123
Unemployed # Finland	0.844***	0.901**	0.853**	0.911
	−0.04	−0.036	−0.046	−0.043
Unemployed # Other Nordic	0.914	0.873*	0.982	1.009
	−0.073	−0.059	−0.089	−0.082
Unemployed # Other Western	1.223*	0.98	1.185	1.01
	−0.097	−0.074	−0.111	−0.094
Unemployed # Eastern Europe	1.064	0.948	0.898	0.792*
	−0.095	−0.077	−0.092	−0.075
Unemployed # Yugoslavia/Bosnia	0.798*	0.99	0.861	0.985
	−0.075	−0.075	−0.09	−0.086
Unemployed # Southern Europe	0.761*	0.743**	0.806	0.785*
	−0.086	−0.068	−0.102	−0.085
Unemployed # MENA	1.025	0.882	0.941	0.811
	−0.13	−0.094	−0.136	−0.098
Unemployed # Turkey	0.764*	0.835	0.804	0.745**
	−0.099	−0.083	−0.114	−0.084
Unemployed # Other	0.935	1.016	0.881	1.002
	−0.09	−0.087	−0.099	−0.101
Mixed (Ref. No)				
Yes	0.981	0.817***	0.98	0.799***
	−0.021	−0.025	−0.021	−0.028
Age	4.076***	0.895***	4.131***	0.909*
	−0.1	−0.03	−0.102	−0.036
Age squared	0.980***	1.003***	0.980***	1.003***
	0	−0.001	0	−0.001
standardized GPA	0.937***	0.694***	0.935***	0.653***
	−0.004	−0.005	−0.004	−0.006
Civil status (Ref. Single)				
Coupled	1.004	0.886***	1.015	0.883***
	−0.012	−0.017	−0.012	−0.021
Separated	0.935*	1.228***	0.928*	1.270***

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Table A3 (*continued*)

	60 days		120 days	
	−0.031	−0.053	−0.031	−0.065
Health problems (t−1, Ref. No)				
Lsick= 1	0.936***	1.624***	0.935***	1.677***
	−0.014	−0.025	−0.013	−0.03
Number of children up to 8				
1	1.447***	0.943	1.444***	0.916
	−0.045	−0.038	−0.044	−0.043
2	1.892***	1	1.883***	0.993
	−0.063	−0.046	−0.063	−0.054
3 or more	2.360***	1.054	2.362***	1.089
	−0.097	−0.061	−0.097	−0.075
Parental occupation (Ref. High skilled & professionals)				
Farmers	1.017	0.676***	1.013	0.583***
	−0.032	−0.041	−0.032	−0.044
Unskilled	1.170***	1.168***	1.174***	1.170***
	−0.015	−0.024	−0.015	−0.028
Low skilled	1.164***	1.072***	1.165***	1.054*
	−0.014	−0.022	−0.014	−0.025
Medium-skilled	1.037***	1.009	1.037***	0.982
	−0.009	−0.017	−0.009	−0.02
Self-employed	1.087***	0.96	1.089***	0.943*
	−0.015	−0.023	−0.015	−0.027
Missing	1.038	1.219***	1.04	1.254***
	−0.026	−0.047	−0.026	−0.056
Not unemployed	1.011	1.341***	1.013	1.421***
	−0.03	−0.056	−0.03	−0.068
Region (Ref. Stockholm)				
East Middle	1.125***	1.553***	1.127***	1.682***
	−0.012	−0.029	−0.012	−0.037
South	1.133***	1.756***	1.138***	1.931***
	−0.013	−0.033	−0.013	−0.044
North Middle	1.181***	2.079***	1.193***	2.203***
	−0.016	−0.045	−0.016	−0.056
Middle Norrland	1.141***	2.299***	1.151***	2.489***
	−0.021	−0.062	−0.021	−0.079
Upper Norrland	1.186***	2.201***	1.196***	2.427***
	−0.018	−0.053	−0.019	−0.069
Smaland & islands	1.322***	1.376***	1.322***	1.414***
	−0.018	−0.032	−0.018	−0.04
West	1.145***	1.471***	1.145***	1.554***
	−0.012	−0.026	−0.012	−0.033
Year (Ref. 2003)				
2004	2.514***	1.136***	2.511***	1.047
	−0.123	−0.036	−0.124	−0.039
2005	1.548***	0.734***	1.530***	0.674***
	−0.074	−0.024	−0.074	−0.025
2006	1.486***	0.521***	1.456***	0.440***
	−0.071	−0.018	−0.07	−0.017
2007	2.624***	0.285***	2.630***	0.230***
	−0.127	−0.011	−0.128	−0.01
2008	2.210***	0.246***	2.177***	0.184***
	−0.111	−0.01	−0.11	−0.009
2009	1.980***	0.760***	1.949***	0.618***
	−0.104	−0.034	−0.103	−0.031
2010	1.874***	0.392***	1.844***	0.293***
	−0.102	−0.019	−0.101	−0.016
2011	1.949***	0.222***	1.903***	0.166***
	−0.111	−0.012	−0.109	−0.01
2012	1.331***	0.240***	1.278***	0.173***
	−0.079	−0.014	−0.076	−0.012
2013	1.270***	0.226***	1.223**	0.161***
	−0.078	−0.014	−0.076	−0.011
2014	0.107***	0.077***	0.100***	0.051***
	−0.007	−0.005	−0.006	−0.004
2015	0.579***	0.111***	0.559***	0.074***
	−0.039	−0.008	−0.038	−0.006
2016	1.154*	0.103***	1.129	0.065***
	−0.08	−0.008	−0.079	−0.006

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Table A3 (*continued*)

	60 days		120 days	
Field of education (Ref. General)				
Teaching methods and teacher edu.	1.864***	1.093*	1.871***	0.881**
	−0.041	−0.043	−0.041	−0.043
Humanities and arts	1.552***	1.591***	1.557***	1.590***
	−0.029	−0.04	−0.029	−0.047
Social sciences, law, commerce, admin.	1.551***	1.127***	1.547***	1.107***
	−0.025	−0.027	−0.025	−0.03
Natural Sciences, maths & computing	1.630***	1.275***	1.620***	1.273***
	−0.033	−0.041	−0.033	−0.048
Engineering and manufacturing	1.608***	0.809***	1.605***	0.786***
	−0.023	−0.016	−0.023	−0.018
Agriculture and forestry	1.539***	0.788***	1.544***	0.698***
	−0.039	−0.03	−0.039	−0.032
Health care, nursing, social care	0.909***	0.756***	0.912***	0.715***
	−0.018	−0.022	−0.018	−0.024
Services	1.216***	0.792***	1.211***	0.728***
	−0.021	−0.02	−0.021	−0.022
Unknown	1.258***	1.05	1.255***	1.057
	−0.035	−0.038	−0.035	−0.044
Education level (Ref. Upper secondary)				
Tertiary	4.255***	1.091***	4.175***	1.127***
	−0.054	−0.023	−0.053	−0.028
Years from highest degree	1.023***	1.033***	1.024***	1.023***
	−0.002	−0.003	−0.002	−0.004
Within-unit averages				
Marital status (Ref. Single)				
Coupled	0.922***	0.600***	0.904***	0.514***
	−0.017	−0.018	−0.017	−0.019
Separated	1.001	1.350***	1.009	1.348***
	−0.056	−0.101	−0.056	−0.119
Health problems (Ref. No)				
Yes	1.717***	4.245***	1.746***	4.524***
	−0.064	−0.206	−0.065	−0.25
Number of children up to 8 (Ref. None)				
1	0.567***	0.682***	0.572***	0.608***
	−0.036	−0.06	−0.037	−0.061
2	0.354***	0.606***	0.359***	0.501***
	−0.022	−0.055	−0.023	−0.053
3 or more	0.269***	0.574***	0.272***	0.431***
	−0.021	−0.067	−0.022	−0.059
	0.954***	0.825***	0.952***	0.787***
	−0.007	−0.007	−0.007	−0.007
Initial condition (t = 0)				
Marital status (Ref. Single)				
Coupled	1.068***	1.230***	1.069***	1.300***
	−0.018	−0.04	−0.018	−0.052
Separated	0.999	0.983	1.022	0.992
	−0.072	−0.097	−0.074	−0.113
Health problems (Ref. No)				
Yes	1.006	1.069**	1.008	1.098***
	−0.016	−0.024	−0.016	−0.029
Number of children up to 8 (ref. None)				
1	1.174**	1.038	1.161**	1.123
	−0.063	−0.08	−0.063	−0.099
2	1.404***	0.812**	1.384***	0.864
	−0.073	−0.065	−0.072	−0.081
3 or more	1.521***	0.89	1.501***	1.019
	−0.096	−0.088	−0.095	−0.117
Age	0.961***	1.229***	0.963***	1.272***
	−0.004	−0.007	−0.004	−0.008
State (Ref. Matched employment)				
Overqualified	1.457***	1.290***	1.446***	1.192***
	−0.016	−0.028	−0.016	−0.03
Unemployed	1.150***	3.278***	1.152***	3.945***
	−0.011	−0.049	−0.014	−0.076
Var(u2)	1.570***		1.567***	
	−0.019		−0.019	
Var(u3)	4.407***		5.763***	
	−0.093		−0.16	
N. Observations	1943015		1943015	

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A4
Robustness checks. Correlated random-effects dynamic multinomial logit models for different definitions of unemployment, for women, RRR (standard errors in parentheses)

	60 days		120 days	
	Overqualified	Unemployed	Overqualified	Unemployed
Overqualified (t−1)	82.793***	8.276***	82.210***	8.250***
	−0.802	−0.128	−0.785	−0.152
Unemployed (t−1)	9.086***	11.030***	8.769***	11.425***
	−0.119	−0.144	−0.138	−0.191
Ancestry (Ref. Sweden)				
Finland	1.096**	1.353***	1.103**	1.452***
	−0.033	−0.048	−0.033	−0.058
Other Nordic	1.015	1.397***	1.023	1.566***
	−0.05	−0.077	−0.049	−0.098
Other Western	1.034	1.208**	1.031	1.346***
	−0.049	−0.074	−0.048	−0.095
East-Eu	0.99	1.553***	1.013	1.832***
	−0.052	−0.098	−0.052	−0.129
Former Yugoslavia	1.014	1.374***	1.004	1.554***
	−0.056	−0.082	−0.054	−0.103
South-Eu	1.012	1.561***	0.997	1.752***
	−0.065	−0.115	−0.063	−0.146
MENA	1.126	1.796***	1.133	2.128***
	−0.079	−0.142	−0.077	−0.187
Turkey	0.976	2.077***	0.979	2.649***
	−0.068	−0.136	−0.066	−0.187
Other	1.056	1.749***	1.075	1.883***
	−0.059	−0.115	−0.059	−0.142
Previous state # Ancestry				
Overqualified # Finland	0.973	0.929	0.981	0.914
	−0.034	−0.053	−0.033	−0.06
Overqualified #Other Nordic	0.991	0.915	0.985	0.903
	−0.061	−0.09	−0.059	−0.1
Overqualified #Other Western	0.898	1.036	0.909	1.003
	−0.051	−0.099	−0.05	−0.111
Overqualified #Eastern Europe	0.986	0.955	0.956	0.868
	−0.066	−0.1	−0.062	−0.104
Overqualified #Yugoslavia/Bosnia	1.155	1.243	1.152	1.246
	−0.088	−0.139	−0.086	−0.152
Overqualified #Southern Europe	1.066	0.857	1.094	0.974
	−0.091	−0.116	−0.091	−0.144
Overqualification # MENA	0.715***	0.772	0.726***	0.743
	−0.067	−0.112	−0.066	−0.121
Overqualified #Turkey	1.045	0.826	1.009	0.838
	−0.102	−0.119	−0.096	−0.128
Overqualified #Other	0.776***	0.878	0.774***	0.952
	−0.056	−0.1	−0.055	−0.121
Unemployed # Finland	0.846**	0.948	0.733***	0.935
	−0.043	−0.04	−0.045	−0.049
Unemployed # Other Nordic	0.800*	0.974	0.784*	0.830*
	−0.07	−0.067	−0.081	−0.07
Unemployed # Other Western	0.887	1.041	0.952	0.994
	−0.078	−0.083	−0.101	−0.1
Unemployed # Eastern Europe	1.025	1.12	1.007	0.985
	−0.099	−0.095	−0.112	−0.1
Unemployed # Yugoslavia/Bosnia	0.97	1.132	1.008	1.041
	−0.097	−0.092	−0.113	−0.099
Unemployed # Southern Europe	0.884	0.868	0.932	0.794
	−0.108	−0.089	−0.131	−0.1
Unemployed # MENA	0.844	0.964	0.755	0.871
	−0.111	−0.104	−0.114	−0.11
Unemployed # Turkey	0.743*	1.092	0.687**	0.964
	−0.094	−0.095	−0.096	−0.094
Unemployed # Other	0.851	0.872	0.773*	0.917
	−0.09	−0.079	−0.096	−0.102
Mixed (Ref. No)				
Yes	0.973	0.846***	0.966	0.786***
	−0.024	−0.026	−0.024	−0.028
Age	2.127***	0.945	2.163***	0.959
	−0.058	−0.033	−0.059	−0.04

(*continued on next page*)

Table A4 (*continued*)

	60 days		120 days	
Age squared	0.990***	1.002***	0.990***	1.002***
	0	−0.001	0	−0.001
standardized GPA	0.962***	0.744***	0.959***	0.709***
	−0.005	−0.006	−0.005	−0.006
Civil status (Ref. Single)				
Coupled	0.960**	0.968	0.959**	1.007
	−0.013	−0.018	−0.013	−0.023
Separated	0.98	1.096*	0.983	1.161**
	−0.032	−0.042	−0.032	−0.053
Health problems (t−1, Ref. No)				
Lsick= 1	0.929***	1.401***	0.925***	1.463***
	−0.01	−0.017	−0.01	−0.021
Number of children up to 8				
1	1.426***	1.132***	1.450***	1.123**
	−0.039	−0.037	−0.04	−0.043
2	1.648***	1.422***	1.697***	1.468***
	−0.049	−0.051	−0.05	−0.063
3 or more	1.613***	1.726***	1.685***	1.820***
	−0.061	−0.079	−0.064	−0.099
Parental occupation (Ref. High skilled & professionals)				
Farmers	1.109**	0.818***	1.099**	0.763***
	−0.04	−0.045	−0.04	−0.053
Unskilled	1.117***	1.089***	1.114***	1.143***
	−0.017	−0.022	−0.017	−0.028
Low skilled	1.082***	1.038	1.081***	1.068**
	−0.015	−0.021	−0.015	−0.025
Medium-skilled	1.029**	0.987	1.027*	1.005
	−0.011	−0.016	−0.011	−0.02
Self-employed	1.051**	1.019	1.055**	1.007
	−0.017	−0.024	−0.017	−0.028
Missing	1.026	1.206***	1.027	1.253***
	−0.03	−0.045	−0.03	−0.055
Not unemployed	1.082*	1.332***	1.088*	1.440***
	−0.037	−0.054	−0.037	−0.067
Region (Ref. Stockholm)				
East Middle	1	1.396***	1.002	1.524***
	−0.013	−0.025	−0.013	−0.033
South	0.983	1.566***	0.989	1.749***
	−0.013	−0.029	−0.013	−0.039
North Middle	0.903***	1.654***	0.912***	1.756***
	−0.015	−0.036	−0.015	−0.046
Middle Norrland	0.916***	1.801***	0.928***	1.910***
	−0.02	−0.051	−0.021	−0.064
Upper Norrland	1.042*	1.880***	1.060**	2.012***
	−0.02	−0.047	−0.02	−0.06
Smaland & islands	1.056***	1.303***	1.057***	1.369***
	−0.017	−0.03	−0.017	−0.038
West	1.002	1.337***	1.005	1.426***
	−0.012	−0.023	−0.012	−0.029
Year (Ref. 2003)				
2004	2.258***	1.267***	2.345***	1.205***
	−0.108	−0.046	−0.114	−0.052
2005	1.387***	1.003	1.389***	1.009
	−0.065	−0.036	−0.066	−0.043
2006	1.287***	0.689***	1.276***	0.604***
	−0.061	−0.026	−0.061	−0.027
2007	1.503***	0.408***	1.516***	0.343***
	−0.072	−0.016	−0.074	−0.016
2008	1.341***	0.344***	1.314***	0.276***
	−0.067	−0.015	−0.067	−0.014
2009	1.224***	0.606***	1.221***	0.535***
	−0.065	−0.029	−0.065	−0.03
2010	1.107	0.446***	1.084	0.369***
	−0.061	−0.023	−0.061	−0.022
2011	1.063	0.304***	1.046	0.243***
	−0.062	−0.017	−0.062	−0.016
2012	0.879*	0.279***	0.853**	0.218***
	−0.054	−0.017	−0.053	−0.015
2013	0.824**	0.245***	0.800***	0.186***
	−0.052	−0.016	−0.051	−0.014
2014	0.084***	0.095***	0.078***	0.069***
	−0.006	−0.006	−0.005	−0.005
2015	0.375***	0.133***	0.364***	0.092***

(*continued on next page*)

Table A4 (*continued*)

	60 days		120 days	
	−0.026	−0.01	−0.026	−0.008
2016	0.755***	0.122***	0.749***	0.083***
	−0.055	−0.009	−0.055	−0.007
Field of education (Ref. General)				
Teaching methods and teacher edu.	1.427***	0.722***	1.445***	0.611***
	−0.035	−0.021	−0.035	−0.022
Humanities and arts	1.963***	1.699***	1.972***	1.698***
	−0.046	−0.038	−0.046	−0.044
Social sciences, law, commerce, admin.	1.987***	1.188***	1.978***	1.183***
	−0.045	−0.027	−0.044	−0.031
Natural Sciences, maths & computing	2.384***	1.650***	2.397***	1.741***
	−0.069	−0.06	−0.069	−0.075
Engineering and manufacturing	2.091***	1.120***	2.097***	1.187***
	−0.052	−0.032	−0.052	−0.039
Agriculture and forestry	1.969***	1.235***	1.994***	1.242***
	−0.063	−0.042	−0.064	−0.049
Health care, nursing, social care	1.155***	0.665***	1.156***	0.656***
	−0.025	−0.014	−0.025	−0.016
Services	1.978***	1.115***	1.996***	1.049
	−0.05	−0.029	−0.05	−0.032
Unknown	1.599***	1.217***	1.603***	1.229***
	−0.075	−0.054	−0.075	−0.063
Education level (Ref. Upper secondary)				
Tertiary	4.919***	0.966	4.687***	0.899***
	−0.075	−0.019	−0.072	−0.021
Years from highest degree	1.041***	1.047***	1.043***	1.045***
	−0.002	−0.003	−0.002	−0.004
Within-unit averages				
Marital status (Ref. Single)				
Coupled	1.016	0.719***	1.013	0.654***
	−0.021	−0.02	−0.021	−0.022
Separated	0.98	1.248***	0.984	1.207**
	−0.053	−0.076	−0.053	−0.087
Health problems (Ref. No)				
Yes	0.905***	1.519***	0.922**	1.567***
	−0.025	−0.051	−0.025	−0.061
Number of children up to 8 (Ref. None)				
1	0.651***	0.865*	0.635***	0.836*
	−0.039	−0.057	−0.038	−0.064
2	0.496***	0.573***	0.479***	0.525***
	−0.029	−0.037	−0.028	−0.04
3 or more	0.460***	0.447***	0.432***	0.435***
	−0.035	−0.037	−0.032	−0.042
	0.907***	0.819***	0.907***	0.778***
	−0.007	−0.006	−0.007	−0.007
Initial condition (t = 0)				
Marital status (Ref. Single)				
Coupled	1.047**	1.104***	1.049**	1.134***
	−0.017	−0.026	−0.017	−0.032
Separated	0.884*	1.043	0.890*	1.037
	−0.05	−0.066	−0.051	−0.075
Health problems (Ref. No)				
Yes	1.041**	1.101***	1.038**	1.117***
	−0.014	−0.018	−0.014	−0.022
Number of children up to 8 (ref. None)				
1	0.994	0.816***	0.997	0.819**
	−0.051	−0.047	−0.051	−0.054
2	1.047	0.708***	1.046	0.696***
	−0.05	−0.04	−0.05	−0.046
3 or more	1.106	0.836**	1.121	0.818*
	−0.065	−0.058	−0.066	−0.065
Age	0.988**	1.205***	0.988**	1.237***
	−0.004	−0.006	−0.004	−0.007
State (Ref. Matched employment)				
Overqualified	2.104***	1.515***	2.096***	1.533***
	−0.026	−0.029	−0.025	−0.034
Unemployed	1.398***	2.933***	1.379***	3.403***
	−0.017	−0.046	−0.021	−0.071
Var(u2)	2.217***		2.226***	
	−0.034		−0.034	
Var(u3)	4.053***		4.852***	
	−0.088		−0.139	
N. Observations	1768696		1768696	

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A5
Definition of origin groups according to parental country of origin

	Finland	Other Nordic	Western	E. European	Y/B	S. European	MENA	Turkey	Non-Western
Finland	X								
Denmark		X							
Iceland		X							
Norway		X							
UK and Ireland			X						
Germanic states			X						
Netherlands			X						
France and Benelux			X						
USA and Canada			X						
NZ and Australia			X						
Poland				X					
Latvia and Lithuania				X					
East Europe				X					
Bulgaria				X					
Romania				X					
Czech R and Slovakia				X					
Hungary				X					
Estonia				X					
Bosnia Herzegovina					X				
Yugoslavia					X				
South Europe						X			
Greece and Cyprus						X			
Italy and Malta						X			
Somalia and Djibouti							X		
Eritrea							X		
Ethiopia							X		
North Africa (except Egypt)							X		
Egypt							X		
Other Middle East							X		
Lebanon							X		
Syria							X		
Iraq							X		
Afghanistan							X		
Iran							X		
Turkey								X	
Central America and Caribbean									X
Chile									X
South America									X
Other Africa									X
China (excluding Taiwan and HK)									X
Other East Asia									X
Other South-East Asia and Pacific									X
Philippines									X
Vietnam									X
Thailand									X
Pakistan and Bangladesh									X
India Nepal Bhutan									X
Sri Lanka									X
North and South Korea									X
Brazil									X
Other									X

Western, Other Western; Yugoslavia, E. Europe, Eastern European; Y/B. Former Yugoslavia and Bosnia; S. Europe Southern European; Non-Western, Other Non-Western

Table A6
Differences between probabilities of A and D pathways, by origin and sex

	Women			**Men**		
Origin	A (%)	D (%)	D-A (%)	A (%)	D (%)	D-A (%)
Sweden	28.5	58.6	30.1	24.1	60.7	36.6
Finland	26.9	58.7	31.8	22.3	60.1	37.8
Other Nordic	27.8	58.9	31.1	23.4	58.2	34.8
Other Western	28.5	57.9	29.4	24.2	55.7	31.5
Eastern Europe	28	54.2	26.2	24.6	58.5	33.9
Former Yugoslavia	25.2	55.2	30	23	59.8	36.8
Southern Europe	26.5	57.5	31	23.4	62.9	39.5
MENA plus	30.3	54.4	24.1	25.2	59.4	34.2
Turkey	27.2	55.5	28.3	23.9	59.2	35.3
Other	29.6	57.4	27.8	23.8	57.8	34

Source: Figs. 2, 3, A1, and A2. Authors' own calculations.

Table A7
Comparison of Predicted Transition Probabilities across Mode- and Mean-Based Overqualification Measures

		Mode-based method (%)			Mean-based method (%)		
Men							
Origin		Matched in t	Overqualified in t	Unemployed in t	Matched in t	Overqualified in t	Unemployed in t
Sweden	Matched in t−1	89.2	7.9	2.9	93.9	3.2	2.9
Nordic	Matched in t−1	88.6	7.8	3.6	93.4	3.0	3.5
Other Europe	Matched in t−1	88.4	7.8	3.8	92.6	3.7	3.7
Non-Europe	Matched in t−1	87.8	7.5	4.7	91.7	3.7	4.6
Sweden	Overqualified in t−1	23.3	72.2	4.5	54.4	37.8	7.8
Nordic	Overqualified in t−1	22.0	72.8	5.2	51.9	39.1	9.0
Other Europe	Overqualified in t−1	23.3	70.7	5.9	53.5	36.9	9.7
Non-Europe	Overqualified in t−1	22.4	70.7	7.0	50.4	38.5	11.1
Sweden	Unemployed in t−1	60.4	25.7	13.9	73.7	12.2	14.1
Nordic	Unemployed in t−1	60.6	23.5	15.9	72.8	11.2	16.0
Other Europe	Unemployed in t−1	59.3	25.0	15.7	70.7	13.2	16.1
Non-Europe	Unemployed in t−1	59.1	21.6	19.3	68.3	12.3	19.4
Women							
Origin		Matched in t	Overqualified in t	Unemployed in t	Matched in t	Overqualified in t	Unemployed in t
Sweden	Matched in t−1	90.5	6.7	2.8	93.7	3.5	2.8
Nordic	Matched in t−1	89.8	6.8	3.4	93.2	3.5	3.3
Other Europe	Matched in t−1	89.7	6.7	3.5	92.9	3.6	3.5
Non-Europe	Matched in t−1	88.8	6.8	4.5	92.0	3.6	4.4
Sweden	Overqualified in t−1	26.4	68.2	5.4	46.6	46.3	7.1
Nordic	Overqualified in t−1	25.5	68.9	5.6	45.1	47.7	7.2
Other Europe	Overqualified in t−1	26.4	67.3	6.4	45.8	46.1	8.0
Non-Europe	Overqualified in t−1	25.8	66.3	7.9	45.5	43.9	10.6
Sweden	Unemployed in t−1	58.6	27.3	14.1	70.1	15.7	14.2
Nordic	Unemployed in t−1	60.2	23.9	15.9	69.9	14.2	15.9
Other Europe	Unemployed in t−1	57.6	25.7	16.7	67.9	15.3	16.8
Non-Europe	Unemployed in t−1	56.2	23.6	20.1	66.1	13.8	20.1

Notes: All models were controlled for age (age squared), marital status, the number of children below 8 years of age, previous health conditions, standardized GPA at age 16, years since completing education, field of study, parental SES, and region of residence. In this robustness check, we used a simpler model specification with aggregated origin, namely Sweden (reference category), Nordic (Finnish + Other Nordic), Other European (Other Western + Southern European + Eastern European), and Non-European (Former Yugoslav/Bosnian + Turkish + MENA + Other Non-Western). We also aggregated some covariates, such as parental SES (farmers/unskilled, low-skilled, medium-skilled, high-skilled and professionals, self-employed, not employed, unknown/missing), region (Stockholm, Other cities/South & West, North and Rural), and field of education (General/unknown, Humanities, Arts, Social Sciences and Law, Natural Sciences, Mathematics, Computing, Engineering & Agriculture, and Health, Care, and Services). We also excluded the educational attainment due to collinearity issues when using the mean-based operationalization of overqualification. Full regression results regarding this robustness check are available upon request.

Data availability

Data may be obtained from a third party and are not publicly available. Aggregated data can be made available by the authors, conditional on ethical vetting. The authors access the individual-level data through Statistics Sweden's micro-online access system MONA. The analyses have been approved by the Swedish ethical-vetting authority, Dnr 2017/1980–31/5.

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