Intragenerational occupational mobility: the effect of crisis and overeducation on career mobility in a segmented labour market

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Abstract

This paper explores occupational and employment mobility over the previous decade in Greece and contributes to a better understanding of the consequences of the sovereign debt crisis. Our findings suggest that downward mobility was the common trend in intra-generational occupational mobility during the first period of the crisis. Significant changes occurred between 2011-2015. The recovery is apparent during the third bailout program with higher upward occupational and employment movements. However, polarization in the middle-paid professions was noticed. Additionally, this paper highlights the role of education in career mobility and the problem of overeducation. The empirical results reveal that tertiary graduates were more likely to move downward during the first period of the crisis even though overeducated workers had more possibilities to experience upward mobility. Overeducation in Greece seems to be the result of the increasing number of tertiary graduates, low proportion of high-skilled job positions and high levels of unemployment.

Keywords: social mobility, occupational mobility, overeducation, economic crisis, public sector

1 INTRODUCTION

Intra-generational occupational mobility reflects the trajectories of the careers of workers, and it is responsive to labour market shocks such as drops in economic activity. The advantage of studying career mobility (intra-generational mobility) is that it is more volatile than the mobility of social classes and is responsive to labour market shocks such as drops in economic activity (OECD, 2018; Constant and Zimmermann, 2003). The main effect of the recent financial crisis on occupational and employment mobility in Greece was that many people became unemployed, changed their occupational status or type of occupation or increasingly became part-time employed. A larger percentage of older workers taking early retirement was observed during that period as well as extension of years in education because of the difficult conditions in the job market.

Changes in the **composition of economic activity** are a major factor in occupational mobility. The post-industrialization era was a period when occupational stratification was transformed into a more open and merit-oriented structure with the importance of educational achievements being crucial for social mobility. Unlike the hypothesis that industrialized and modern economies would present similar patterns of occupational mobility during periods of economic growth (with prevalent upward mobility) or decline, comparative research indicated that the significant differences among them tend to be influenced by country-specific characteristics (labour market institutions, expansion of the public sector, employment legislation, educational system, etc). Such factors can have implications for labour market segmentation and deregulation (Pohlig, 2021; Symeonaki and Stamatopoulou, 2020). The **business cycle of the economy** is linked with mobility rates. Higher upward mobility is found in countries with continuous expansion of the market while in countries with lower mobility this expansion took place earlier and affected the possibilities of the

previous generation. In the former case, more jobs were created for the upper classes in the occupational strata, there was a moderate shift in the middle of the occupational distribution and shrinkage for the lower tail. In the second case, the lower classes expanded and it is common to notice downward mobility as well (OECD, 2018). Occupational changes through geographical mobility are a major objective of **European integration.** EU citizens have more chances to deal with macroeconomic shocks at the national level because there is the option of emigrating to find work in another country. When these shocks affect a greater number of countries, this mechanism may not be able to absorb the effects of the disintegration of the labour market (Anastasiadou, Batiou and Valkanos, 2015). **Additional institutional factors** such as the extent of market competition particularly during a recession can affect occupational mobility.

The individual characteristics of labours can create **patterns of occupational mobility**. Better education increases the likelihood of job upgrading. That is, better educated individuals have a higher probability of accessing jobs with higher incomes and fewer chances for downward mobility into low-paid jobs (Symeonaki, Stamatopoulou and Michalopoulou, 2012). Higher education outcomes and overeducation (higher qualifications than necessary for a specific job) favour upward mobility and penalize downward direction, while undereducation is a factor in demotion (Crespo, Simoes and Moreira, 2013). However, further evidence may lie in the findings that possession of an undergraduate degree does not seem to reduce the risk of unemployment during a recession (Bisello, Maccarrone and Fernández-Macías, 2020). The position of young educated workers, important during periods without many opportunities, is under discussion in Europe due to the data showing that the young are affected more by the crisis. Symeonaki and Stamatopoulou (2020) revealed that Italy, Croatia, Greece, Spain, and Romania presented the lowest positive labour market mobility (from one job position to a better one or from unemployment/inactivity/education to employment status) over this period in Europe. The effects of such shocks are heterogeneous, sometimes accelerating these movements, and certain groups of people have comparative and relative gains while others lose the social status of prior to the crisis. In Greece, compulsory education is not selective, tertiary education is free, vocational training is considerably weak, and high percentages of people prolong their studies and delay their entry into employment. Also given the rigid labour market conditions, this country can be confronted as a case study creating different motives.

We will try to answer the following research questions:
What were the patterns of intra-generational occupational/employment mobility in Greece during the crisis? Are there any potential differences in mobility patterns between the various classifications?
Do individuals' characteristics and overeducation continue to be linked to specific opportunities for occupational mobility and undereducation with risks of downgrading?
What are the characteristics of people who as workers are overeducated compared to people who are appropriately educated workers?

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To our knowledge, very limited empirical research has been carried out regarding this aspect of social mobility in Greece. The main contribution of this paper is that it sheds light on the research of the evolution of intragenerational occupational mobility in Greece during the crisis. The unique contribution is that this study provides empirical evidence that there is a linkage of this aspect of mobility with the phenomenon of overeducation. Moreover, the results do not concern only the changes in professions, but basic changes in professional prestige through the skill levels of professions, changes in wage scales as well as inflows and outflows in the labour market.

The rest of the paper is organised as follows. In section 2, we review the literature regarding occupational mobility and its determinants as well as the background of the sovereign debt crisis in Greece. In section 3 we describe theories about occupational mobility and the challenges in measuring intragenerational mobility. In section 4 we describe the phenomenon of overeducation and characteristics of non-adequately educated workers in mobility patterns. Sections 5 and 6 discuss the data and methodologies used in our analysis. Section 7 presents our main findings with robustness checks. Concluding remarks are found in section 8.

2 THE BACKGROUND OF OCCUPATIONAL MOBILITY DURING AN ECONOMIC CRISIS

The Great Recession in Europe in 2008 disintegrated the labour market in many countries. The unemployment rate increased and the recovery was slow. The effects of such shocks are heterogeneous. They appear to have affected younger employees more, people with temporary contracts and medium-skilled workers, while showing different results across countries and genders (Eurofound, 2017). Also, to be noticed is a "negative job polarization". Many medium-paid jobs have been destroyed, with reference to the mean salaries of each state in relation to the tails of occupational structure. As a result, individuals faced the challenge of reallocating to jobs with remuneration commensurate with their skills, which reduced opportunities for upward mobility (Bisello, Maccarrone and Fernández-Macías, 2020). Moreover, this polarization can affect the career decision of highly qualified people to stay out of employment for a long time anticipating better opportunities or else to relocated abroad. The recent studies about **the impact of a financial crisis** mainly discuss its effects on wages and unemployment rates and whether it amplifies the changes in social stratification. The trends of these changes are less predictable. In similar cases, there is greater labour mobility (Korea) and stagnation in other countries (Japan, US, Estonia) during recessionary periods. On the other hand, a crisis can create opportunities and innovation, because people and organizations are pressed to adapt and survive as internal labour markets are less stable. In Europe, the consequences of the outbreak of the European debt crisis, characterized by abrupt devaluations created a duality between peripheral Southern countries like Italy, Portugal, Spain and Greece with shrinking employment rates and the central Northern European states (Eurofound, 2017; Pohlig, 2021; Symeonaki, Stamatopoulou and Michalopoulou, 2020). **The institutional**

differences among states tend to be crucial for occupational mobility in Mediterranean countries, indicated high levels of stability before the crisis while downward occupational mobility was negligible. The structural features and stricter employment protections in these countries, the significant number of public servants and bureaucratic constraints and severance legislation are the explanation for the previous patterns over time (Bisello, Maccarrone and Fernández-Macías, 2020; Pohlig, 2021). Prior to the crisis these economies were distinguished by their creation of many medium-level occupations and forming a powerful middle class. After the onset of the recession, they tended to become more polarized.

The empirical literature on labour addresses **the determinants of mobility decisions**. The main focus is to find out the magnitude of human capital and the role of the business cycle. During a period of economic growth individuals may be disposed to take risks in their search for jobs and find a post more appropriate to their skills. On the contrary, periods of recession and unfavourable structural changes in the labour market make the job security more attractive, even if the occupation or wages do not match the abilities of the worker. Downward occupational mobility (move to a job with lower status or wage) can result from efforts to avoid unemployment. The increase in fixed-term contracts leads to a higher turnover rate, which influences the mobility figures, especially among women, who tend to be overrepresented in this form of employment. As a result, greater mobility is expected in relation to employment contracts due to labour market deregulation, higher unemployment rates and recession (Crespo, Simoes and Moreira, 2013; Eurofound, 2017; Symeonaki, Stamatopoulou and Michalopoulou, 2012). On the other hand, **the professional lifecycle and career evolution** are also correlated with occupational changes, but the exact influence of age has been disputed in recent literature. Over the years, most people have sought higher wages, a better quality of life, which means better working conditions. This can lead to occupational immobility and substantial returns to experience tend only to mitigate the effects of downward mobility. **Policies** that moderate the negative aftermaths of this period are determined by the duration of the crisis, the control of measures implemented by the government and labour market regimes.

The Greek crisis started in late 2009, but it was in 2010 that the country was unable to borrow from the financial markets when the real debt and deficit figures came to light. The fiscal crisis turned into a sovereign debt crisis. Greece received financial assistance from three creditors: the International Monetary Fund, the European Commission, and the European Central Bank. They lent financial aid to Greece with the agreement of an economic adjustment program which would be modified in 2012 and 2015. The bailout programs required the Greek governments to implement austerity and tough fiscal measures, which included cuts to public spending, social benefits, and public-sector wages, extra social insurance contributions to face the problem of rising unemployment numbers, an increase of indirect and direct taxes, introduction of new emergency taxes and extra charge in self-employed contributions above 100%. These affected the living conditions of

Greek citizens with differing results among different sub-groups (Matsaganis and Leventi, 2014; Kaplanoglou and Rapanos, 2018; Andriopoulou, Karakitsios and Tsakloglou, 2017). According to the OECD (2018) the Greek crisis was the deepest with major impacts on GDP, employment and wages. The third memorandum was concluded in 2018.

3 OCCUPATIONAL MOBILITY: THEORIES AND METHODOLOGICAL APPROACHES

Human capital studies investigating the effects of human capital investment on income have started increasing the attention they pay to labour mobility. The human capital theory argues that people are more likely to choose the occupation that offers the greatest current value of potential future earnings (Dekker, de Grip and Heijke, 2002; Constant and Zimmermann, 2003). Human capital investments can lead to optimal wage returns. However, if individual and societal beliefs about formal education as a mechanism for promoting equality and mobility are misguided, these benefits may be diminished (Capsada-Munsech, 2017). **The theory of career mobility** argues that at entry levels individuals may choose positions with lower returns on education if they believe that the effect of schooling will give them positive opportunities in the future. This theory taking into account both the supply and demand sides considers this mismatch as economically prudent at the beginning of a working career, as a short-term situation (Büchel and Mertens, 2000).

The common methodological approach for exploring occupational and employment mobility involves the use of **transition probability matrices**. It is suitable when the researcher based on categorical scale, the International Classification of Occupations (ISCO) for instance. The detailed occupational scheme takes into account the cumulative human capital required for a particular job and creates distinct segments of the labour market (Eurofound, 2017; Katsimi et al., 2013; OECD, 2018). In mobility terms based on occupational classification of the profession, an upgrading means that an individual moves from a lower-skilled profession to a higher one. As well as for occupational classification, it is also common to examine **labour market flows between jobs with wage differences**. This approach uses the salary as a signal for the quality of the job. This analysis derives from the fact that wages are also linked to the levels of consumption that affect the standard of living of workers. By putting workers with similar pay levels into groups of approximately similar sizes (occupations being ranked by the average monthly earnings), insights into occupational mobility are enriched (Bisello, Maccarrone and Fernández-Macías, 2020; Crespo, Simoes and Moreira, 2013). In terms of average wages, occupational upgrading means that high-paying, prestigious jobs are increasing in number relative to medium-paying jobs, and there is a shift towards these higher-paying positions. **Wage polarization** is described as an increase in high-wage and low-wage jobs awhile mid-wage jobs drop out (Eurofound, 2017; Pohlig, 2021). The limitation of the second approach is that it is not identical among the recent studies as the allocation of occupations in quantiles may not be the same over the given years or among different researchers.

To explore the patterns of **employment mobility** during recession periods, researchers include **unemployment as an additional level/category in the transition matrices**. In this way, they tried to gauge the implications of economic shocks on employees' life chances. The interpretation is that moving from a specific job to unemployment is considered downward mobility in the mobility grid. The absence of flows or flows to low-wage employment or specific occupations creates a two-speed labour market. On the contrary, movements across the occupational distribution reveal greater mobility possibilities, which may contribute positively to the economic impact of society (Bisello, Maccarrone and Fernández-Macías, 2020). One of the features of traditional mobility approaches is that **we assume that all transitions are equally important**. Apparently, the transition from one skilled level to a lower one differentiates the transition from employment to unemployment or maintaining employment stability does not mean the same with persistent unemployment. Symeonaki, Stamatopoulou and Michalopoulou (2020) suggest that it should only assess positive movements when considering labour market mobility. In essence, these good transitions imply a labour market with greater opportunities. Favourable transitions are the transition from unemployment or inactivity to employment in which the opposite direction is undesirable.

4 THE PHENOMENON OF OVEREDUCATION

The expansion of education and the improvement of educational outcomes in recent decades for young generations in advanced countries has triggered the debate about overeducation. Overeducation is defined as a mismatch between workers' educational backgrounds and the requirements necessary to perform the average job. An overeducated employee is a person whose skills and qualifications exceed the skill level of an occupation (Erdsiek, 2021). Educational expansion does not necessarily lead to overeducation. This depends on the demand for high-skilled jobs required for educated people and the number of them in the labour supply. This will depend on the demand for high-skilled jobs from firms and the availability of highly educated workers in the labourpool. The issue of overeducation does not mean that the expansion of education has been a negative evolution, or a state does not need so many well-educated individuals. They are essential for economic growth. This inadequacy means that the quality of education and the target of education systems must be more labour market-oriented and technology-driven (Patrinos, 1997). Suboptimal allocation of educated workers or the inefficiency of an economy to absorb these people also affects the economic growth of a country for it will lose valuable human capital due to inadequate jobs or immigration (European Commission, 2020). According to the human capital theory introduced by Becker in 1964, overeducation occurs because of a temporary mismatch in the labour market. To address this problem, the willingness of companies to fully utilise the skills of educated people and the efforts of more educated individuals to find more suitable work will improve the situation rapidly. The hypothesis of maximizing utility and homogeneity on both sides does not take into account the different preferences and incentives of individuals and businesses. Therefore, the solution is the adjustment of individuals and firms. The model of Thurow in 1975 about job competition theory analysed overeducation as a persistent

phenomenon in which workers are ranked hierarchically in a queue depending on their qualifications and compete for the best jobs. This creates incentives for educational investments and promotes credential inflation. Overqualified people are also allocated to the highest occupations and new job positions need to be created, it being the responsibility of the demand side to create them (Capsada-Munsech, 2017). **Other theories (assignment theory and career/job mobility theory)** consider individuals' preferences on specific sectors, jobs, wage threshold, etc. and the difficulty to signal their skills properly, prove that the occurrence of overeducation is a more complex issue and each theory has something to add in the understanding of the situation. Overeducation can be temporary or permanent.

The **matching studies** between jobs and qualifications of the workers support the view that overeducation can be a temporary situation at an individual level but a permanent phenomenon for the economy (Patrinos, 1997; Zhao et al., 2017). Dekker, de Grip and Heijke (2002) indicate that overeducation is more likely to lead to upward mobility, which being translated means that it is a temporary situation at the individual level. Sicherman's (1991) work that had positive conclusions about the future of overeducation was later on disputed. Overeducation can be a temporary or long-term structural condition. If it affects the prospects of well-educated people, actions need to be taken analogous to the duration of the incidence. In addition, the business cycle of the economy exacerbates the mismatch between workers and jobs. During the recession, this mismatch worsened and the numbers of overqualified workers increased.

The incidence of overeducation emerges when comparing the level of education with **an indicator of the typical requirements** for an occupation in terms of educational background needed. The first one is straightforward (labour economists tend to measure the role of education by using the years of schooling or the highest level of attainment) but the second part has been criticised about how objective or subjective it is. The subjective approach is through individuals' opinions about the connection between their job requirements and their educational background. The objective approach is obtained when we measure this mismatch with an indicator set by an acknowledged authority or organization. The former has been characterised as unreliable due to the arbitrariness of these measures, and as a result the latter is preferred (Patrinos, 1997). In those cases where formal education and training requirements are used as part of the measurement of the skill level required for an occupation, these requirements are defined in terms of the International Standard Classification of Education (ISCED). A mapping between ISCO-08 skill levels and levels of education in ISCED-97 is provided in table 1 (ILO, 2012). Based on the mapping between ISCO skill levels[1] and levels of education in ISCED the term overeducated can be applied to people whose level of

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[1] EU-SILC (European Union Statistics on Income and Living Conditions) datasets used ISCO-08 to describe the occupation of the responders. The nine occupational classes are shown in table 1. Following the group definitions of International Labour Office (ILO), they arrange occupations in skilled groups as the second column presents (ILO, 2012; Pohlig, 2021).

education exceeds the formal educational level required for a given occupation. For instance, a person who is working as a service and sales worker, if she/he has a tertiary degree is overeducated while someone who has completed secondary education is an adequately matched worker. Someone who has completed only primary education is considered undereducated.

TABLE 1

Mapping of ISCO-08 major groups to skill levels and skill levels to ISCED-97 levels of education

ISCO-08 major groups	Skill level	Levels of education
1. Managers, senior officials and legislators	4	Second stage of tertiary (leading to an advanced research qualification)
2. Professionals		First stage of tertiary education, first degree (medium duration)
3. Technicians and associate professionals	3	First stage of tertiary (short or medium duration)
4. Clerks	2	Post-secondary, non-tertiary
5. Service and sales workers		
6. Skilled agricultural and fishery workers		Upper secondary
7. Craft and related trades workers		
8. Plant and machine operators, and assemblers		Lower secondary
9. Elementary occupations	1	Primary

Source: ILO (2012).

The question is to what degree the labour market can create high-skilled job opportunities for the increasing number of educated workers so that the individual's investments and the state's investments in education will not be lost. To assess these efforts, it is important to focus not only on wage returns but also on other aspects of working conditions that matter to employees: the degree of autonomy, the prestige, the working environment. Interestingly, past studies have shown that overqualified individuals have lower motivations and productivity than those with the same qualifications but are appropriately matched (Capsada-Munsech, 2017). With regard to the field of study, it was also pointed out as a factor to predict whether the individual will experience overeducation. Patrinos (1997) raised concerns about how the phenomenon of overeducation in Greece might evolve if the public sector stopped absorbing graduates, especially from faculties without many alternatives (such as the humanities and social sciences) and about what would happen during a recession of the Greek economy. These graduates tend to acquire general knowledge but not practical skills and find transfer to different occupations difficult. In some segments of the economy, workers who have received vocational training can readily meet the demands of their jobs. In other cases, overeducation may be acceptable at entry-level as the years of experience and in-job training will lead to internal promotions or better opportunities in the same

employment sector (Dekker, de Grip and Heijke, 2002). International labour mobility is one of the benefits of European integration. The EU can be developed by reallocating highly skilled workers through intercultural tolerance that drives innovation, but this should not happen at the expense of the poorest/underdeveloped countries. This transition must be bilateral rather than unilateral.

The hypotheses on the effects of education and overeducation on intragenerational mobility described above are given below:

(a) Tertiary education and overeducation have a positive effect on intragenerational occupational mobility in the Greek labour market.

(b) The changing reality of the labour market during the crisis implies that the effects of an extra degree can produce debateable results.

(c) The effects of such shocks are heterogeneous. Sometimes these economic shocks accelerate them and some groups of educated people have comparative and relative gains while others lose their pre-crisis social status.

5 DATA AND LIMITATIONS

In this section, we describe the dataset and variables used in the analysis, along with the rationale for our decision. We use the European Union Statistics on Income and Living Conditions (EU-SILC) survey between 2011-2019 (Eurostat, 2024)[2] due to changes from the ISCO-88 version (up to 2010) to ISCO-08 (since 2011). This is the first limitation of the data to explore a longer period. We create two different datasets, civilian labour force who remain in the sample for 2 years between 17-67 years old, creating transition matrices for people who work excluding armed forces jobs. We have excluded pupils, students, men in a compulsory military community or service, people in retirement or in early retirement, individuals who are permanently disabled or/and unfit to work, women with fulfilling domestic tasks and care responsibilities and other inactive persons. Numerous previous studies have used the EU-SILC dataset (Symeonaki, Stamatopoulou and Michalopoulou, 2012; Whelan, Nolan and Maître, 2012; Eurofound, 2017). This dataset uses ISCO-08- 1 digit as occupational classification (without giving more detailed information for each subcategory-second limitation). According to European Commission (2014) Greece use only ISCO as the national socio-economic classification. Symeonaki, Stamatopoulou and Michalopoulou (2012) classified the occupations into 4 categories – elementary occupations, skilled manual, lower-skilled non-manual, higher skilled non-manual. The drawback is that they used occupational rather than skill categories. We can't adopt this approach due to its being inaccurate to suppose that skilled manual occupations are inferior to lower skilled non-manual and a movement from one class to another is an indicator of upward or downward mobility.

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[2] The year 2011 can be characterized as the year in which EU-SILC survey informs us about the situation on income mobility before the first economic adjustment program applied due to the data referred to the previous year. Therefore, the 2011 module included information about households and individuals who were interviewed in 2010 and declared their income for this year. Therefore, the effects of the first memorandum policies had not had any impact. Further, 2019 can be characterized as the year which informs us about the situation at the end of the bailout programs.

We have chosen to analyse occupational and employment mobility year on year for the sample of persons mentioned in each approach. The analysis requires valid information on the classification used to construct occupational mobility. For this reason, we based our analysis on the skill level classification[3] (table 1) as well as the job wages tiers (appendix table A1). The second approach of our analysis requires a wage criterion to rank occupations. We use the common method of average annual salary. The income from work corresponds to an index of the job quality as we mentioned in previous subchapter. Table A1 in appendix shows the ranking of the occupations from the highest quality tiers to the lowest paid, considering average wages in both years. We follow the OECD (2019) definition of the middle class of income. It defines as "middle-income class" incomes ranging between 100% and 150% of medium. Correspondingly, the upper-middle class includes incomes between 150% to 200% of medium and lower middle-incomes class (75% to 100% of medium). By calculating the average wage for each occupational category and comparing it with the medium income for that year (10,985€), the nine occupational categories are subdivided into three groups: Lower middle-income: 8,238.75€ – 10,985€, Middle middle-income: 10,985€ – 16,477.5€ and Upper middle income: over 16,478€. The division is robust because the mean income of each category corresponded between the limits that applied in both years 2011 and 2019. Both approaches respond to the necessity of ranking indicators that allow the estimation of occupational indices as reliable measurable classifications. The respective employment mobility measured in skill levels added unemployment as an additional category (appendix table A2). We assume that a movement from a skill level to unemployment is a downward movement and from unemployment to any skill level as upward mobility. The sensitivity of our index is to assume that unemployment is the lowest level of occupational classification. The three different classifications are offered for immediate confirmation of the results (a direct robustness check). However, in order to evaluate factors of the Greek economy which may affect mobility we need more detailed individual characteristics in national data (such as the areas in which people live, more detailed occupational information).

6 METHODOLOGY
To summarise, in order to answer the research questions, we use the following statistical and econometric tools.

6.1 ABSOLUTE MOBILITY INDICES
To establish specific patterns of mobility during the three bail-out programs we use absolute mobility indices. Absolute mobility indices measure the total number of people who change to an occupational level higher than their previous job (upward mobility) or whose new job is lower in the occupational hierarchy than the older one (downward mobility) or whose previous and current jobs have the same occupational prestige (immobility). The sum of the previous ratios is equal to one (Symeonaki, Stamatopoulou and Michalopoulou, 2016; Eurofound, 2017).

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[3] How skill levels are defined: the nature of the work performed in an occupation with respect to the characteristic tasks and duties defined for each ISCO-08 level. The level of formal education required for the competent execution of the relevant tasks. The amount of informal on-the-job training and/or prior experience in a related position necessary for the competent performance of duties (ILO, 2012).

The following equations estimate the absolute mobility indices:

$$Upward\ Mobility = \frac{1}{N} \sum_{j>i} n_{ij} \qquad (1)$$

$$Downward\ Mobility = \frac{1}{N} \sum_{j<i} n_{ij} \qquad (2)$$

6.2 MULTINOMIAL LOGIT ANALYSES

To investigate the effects of a set of individual and job-related characteristics on mobility patterns, using multinomial logit analysis is employed. Using multinomial logit analyses with regard to upward and downward mobility, we define three possible states: not mobile (the reference category), upwardly and downwardly mobile following a model suggested by Plewis and Bartley (2014).

The multinomial logit models have a dependent variable that is a categorical, unordered variable (Stawarz, 2018). The choices/categories are called alternatives (1, 2, ..., m).

As a multiple logit thus ignoring the ordering using mlogit in Stata[4]:

$$\log[\frac{\pi_m}{\pi_M}]m = 1. . . \ M - 1 \qquad (3)$$

where M is the reference category and π is the probability of being in category m.

The explanatory variables consist of a set of individual-specific characteristics such as marital status, age and sex, human capital is captured by the completion of tertiary education (binary variable of completion or not this level of education), years of experience and whether the worker is in educational training as well and dummy variables for over- or undereducated. The overeducation captured as a dummy variable comprises overqualified workers who have completed tertiary education and the undereducation captured as a dummy variable comprises underqualified workers who have completed secondary education. The coefficients of other alternatives are interpreted in reference to the base outcome.

6.3 LOGIT REGRESSION

This step is to examine the determinants of overeducation in Greece, using a logit regression which explores the characteristics of people who are overeducated workers compared to people who are adequately educated workers.

Logit estimation is performed with a dichotomous dependent variable indicating mobility (Crespo, Simoes and Moreira, 2013; Sicherman and Galor, 1990):

Log[Prob(being overeducated)/Prob(adequately educated)]it = $X_{it}\beta + \varepsilon_{it}$ (4)

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[4] Stata is a complete, integrated software package that provides all your data science needs-data manipulation, visualization, statistics, and automated reporting.

Logit regression: Dependent variable = 1 if the worker is overeducated, 0 if he/she is adequately educated- correctly allocated workers, undereducated workers excluded while X is a vector of variables including individuals' characteristics and family background variables (parental education and occupation). We used data from people who remained in the sample for 2 and 4 consecutive years to check both temporary and long-term overeducation. Logit regressions fit the model for a binary response by maximum likelihood using robust standard errors.

Finally, a statistical approach for presenting the incidence of overeducation during the previous decade. We check the unmatching between the supply and demand side in the labour market.

7 RESULTS

7.1 CHANGES IN INTRAGENERATIONAL OCCUPATIONAL MOBILITY DURING THE CRISIS

Dividing this period into three parts according to the bailout programs (in 2010 the first, in 2012 the second and in 2015 the third) the absolute mobility indicators present specific patterns regardless of the type of classification. The changes occurred during the first 4-5 years of the crisis (until 2015-2016, the first 2 bailout programs) while noticeable after that is an adjustment to the reverse of the distribution at the beginning of the crisis. Figure 1 (appendix table A3) plots the upward and downward occupational mobility. We can see that downward mobility rates (people who moved from a higher-skill to a lower-skill level occupation) overtake upward mobility percentages (people who moved to a higher-skilled job) until 2015. The rate of downward movements peaked at the beginning of the crisis at 10.14%. A different pattern applies after 2015 when the absolute mobility rates are higher. Moreover, total mobility rates (both upward and downward) are higher during the first memorandum (lower immobility rates). Along similar lines, the same pattern exists if we see the absolute mobility rates of paid jobs classification. The percentages of both directions are low compared to the previous classification, but the changes among the periods remain similar (figure 2 and appendix table A4). Small differences occurred with respect to employment mobility. Figure 3 (appendix table A5) shows that the effects of the crisis had started earlier in Greece, the official percentage rates having increased from 2008. A slight decline in unemployment rates started after the second bailout program. Following this approach, the downward mobility rates continue to be higher than upward percentages during the first memorandum but this changed during the second one and not after the third one as the previous specifications revealed. However, taking into account the people who were stuck in unemployment in our sample it can be noticed that the percentages of these individuals follow an upward trend from 17.89% in 2011 to 24.26% in 2015 and a steady decline later, proving that the normalization of the labour market took place mainly after 2015. In the transition tables (appendix tables A6-A9), it is noticed that the downward trend in mobility before 2015 represents mainly movements from the skill level 3 (technicians and associate professionals) to skill level 2 occupations (a sharp increase of service workers). Therefore, there is a polarization in the middle. The majority of

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people are working in occupations with skill level 2 (appendix table A10). The previous analysis referred to people aged 17 to 67 who are active in the labour market at the beginning and at the end of each specific period or looking for a job. To check the robustness of these patterns, we re-estimated the absolute mobility rates for a different age range (30-60 years old) with similar results (appendix figures A1 and A2).

Figure 1

Patterns of intra-generational occupational mobility (skilled levels) across the 3 bailout programs (in %)*
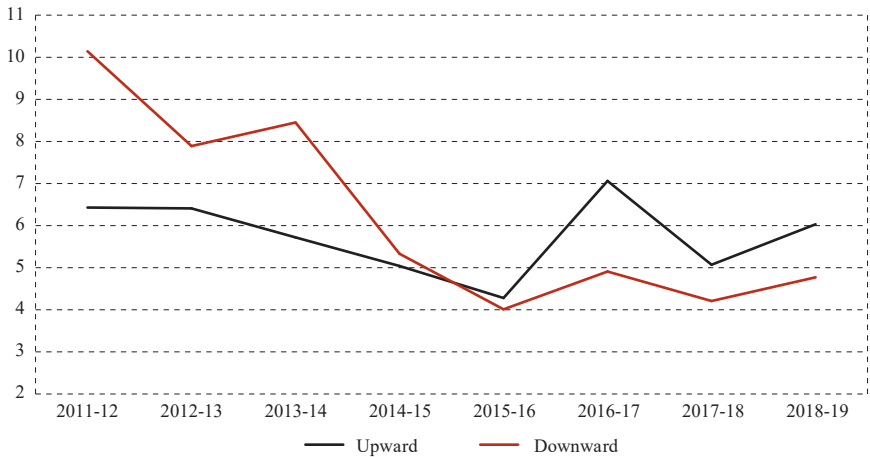
*Absolute occupational mobility (workers 17-67).
Source: Analysis of cross-sectional and longitudinal microdata from the EU-SILC survey (authors' calculations).

Figure 2

Patterns of intra-generational occupational mobility (paid-job tiers) across the 3 bailout programs (in %)
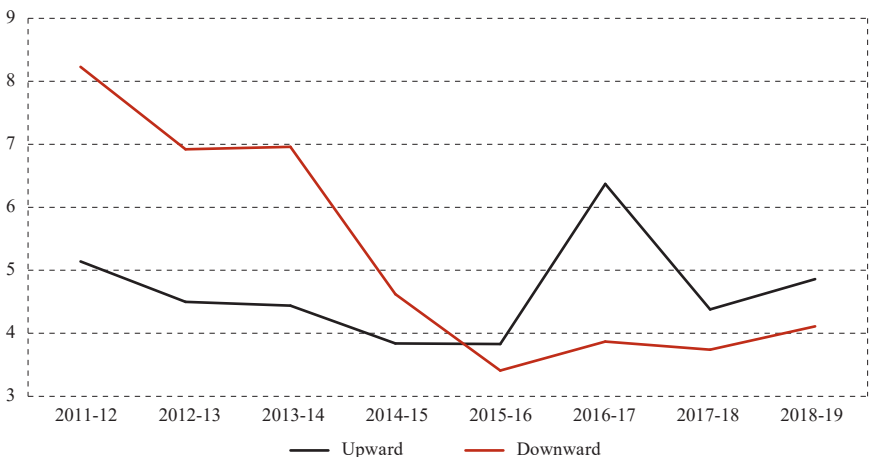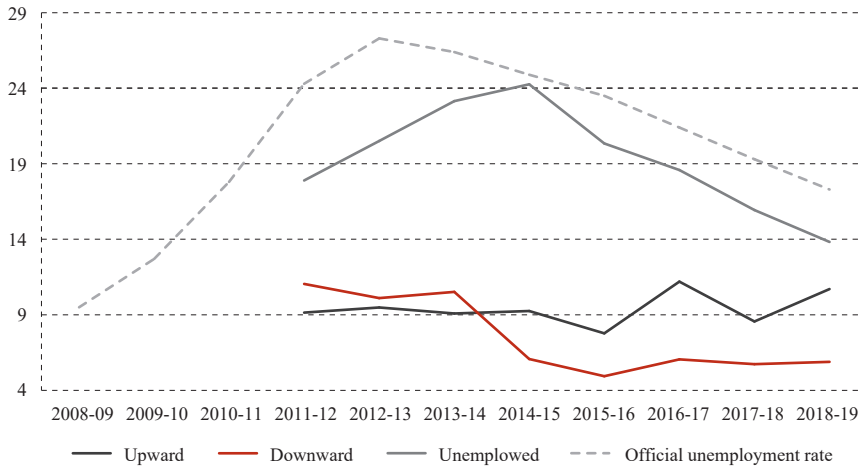

Source: Analysis of cross-sectional and longitudinal microdata from the EU-SILC survey (authors' calculations).

FIGURE 3

Patterns of intra-generational employment mobility (in %)

Source: Analysis of cross-sectional and longitudinal microdata from the EU-SILC survey (authors' calculations).

The previous findings show a differentiation in the effects of the memorandums on the labour market. During 2011-2015, as a result of hight unemployment, many workers also experienced downward occupational mobility. We recall that the main policies implemented were the following: cuts in public wages and unemployment insurance benefits above 20%, extra social insurance contribution, increase of indirect taxes (like VAT) by 10%, rise of direct taxes (like personal income taxes), introduction of new emergency taxes, extra charge in self-employed contribution above 100%. About employment contracts, flexible forms of employment (non-standard work, temporary contracts) were expanded while severance regulations ceased to be strictly applied (Galata and Chrysakis, 2016; Koutsampelas and Tsakloglou, 2013). After 2015, when the 3rd bailout program began, the mobility patterns become more positive. More workers were experiencing upward mobility, fewer people were stuck in unemployment, and more people were finding work. This does not necessarily mean that the policies pursued during the third program were necessarily positive with respect to the labour market (additional increase of social insurance contributions, changes in personal income taxes and solidarity taxes, introduction of guaranteed minimum income and a social dividend paid to payees, changes in social benefits like child and large family benefits while tax credits for employees stopped). Nor does it mean that the new government corrected the mistakes of the previous ones. It is possible that the disintegration of the labour market that emerged from the crisis and the memorandums had reached a peak in 2015 when there were still political forces in Greece arguing that there were solutions outside the European Union. When the third memorandum was signed (the only one that was finally completed) the country seemed to have entered a period of stability, which had a positive impact on the labour market as well whereas the "voices" that proposed easy solutions ceased (Varvitsioti and Dendrinou, 2019; Hope, 2015; Tsebelis, 2015).

When comparing our findings with those of Pohlig (2021), it becomes evident that the immobility rates are notably high, despite a decrease during the economic crisis. Our research reveals distinct patterns when the period of the crisis is isolated. Greece exhibits similar trends to countries such as Iceland, Ireland, Latvia, Malta, and Slovakia. Furthermore, Mediterranean countries displayed comparable patterns. There are similarities to the high immobility rates in Italy (Bison, 2011). Contrasting our findings with other studies examining countries outside of Europe during periods of economic crisis or stagnation, it is observed that Greece demonstrates higher immobility rates than Korea and Japan (Choi, 2016; Yu, 2010). However, as in the case of the USA, the results indicate lower occupational mobility rates during recessions. Occupational mobility tends to be higher during recovery and economic boom periods, and lower during recessions (Roosaar, Mõtsmees and Varblane, 2014). Regarding paid jobs classification when comparing our results with those from other EU countries during the Great Recession, the differential impact on mobility is evident. Some countries, such as Sweden and the United Kingdom, sustained high levels of mobility, while others, including France and Italy, exhibited lower levels of mobility, which were further diminished by the crisis. The findings for Greece align with those for France and Italy (Bisello, Maccarrone and Fernández-Macías, 2020). Finally, with respect to employment mobility, a distinctive pattern emerged with an increase in mobility rates, specifically during the initial phase of the crisis.

Next, we continue our analysis by estimating the direction of these movements across job quality levels measured by the average salaries of each occupational level during the crisis. Between 2011 and 2016 medium-paid jobs increased from 56% to 61% while high-paid jobs declined from 22% to 18%. Since 2016 more high-paid jobs have been created and the situation before the crisis established again (figure 4). The mobility rates in figure 5 treat distance mobility, for example from high-paid jobs to medium-paid occupations is the dominant movement between 2011-2014, the same as incremental advancement, for example from medium-paid jobs to low-paid jobs. The opposite direction from bottom-medium wages levels to upper occupations occurred after 2015. Middle-income economies witnessed occupational upgrading, particularly in medium-level occupations (Pohlig, 2021) a phenomenon not indicated by our results. Furthermore, in contrast to previous research indicating that the Great Recession resulted in job polarization and a net loss of mid-paid jobs in certain countries, Greece experienced a modest increase in such jobs (Bisello, Maccarrone and Fernández-Macías, 2020). The crisis had a particularly severe impact in Spain, leading to the destruction of mid-paid jobs.

FIGURE 4

The distribution of wage-job levels between 2011-2019 (in %)
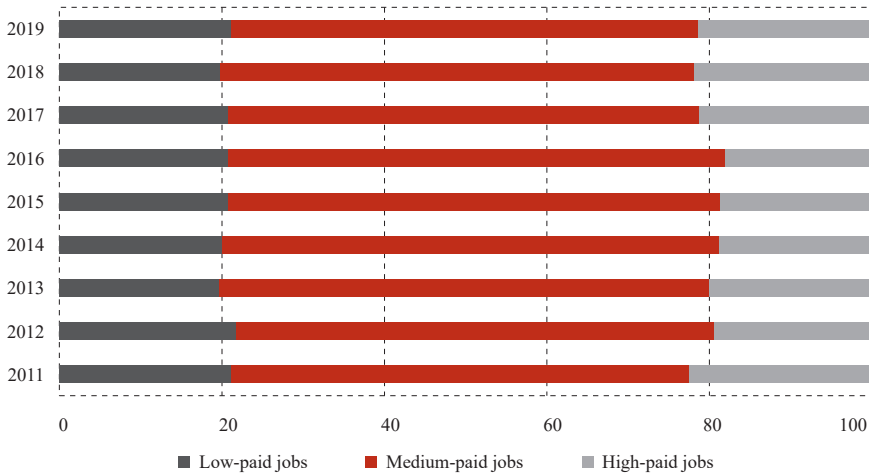
Source: Analysis of cross-sectional and longitudinal microdata from the EU-SILC survey (authors' calculations).

FIGURE 5

The direction of movements across the wage-job levels (in %)
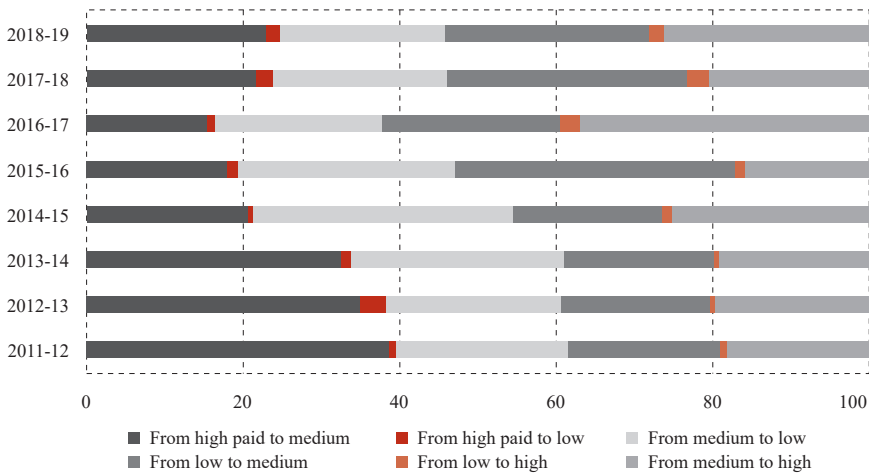
Source: Analysis of cross-sectional and longitudinal microdata from the EU-SILC survey (authors' calculations).

7.2 THE EFFECTS OF INDIVIDUAL AND JOB-RELATED CHARACTERISTICS ON MOBILITY PATTERNS

The review of the existing literature showed that there is significant variation in labour market mobility within employment across different members of society. For this reason, we will discuss the results of the multivariable model in which the effects of a set of sociodemographic characteristics on mobility patterns are analysed. Specifically with mobility as a dependent variable, the multinomial dependent variable has 3

categories/alternatives: from an upper skilled level to middling or lower, from lower-skilled level to upper and persistence. Persistence in the same occupational status (that is, absence of mobility) is used as a reference category so that the probabilities of transitions between different skill-level occupations are calculated and the coefficients of the multinomial logistic regression expressed as marginal effects can be interpreted as a relative chance/risk of a particular transition. The model is run separately for different periods. In a world of equal opportunity, differences in occupational opportunities should be derived from personal preferences only, *ceteris paribus*. In this section, the emphasis is on the role of main individual characteristics (age group, gender, education, marital status) as well as job related characteristics (years of experience, overqualification and underqualification, training and education during the professional lifetime).

Tables 2 and 3 show the results of multinomial logit analyses with regard to downward and upward mobility. Starting with downward mobility, the most interesting evidence is that the completion of tertiary education increases the possibilities for downgrading in terms of occupational level. The "all years" estimations results reveal that downward mobility in the labour market is significantly higher for tertiary graduates than occupational immobility. These probabilities are higher in the first period of the crisis and statistically significant in all periods, with the exception of 2013-14. Along similar lines, a tertiary degree is less likely to lead to upward occupational mobility (table 3). This significant effect contradicts traditional human capital theories, which emphasise the effectiveness of human capital investments for workers who had completed tertiary education with regard to possibilities for the direction of occupational mobility. The fact that bachelor and higher degrees are not linked with greater mobility is the first signal of overeducation in Greece during the last decade. In addition, the outcomes obtained from the meticulous regressions showcase results that are incongruent with the predictions set forth in hypothesis (a), prompting a reconsideration of the proposed relationship between tertiary education and this aspect of mobility.

On the other hand, overeducation indicates the expected positive effect on upward and downward mobility focused on overqualified workers who have completed tertiary education. Overqualified workers tend to be more mobile upwards, mainly during the first period of the crisis (figures 6 and 7). Taking these results together indicate that this level of education is not sufficient to protect workers from experiencing downward occupational mobility during a crisis period but can boost the upward possibilities for overqualified workers to find an adequate job to their own skill levels. And it confirms the hypothesis that the changed character of the labour market during the crisis can have contradictory results about the effects of an extra degree. As expected, undereducated workers with secondary education have higher chances of moving downward in the occupational strata and less chances to experience upward mobility (already working in a job where their qualifications fall short of the qualifications required). The empirical findings elucidated through the regression analyses contribute substantial and compelling support for hypothesis (b).

To capture differences between men and women we include the sex variable which takes the value of 1 if the respondent is female and 0 if male. In the case of absence of discrimination and segregation, we would expect to find no significant gender differences in occupational distributions. Indeed, females presented no significant differences to men in the majority of years and in both directions of mobility. The same thing was noticed about marital status as well. Consistently with the traditional theory of career mobility, younger people have lower chances of mobility than people between 30-50 years old[5]. The age after 30 is considered crucial about the decision of mobility due to the fact the person has completed the education and training needed for a specific field of occupations and has obtained the experience which allows him to search for the ideal career. Surprisingly, older workers are the most mobile within occupational classes, although in many cases the marginal effects are not statistically significant. The analytical results derived from these sub-groups affirm the tenability of hypothesis (c).

Each year of experience reduces the likelihood of a downward move but it is also clear that it also negatively affects the possibilities for upward occupational change. We assume that additional years of experience lead workers to an adequate job linked to their preferences and for this reason to immobility. However, it is worth noting that even highly significant coefficient of this variable, are very low, and this diminishes the importance of this factor. Finally, as anticipated, current education, simultaneously with working, affects the ability to gain promotion in occupational levels and offers a kind of protection regarding downward mobility.

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[5] Middle age group 30-50 is excluded to serve as reference category.

TABLE 2
Estimations of downward mobility#

From upper skill level to middling or lower	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19
Marital	-0.004	-0.001	0.015	-0.001	-0.003	0.001	-0.001	-0.007**
	(0.010)	(0.008)	(0.013)	(0.005)	(0.003)	(0.003)	(0.003)	(0.003)
Female	-0.012	-0.006	-0.014	-0.001	-0.002	-0.005*	-0.002	0.015***
	(0.009)	(0.007)	(0.013)	(0.005)	(0.003)	(0.003)	(0.002)	(0.003)
Tertiary	0.075***	0.050***	0.060	0.030***	0.028***	0.040***	0.036***	0.037***
	(0.009)	(0.008)	(0.037)	(0.005)	(0.003)	(0.003)	(0.002)	(0.003)
Overqualified × tertiary	-0.177***	-0.187***	-0.107***	-0.080***	-0.071***	-0.081***	-0.071***	-0.084***
	0.034	(0.039)	(0.019)	(0.013)	(0.009)	(0.007)	(0.007)	(0.009)
Underqualified × secondary	0.176***	0.149***	0.195	0.085***	0.067***	0.080***	0.062***	0.069***
	(0.013)	(0.015)	(0.912)	(0.008)	(0.006)	(0.006)	(0.004)	(0.005)
Years of experience	-0.001***	0.0001	-0.001	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
	(0.0006)	(0.0004)	(0.0009)	(0.0003)	(0.0002)	(0.0002)	(0.0001)	(0.0002)
Current education	-0.089*	-0.004	-0.066	-0.005	-0.030*	-0.006	-0.007	-0.006
	(0.045)	(0.025)	(0.043)	(0.016)	(0.017)	(0.011)	(0.009)	(0.010)
Young (17-30)	-0.020*	0.034**	-0.004	-0.005	-0.008**	-0.001	-0.003	-0.005
	(0.012)	(0.017)	(0.025)	(0.007)	(0.003)	(0.005)	(0.004)	(0.004)
Old (50-67)	0.009	-0.004	-0.014	0.002	0.015***	0.005	0.008**	0.008*
	(0.014)	(0.009)	(0.012)	(0.007)	(0.005)	(0.004)	(0.004)	(0.004)

#*Marginal effects from multinomial logistic regressions, mobility as dependent variable.*

The symbols *, ** and *** denote statistical significance at 10%, 5% and 1%. Robust standard errors in parentheses.

Source: Analysis of cross-sectional and longitudinal microdata from the EU-SILC survey (authors' calculations).

TABLE 3
Estimations of upward mobility

From a lower skill level to an upper	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19
Marital	-0.008	0.022***	-0.001	-0.001	-0.003	0.002	-0.005	-0.002
	(0.009)	(0.008)	(0.005)	(0.005)	(0.004)	(0.004)	(0.003)	(0.004)
Female	-0.001	-0.016**	-0.001	-0.001	-0.004	0.002	0.007**	0.005
	(0.008)	(0.007)	(0.018)	(0.005)	(0.003)	(0.004)	(0.003)	(0.004)
Tertiary	-0.026**	-0.004	-0.003	-0.004	-0.056***	-0.046***	-0.055***	-0.020***
	(0.012)	(0.010)	(0.065)	(0.007)	(0.006)	(0.006)	(0.005)	(0.006)
Overqualified × tertiary	0.098***	0.109***	0.047	0.069***	0.057***	0.085***	0.083***	0.066***
	(0.014)	(0.012)	(0.918)	(0.007)	(0.007)	(0.007)	(0.006)	(0.007)
Underqualified × secondary	-0.017	-0.071	(-0.047)	-0.016	-0.034*	-0.094***	-0.044***	-0.054***
	(0.022)	(0.045)	(0.107)	(0.021)	(0.020)	(0.030)	(0.015)	(0.019)
Years of experience	-0.001**	-0.001	-0.001	-0.001	-0.001***	-0.001	-0.001***	-0.001***
	(0.0005)	(0.001)	(0.001)	(0.001)	(0.0002)	(0.001)	(0.0002)	(0.0002)
Current education	-0.067	0.051**	0.014	-0.016	-0.007	0.015	0.019**	0.004
	(0.056)	(0.021)	(0.027)	(0.022)	(0.014)	(0.014)	(0.008)	(0.013)
Young (17-30)	-0.034***	-0.009	-0.012	-0.018***	-0.002	-0.008	-0.008**	0.001
	(0.008)	(0.011)	(0.241)	(0.006)	(0.004)	(0.007)	(0.003)	(0.007)
Old (50-67)	0.014	-0.010	0.002	-0.005	0.010**	-0.007	0.015***	0.004
	(0.013)	(0.009)	(0.042)	(0.007)	(0.005)	(0.005)	(0.004)	(0.006)
Obs.	3,501	3,511	4,614	5,912	9,894	13,965	14,898	11,379

The symbols *, ** and *** denote statistical significance at 10%, 5% and 1%. Robust standard errors in parentheses.
Source: Analysis of cross-sectional and longitudinal microdata from the EU-SILC survey (authors' calculations).

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FIGURE 6

Coefficients for educational variables of downward mobility with standard deviations (reference group immobility)

Source: Analysis of cross-sectional and longitudinal microdata from the EU-SILC survey (authors' calculations).

FIGURE 7

Coefficients for educational variables of upward mobility with standard deviations (reference group immobility)
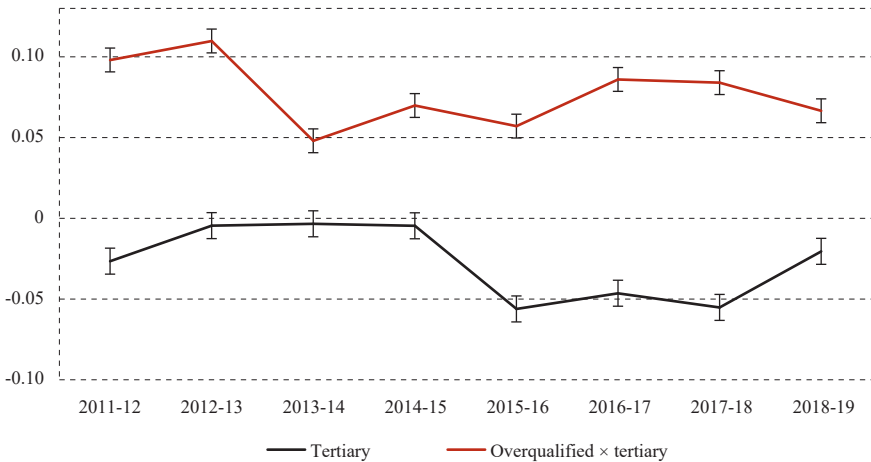
Source: Analysis of cross-sectional and longitudinal microdata from the EU-SILC survey (authors' calculations).
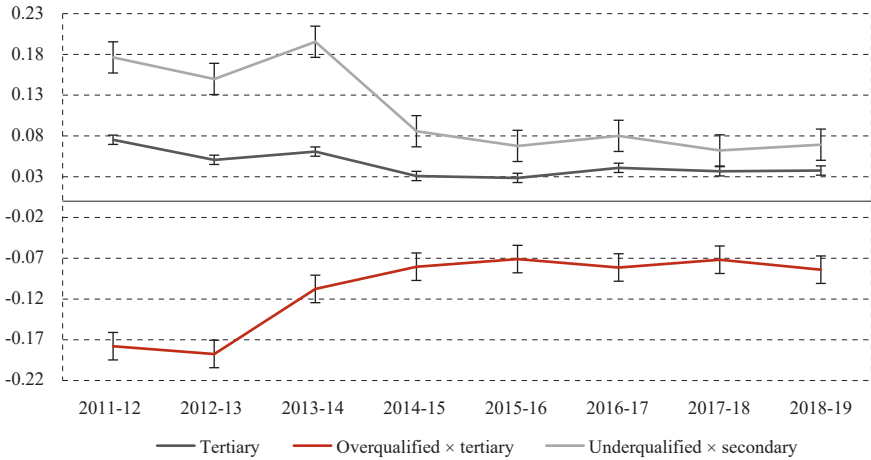
Robustness check: To allow for upward and downward mobility for all persons, data was limited to 2nd and 3rd skill levels excluding those who were positioned at the top or bottom level of the respective position measure in the base year (appendix table A11). We took a particular interest in the role of education in mobility. The interpretation of the results shows that tertiary education did not offer protection against downward mobility and tertiary graduates have more chances of

moving downward and fewer to indicate maintenance of level during the crisis. The findings are more pronounced and clearer between 2011-2015. The overqualified were protected mainly against downward movements but we do not find in this case that they had more possibilities for upward movements than appropriately qualified workers. On the contrary, overqualified workers tend to indicate more persistence and this is a negative sign that overeducation is not a "waiting room" but more possibly a trap. The disadvantage of less-educated workers with respect to mobility has a declining trend during this crisis. It seems to have had less effect than the other two categories. Their potential for downward mobility diminishes and the probability of persistence increases. Contrary to findings in Europe, which indicate that women in most countries face a higher risk of downward mobility (Bisello, Maccarrone and Fernández-Macías, 2020), our research shows that women exhibit higher immobility than men. Our findings align more closely with the situation in Sweden, which is an exception in this regard. Regarding upward mobility, Greece shows similarities to France and Italy, where gender does not significantly impact job mobility. However, in other EU countries, women experience negative effects on upward mobility. In Europe, individuals under 30 are the most mobile within employment across all countries, particularly in Sweden and the UK, in comparison to middle-aged workers.

7.3 OVEREDUCATION IN GREECE AND THE CHARACTERISTICS OF OVERQUALIFIED EMPLOYEES

The crisis and the educational expansion exacerbated the incorrect matching between workers and jobs. Despite the concerns about the possible imbalance between tertiary educational expansion and the lower proportion of job positions in high-skilled jobs in the previous 10 years, Greece experienced a dramatic increase in the percentage of young workers holding bachelor degrees (ISCED 5-8). Analysis of Eurostat data illustrates a comparison between the educational attainment of employed individuals and the share of skilled jobs by year (appendix figure A3). This allows us to compare supply and demand sides over time. Comparing the proportion of people who work as managers, professionals and technicians (ISCO 1-3) and the total number of workers, we discovered the proportion of individuals who work in professions that require at least the completion of tertiary education according to the International Labour Office. It is noted that the percentage of highly skilled non-manual jobs declined in Greece from 34.5% in 2010 to 29.9% in 2015 (secondary vertical axis). During the same period the proportion of tertiary graduates in the working population between 25-64 years old from 22.8% to 32.7% (primary vertical axis). Applying the same approach to our sample, the gap between positions in skilled levels 3 to 4 that require higher education and the corresponding graduates increased (appendix table A12). Only in 2011 did the vacancies in these professions exceed the numbers of university graduates. Then there is the overabundance of highly educated people in relation to these jobs. The mismatch peaks in 2016 but is steadily present until the end of the crisis. If we take into account the large number of graduates who immigrated in the first years of the crisis, we can assume that the problem is even bigger for

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the Greek economy, which does not create highly skilled jobs. We can also check the unmatching between occupations' requirements and workers' backgrounds in all levels of professions and education. With regard to Level 2 skilled occupations, we can see that they constitute the majority of jobs in Greece with a proportion of more than 60%. The lower percentage of adequately educated workers leads to the assumption that these professions absorb workers with higher or lower qualifications creating the incidence of overeducation and sometimes of undereducated workers as well. Finally, the low demand for skilled workers at level 1 is covered by the higher percentage of those completing primary education.

Overeducation rates vary across EU countries, with the highest incidence observed in peripheral nations (McGuinness, Bergin and Whelan, 2018). The contextual core characteristics of tertiary education in Greece can help us to interpret partly the results. The university sector includes high education institutions (AEIs) and Technical Universities (TEIs) which provide ISCED 6 and 7 level degrees. They have been equated to the previous decade and the minimum registration period is four years. Compared to other EU countries, Greek students present the highest proportion in the total population, women outnumbering men while they choose more social sciences and other humanities and less engineering and other studies oriented to manufacturing. This means that the vast majority of graduates have not acquired specific knowledge about a discipline but general skills, which creates problems in landing an adequate job (European Commission, 2020).

Overeducation has regained importance given that there are few studies on occupational choices in Greece, and the characteristics of the overeducated are even less investigated. We address a specific logit regression for those who were overqualified in a specific year and those who are correctly allocated workers (undereducated workers excluded) in our sample. We also check workers who are overqualified for four consecutive years by calling them long-term overqualified workers. We run the regression for pool data across this period (table 4). Starting with the job-related variables, employees are more exposed to overeducation. The self-employed and family workers are more likely to be correctly matched by having the opportunity to choose a position suitable to their educational background. Overeducated workers have less experience and tenure than adequately educated workers. That means overeducation may be part of a career mobility process. The overeducated may be temporarily employed in jobs that require fewer skills to gain the experience and training necessary to advance career mobility in their future working lives. Women face lower risks of being overeducated than men in the short and long term. It is interesting due to the fact that they are more educated in Greece and it is assumed that they would be vulnerable to employment mismatching. As a consequence, this evidence shows the ability of women to better identify the correct job. The results also indicate that young people do not have significantly different probabilities of temporary overeducation. However, it is possible to experience long-term traps in times of recession. Married workers have responded affirmatively to over-skilled positions. As previous literature has

shown, family commitments, less time to search for another job as well as less geographical movement flexibility can explain why the overeducated were more represented in both regressions.

Three dummy variables for the highest educational level attained by individuals (secondary, bachelor and master) were created. With so many graduates of tertiary education, it is essential to be report potential differences in tertiary level between those who completed a bachelor degree and those who have a higher qualification. In both types of tertiary degrees, our empirical estimates unveil a positive and significant association between this level of attainment and overeducation. Nevertheless, postgraduate degree holders have lower possibilities of ending up overqualified for their job position. All previous findings remain significant, even in controlling the degree of urbanization. Living in cities offers better opportunities for correct job matching in Greece. Greece has only two major cities (Athens and Thessaloniki) in which 60% of the population lives. Finally, we reported here a function of parental background as potential factor needed for a successful search and help for finding a more suitable position. We conjectured that family networks through social contacts, experience and level of education can help a descendant to make better choices when entering in labour market. The higher educational attainment of parents reflects fewer opportunities for the child to be overeducated, but applies to one of the four regressions. Higher occupational skill level of parents has a negative association with being overeducated, but it is not statistically significant, except the case in which they belonged in the highest level and their children avoid long-term overeducation.

Contrary to the general European trend (McGuinness, Bergin and Whelan, 2018) where female overeducation rates tend to be higher than those of male, our findings indicate that females in Greece are less likely to occupy positions requiring lower skills than their qualifications. Individuals with higher levels of education are more susceptible to overeducation, particularly when the job market does not demand their specific qualifications. Our results align with previous research concerning the determinants of overeducation, which include factors such as age and experience.

TABLE 4

Logit regressions of overeducated workers

	Overeducated		Long-term overeducated	
Young <35	0.242	0.186	**0.370****	**0.343***
	(0.159)	(0.179)	(0.177)	(0.199)
Female	**-0.293*****	**-0.340*****	**-0.269****	**-0.330****
	(0.102)	(0.118)	(0.116)	(0.135)
Marital	**0.337*****	**0.285****	**0.364****	**0.323****
	(0.130)	(0.144)	(0.146)	(0.160)
Secondary	-0.450***	-0.294	-0.606***	-0.407***
	(0.170)	(0.205)	(0.198)	(0.242)
Bachelor	**2.259*****	**2.548*****	**2.403*****	**2.688*****
	(0.175)	(0.215)	(0.201)	(0.251)
Master	**1.278*****	**1.580*****	**1.175*****	**1.395*****
	(0.232)	(0.272)	(0.271)	(0.325)
In education	0.422	0.174	0.505	0.169
	(0.281)	(0.322)	(0.323)	(0.369)
Experience	**-0.018****	**-0.021****	**-0.018****	**-0.018***
	(0.007)	(0.008)	(0.008)	(0.009)
Employees	**0.581*****	**0.680*****	**0.454*****	**0.535*****
	(0.105)	(0.124)	(0.117)	(0.139)
Age began the first job	**-0.027***	**-0.046****	**-0.046****	**-0.585*****
	(0.014)	(0.018)	(0.177)	(0.022)
Parental education (reference: primary)				
Secondary	**-0.321****	**-0.284****	**-0.461*****	**-0.351****
	(0.125)	(0.140)	(0.140)	(0.156)
Tertiary	**-0.339***	**-0.338**	**-0.273**	**-0.221**
	(0.197)	(0.222)	(0.211)	(0.242)
Parental occupational (reference: skill level 1)				
Skill level 2	-0.093	-0.355	-0.044	**-0.334***
	(0.127)	(0.173)	(0.143)	(0.198)
Skill level 3	0.191	0.085	0.115	-0.015
	(0.260)	(0.349)	(0.276)	(0.381)
Skill level 4	-0.252	-0.451	**-0.577****	**-0.923*****
	(0.257)	(0.297)	(0.288)	(0.344)
Living in cities		**-0.292****		**-0.335****
		(0.126)		(0.142)
_cons	-2.27508	-1.126503	-2.36122	-1.190575
Obs.	3,055	2,304	2,835	2,122

The symbols *, ** and *** denote statistical significance at 10%, 5% and 1%.

Robust standard errors in parentheses.

Source: Analysis of cross-sectional and longitudinal microdata from the EU-SILC survey (authors' calculations).

8 DISCUSSION

Our motivation in this paper has been to explore the intragenerational occupational mobility over the past decade and to contribute to a better understanding of the consequences of the crisis. The memorandums intensify the segmentation of the previous situation on the labour market and in the public sector facilitating the incidence of severance leading to occupational changes and decisions for many Greeks. Our results showed that downward mobility was the common trend in intra-generational occupational mobility during the first period of the crisis. Significant changes occurred between 2011-2015. The recovery is apparent after 2015 translating as higher upward occupational and employment movements but with a polarization of middle paid professions. Our analysis also showed that this trend is similar independently the classification of occupations. No significant mobility differences were noticed among occupational, employment and paid-jobs mobility.

Subsequently, we explore who has been affected and what characteristics have determined mobility and immobility. Tertiary education did not protect against downward mobility during the first period of the decade as tertiary graduates had more possibilities to go downward and fewer possibilities to go upward. More educated workers had greater mobility than adequately educated workers in similar jobs during 2011-2015 but this mainly had negative effects. Overeducation and undereducation are associated strongly with the possibilities of mobility during the decade of 2010. Overqualification mainly protected against downward movements, while underqualification offered more opportunities for downgrading, although their disadvantage had a downward effect. During most of the survey periods, women were also less likely than men to be more mobile since the onset of the crisis. Young people under the age of 30 are the least mobile within occupational skill levels across all the age groups studied. Incidence of overeducation, the factors influencing it and the characteristics of overeducated people were the next issues which we explored. Overeducation in Greece was a sum of increasing tertiary graduates, demolition of high-skilled job positions and creation of more positions requiring lower skills. Consistent with the previous findings even those with a master's degree may be overeducated in the long run. Contrary to previous career mobility literature, overqualified employees are not mainly females while workers in education don't lead to better jobs. We are also addressing whether human capital accumulation or family background are the drivers of this situation. The policy implications of these findings are that it is necessary for the state to intervene to provide educational knowledge and skills transferable in the labour market and not just qualifications through the free entry into tertiary faculties. It is crucial that modern higher education offer skills that are transferable and adaptable in different fields and offer flexibility to graduates to move to another job and not create barriers. The skills acquired from formal education also need to contribute to entrepreneurship. The Greek state can control the unmatching of qualification and job requirements in public sector but it is difficult to solve the problem of overeducation in the private sector which is self-regulating. The rising stock of educated young people who migrate abroad for a better professional future, the

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reducing rate of returns to education may signal the need for extra measures in tertiary education. An introduction of minimum tuition fees in public universities (with a British model of funding) and limits on the years of studies (plus a limit on how many times you can be re-examined in a module) will help to increase the quality of teaching, studies and research (by saving money that is being spent without reason) and discourage people who study for irrelevant reasons (being hired for any public position, delay in military service, studies to apply for various permits, acquisition of professional rights for self-insurance).

Social equity entails better functioning of the labour market, new skills training for unemployed people, especially among the vulnerable groups identified by the analysis and aid for correct matching between them and emerging job positions. This paper suggests further research directions. A first step could involve an econometric analysis of reforms implemented. It should assess the comprehensiveness of these reforms and their effectiveness in mitigating the social impact on the Greek labour force. Such an analysis would inform the development of long-term, coherent, and well-designed mobility policies. Furthermore, it would be interesting to examine the diminishing returns of overeducation, the workers who were affected by the crisis with job exits and long-term unemployment and the positive labour market movements when the country started recovering after 2015.

Disclosure statement
Authors have no conflict of interest to declare.

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APPENDIX

TABLE A1

Mapping of the three job quality tiers based on average annual salaries

ISCO-08	Job quality tiers	Mean annual wages in 2011 (in thousand €)
2 Professionals	High-paid jobs (ISCO 1-2) Upper-middle income	19.4
1 Managers		18.5
3 Technicians and associate professionals	Mid-low paid jobs (ISCO 3-4-5-7-8) Middle income	16.3
8 Plant and machine operators and assemblers		14.6
4 Clerical support workers		14.0
7 Craft and related trades workers		11.6
5 Services and sales workers		11.2
6 Skilled agricultural, forestry and fishery workers	Low-paid jobs (ISCO 6-9) Lower middle income	8.9
9 Elementary occupations		8.3

Source: Analysis of cross-sectional and longitudinal microdata from the EU-SILC survey (authors' calculations).

TABLE A2

Structure of i x j design matrices[6]

Year t	Status/Skill level in year t+1				
	Unemployed	Level 1	Level 2	Level 3	Level 4
Unemployed	i1j1	i1j2	i1j3	i1j4	i1j5
Level 1	i2j1	i2j2	i2j3	i2j4	i2j5
Level 2	i3j1	i3j2	i3j3	i3j4	i3j5
Level 3	i4j1	i4j2	i4j3	i4j4	i4j5
Level 4	i5j1	i5j2	i5j3	i5j4	i5j5

Source: Pohlig (2021).

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[6] These matrices are presented as outflow tables with columns representing destination statuses and rows representing origin statuses. The immobility design matrix includes a parameter for the diagonal, indicating occupational immobility or stability. The upgrading (U) and downgrading (D) matrices each have one parameter for cells above the diagonal (upward mobility) and below the diagonal (downward mobility), respectively. Here, *ikjl* represents the transition probability from state *k* at time *t* to state *l* at time t+1.

TABLE A3

Absolute mobility indices of occupational skill levels (in %)

Skill levels	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19
Upward	6.4	6.4	5.7	5.0	4.3	7.0	5.1	6.0
Downward	10.1	7.9	8.4	5.3	4.0	4.9	4.2	4.8
Immobility	83.4	85.7	85.8	89.6	91.7	88.0	90.7	89.2

Source: Analysis of cross-sectional and longitudinal microdata from the EU-SILC survey (authors' calculations).

TABLE A4

Absolute mobility indices of job-paid levels (in %)

Wage levels	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19
Upward	5.1	4.5	4.4	3.8	3.8	6.4	4.4	4.9
Downward	8.2	6.9	7.0	4.6	3.4	3.9	3.7	4.1
Immobility	86.6	88.6	88.6	91.5	92.8	89.8	91.9	91.0

Source: Analysis of cross-sectional and longitudinal microdata from the EU-SILC survey (authors' calculations).

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TABLE A5
Absolute mobility indices of employment levels (in %)

	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19
Upward	–	–	–	9.1	9.5	9.1	9.2	7.8	11.2	8.6	10.7
Downward	–	–	–	11.0	10.1	10.5	6.1	4.9	6.0	5.7	5.9
Unemployed in our sample	–	–	–	17.9	20.5	23.1	24.3	20.3	18.6	15.9	13.8
Immobility	–	–	–	61.9	59.9	57.2	60.4	66.9	64.2	69.8	69.6
Official unemployment rate	9.5	12.7	17.8	24.3	27.3	26.4	24.9	23.5	21.4	19.3	17.3

Source: Analysis of cross-sectional and longitudinal microdata from the EU-SILC survey (authors' calculations).

TABLE A6

Employment mobility between 2011-2012 (in %)

			Year 2012					
		Unemployed	Skill level				Total
			1	2	3	4	
	Unemployed	77.19	4.56	16.32	0.88	1.05	100
	1	8.75	63.33	27.08	0.83	0	100
Year 2011 Skill level	2	4.48	3.39	86.88	4.65	0.60	100
	3	4.49	1.43	33.27	55.10	5.71	100
	4	2.35	0	6.10	5.16	86.38	100

Source: Analysis of cross-sectional and longitudinal microdata from the EU-SILC survey (authors' calculations).

TABLE A7

Employment mobility between 2012-2013 (in %)

			Year 2013					
		Unemployed	Skill level				Total
			1	2	3	4	
	Unemployed	79.71	3.01	14.10	1.11	2.06	100
	1	10.08	74.03	15.50	0.39	0	100
Year 2012 Skill level	2	5.38	2.48	86.08	4.75	1.32	100
	3	2.89	1.05	33.07	55.91	7.09	100
	4	3.38	0	3.60	3.83	89.19	100

Source: Analysis of cross-sectional and longitudinal microdata from the EU-SILC survey (authors' calculations).

TABLE A8

Employment mobility between 2013-2014 (in %)

			Year 2014					
		Unemployed	Skill level				Total
			1	2	3	4	
	Unemployed	79.33	4.18	13.24	1.32	1.93	100
	1	11.34	75.26	12.37	0.69	0.34	100
Year 2013 Skill level	2	6.12	3.58	86.34	3.08	0.87	100
	3	3.60	0.45	29.66	58.43	7.87	100
	4	4.34	0.14	3.93	6.78	84.80	100

Source: Analysis of cross-sectional and longitudinal microdata from the EU-SILC survey (authors' calculations).

TABLE A9

Employment mobility between 2014-2015 (in %)

			Year 2015					
		Unemployed	Skill level				Total
			1	2	3	4	
	Unemployed	79.65	3.09	12.93	1.91	2.42	100
	1	8.75	78.51	11.41	0.27	1.06	100
Year 2014 Skill level	2	4.04	2.29	90.48	2.09	1.10	100
	3	2.79	0.37	14.71	70.95	11.17	100
	4	1.07	0	2.15	4.83	91.95	100

Source: Analysis of cross-sectional and longitudinal microdata from the EU-SILC survey (authors' calculations).

TABLE A10
*The distribution of occupations ISCO (in %)*

Occupational categories	2011b	2012	2012b	2013	2013b	2014	2014b	2015	2015b	2016	2016b	2017	2017b	2018	2018b	2019
Managers	8.3	5.9	5.5	3.2	3.4	2.1	1.8	1.5	1.6	1.6	1.9	3.5	4.0	4.2	4.6	4.6
Professionals	13.4	13.1	14.2	14.5	17.6	17.3	18.1	18.8	17.7	17.5	15.9	16.7	17.0	16.8	16.2	16.5
Technicians	6.4	5.8	5.8	6.9	8.0	8.3	8.5	8.3	8.5	8.1	6.8	6.1	5.6	6.0	5.8	6.1
Clerks	10.5	11.6	12.7	11.6	12.3	11.3	11.7	11.5	10.6	10.4	11.5	11.8	11.5	11.3	11.0	10.7
Service workers	16.9	19.2	19.5	22.1	21.5	23.0	23.0	22.9	24.1	25.2	26.5	24.4	23.5	23.8	22.7	22.4
Skilled workers	15.4	15.2	13.5	13.4	10.4	10.1	10.1	10.4	11.3	11.6	12.0	12.0	12.8	12.7	13.8	13.8
Craft workers	14.8	14.0	13.9	13.4	12.9	12.6	12.0	11.1	10.4	10.3	10.0	10.0	10.5	10.7	11.1	11.3
Plant operators, etc.	6.7	6.3	6.6	6.0	5.6	5.7	5.8	5.7	5.8	6.2	6.2	6.6	6.5	6.5	6.1	6.3
Elementary occupations	8.3	8.9	8.2	8.9	8.2	9.5	9.0	9.8	10.0	9.1	9.1	8.9	8.6	7.9	8.8	8.3
Obs.	3,501	3,501	3,511	3,511	4,614	4,614	5,912	5,912	9,894	9,894	13,967	13,967	14,901	14,901	11,395	11,395

Note: b represents the distribution of professions at the end of each year.

Source: Analysis of cross-sectional and longitudinal microdata from the EU-SILC survey (authors' calculations).

FIGURE A1
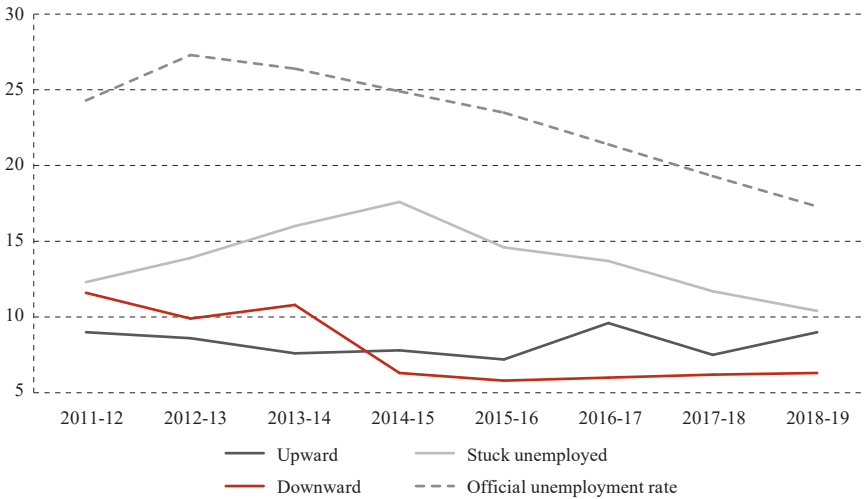
Absolute occupational indices for people between 30-60 years old (in %)
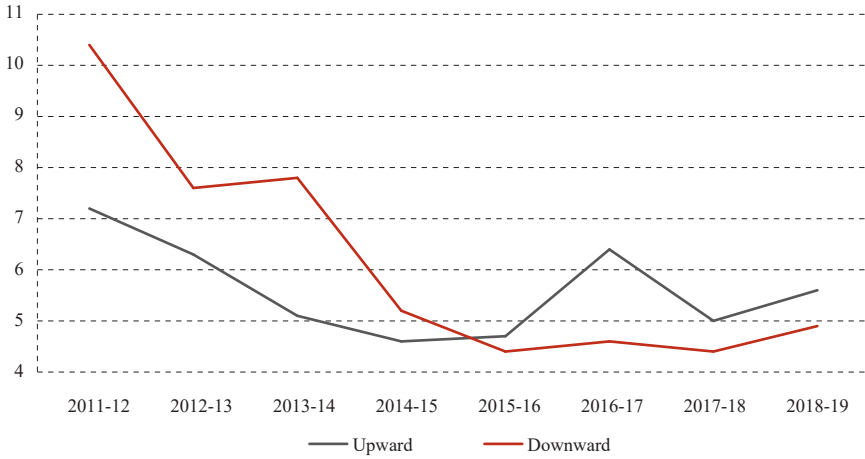
Source: Analysis of cross-sectional and longitudinal microdata from the EU-SILC survey (authors' calculations).

FIGURE A2

Absolute employment indices for people between 30-60 years old (in %)

Source: Analysis of cross-sectional and longitudinal microdata from the EU-SILC survey (authors' calculations).

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TABLE A11

Multinomial logistic regressions results on the middle skill levels

|	Remaining in the same level							
	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19
Marital	0.010	**-0.022**	**-0.022**	0.002	0.010	-0.001	0.005	0.008
Female	0.009	0.009	0.010	-0.007	0.000	**-0.016**	**-0.007**	**-0.027**
Tertiary	-0.200	-0.150	-0.169	-0.109	-0.050	-0.105	-0.062	-0.121
Underqualified	-0.220	-0.189	-0.152	-0.098	-0.041	-0.072	-0.056	-0.048
Qualified(ref)								
Overqualified	**0.032**	0.008	**0.059**	**0.038**	**0.032**	**0.043**	0.009	**0.049**
Years of experience	**0.003**	**0.001**	**0.001**	**0.001**	**0.002**	0.001	**0.001**	**0.001**
Current education	**0.105**	-0.017	0.019	0.017	0.024	-0.013	-0.002	**-0.032**
Young (17-30)	**0.053**	-0.011	0.020	**0.025**	**0.016**	0.004	0.008	0.011
Middle (31-50) ref.								
Old (50-67)	0.007	0.009	0.016	0.008	**-0.017**	0.002	**-0.012**	-0.007
	From upper skilled level to middling or lower							
Marital	-0.005	0.002	**0.020**	-0.005	-0.005	-0.001	0.000	**-0.007**
Female	-0.009	-0.005	**-0.017**	0.000	0.002	0.001	-0.003	**0.014**
Tertiary	0.145	0.097	0.108	0.045	0.033	0.048	0.036	0.056
Underqualified	**0.247**	**0.225**	**0.190**	**0.102**	0.057	0.096	0.077	0.078
Qualified(ref)								
Overqualified	-0.043	-0.048	-0.052	-0.039	-0.033	-0.036	-0.023	-0.032
Years of experience	-0.003	-0.001	-0.001	-0.002	-0.001	-0.001	-0.001	-0.001
Current education	-0.073	-0.021	-0.035	-0.022	-0.025	-0.015	-0.021	0.008
Young (17-30)	**-0.036**	0.010	-0.005	-0.011	**-0.010**	0.001	-0.004	**-0.008**
Middle (31-50) ref.								
Old (50-67)	-0.003	-0.011	**-0.021**	-0.002	0.009	0.007	0.003	0.006
	From lower skilled level to upper							
Marital	-0.005	**0.021**	0.002	0.003	-0.005	0.002	-0.005	-0.001
Female	-0.001	-0.003	0.008	0.007	-0.001	**0.015**	**0.010**	0.013
Tertiary	0.055	0.053	0.062	0.065	0.017	0.057	0.026	0.065
Underqualified	**-0.027**	**-0.035**	**-0.038**	-0.004	**-0.016**	**-0.024**	**-0.021**	-0.030
Qualified(ref)								
Overqualified	0.011	**0.040**	-0.007	0.001	0.001	-0.007	**0.014**	**-0.018**
Years of experience	0.000	0.000	0.000	0.000	0.000	**0.001**	0.000	0.000
Current education	-0.032	**0.038**	0.016	0.005	0.001	**0.028**	**0.022**	**0.024**
Young (17-30)	**-0.017**	0.001	**-0.015**	**-0.014**	**-0.006**	-0.004	-0.004	-0.003
Middle (31-50) ref.								
Old (50-67)	-0.004	0.002	0.005	-0.005	0.008	-0.008	**0.008**	0.001

Notes: Bold coefficients are significant at the 10 percent level or better.

Dependent variable: mobility between skilled levels.

Source: Analysis of cross-sectional and longitudinal microdata from the EU-SILC survey (authors' calculations).

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FIGURE A3

The evolution of high-skilled occupations and tertiary graduates during 2008-2020 for people between 25-64 years old (in %)
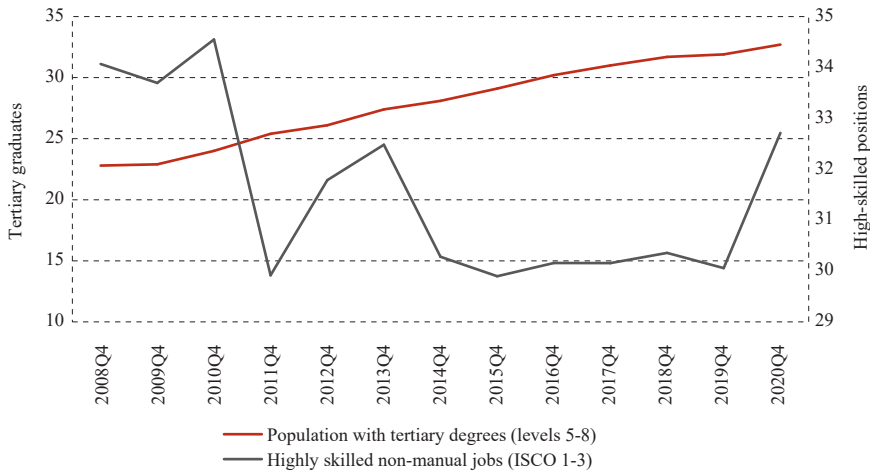
Source: Eurostat.

TABLE A12

The percentages of each skill level of occupation and the proportion of graduates from each educational level

	2011	2012	2013	2014	2015	2016	2017	2018	2019
Skill level 1	8.1	8.2	8.8	9.9	10.4	9.3	8.9	8.4	8.4
Primary	19.3	18.3	14.8	14.1	13.8	13.7	13.8	13.1	14.6
Mismatch in low level	-11.2	-10.1	-6.0	-4.2	-3.4	-4.4	-4.9	-4.8	-6.3
Skill level 2	62.6	66.4	63.3	63.1	62.8	65.7	64.4	63.6	64.1
Secondary-Post Secondary	53.8	54.5	54.2	54.0	53.9	54.3	54.9	55.4	54.5
Mismatch in medium level	8.8	11.9	9.1	9.1	8.9	11.4	9.4	8.2	9.7
$3^{rd} - 4^{th}$ level	29.2	25.3	27.8	26.9	26.8	25.0	26.7	28.0	27.5
Tertiary	26.8	27.0	31.0	31.4	31.5	31.3	30.5	30.4	29.9
Overeducation in high level	2.4	-1.7	-3.2	-4.4	-4.8	-6.3	-3.7	-2.3	-2.4

Source: Analysis of cross-sectional and longitudinal microdata from the EU-SILC survey (authors' calculations).