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Overeducation Among Saudi Graduates in the Labour Market: Incidence and Determinants Across Two Self-Assessment Measures

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Abstract

Education expansion has prompted an extensive body of literature on the issue of overeducation, particularly in developed countries. However, as is the case for many developing countries, little, if any, empirical evidence from Saudi Arabia has emerged on this topic. Using cross-sectional survey data, this study examined the prevalence and possible determinants of overeducation among Saudi graduates in the labour market on the basis of two different self-assessment measures. Results indicated that nearly 50% of Saudi graduates in the study were considered overeducated based on each measure, while about 41% were consistently considered overeducated based on both measures. Using logistic regression models, several individual and job characteristics were deemed as major determinants of the probability of being overeducated across both measures. Furthermore, the two measures largely overlapped and yielded somewhat similar conclusions in terms of both the estimates and determinants of overeducation among graduates. The plausible implications of the results for education and labour market policies are discussed.

Keywords: Education–Job Mismatch, Overeducation, Graduates, Labour Market, Saudi Arabia, Worker Self-Assessment

1. Introduction

The increasing investment in education over the last decades has led to a sharp increase in the supply of highly qualified labour in most countries (Verhaest & Omeij, 2010). There is wide consensus that education plays a vital role in yielding various economic, social, and cultural rewards for individuals, firms, and society (Barro, 2001; Psacharopoulos, 1994). However, recent expansion in higher education has sparked a growing debate on the returns of surplus education and the ability of labour markets to provide individuals with compatible jobs (Capsada-Munsech, 2019; Quintini, 2011). Scholars argue that the increased education attainment by itself is insufficient to bring about desired outcomes, as is idealistically assumed. Rather, the returns on societal and

educational investment depend largely on whether those educated persons are employed in jobs that match their attained education (Dolton & Vignoles, 2000; McGuinness, 2006). Overeducation is a type of education–job mismatch and typically refers to the situation in which the worker has a higher education level than normally required or needed for their job (McGuinness, 2006).

A substantial amount of research, particularly in western developed countries, has analysed this issue and its relevance to the labour market. Evidence shows that overeducation is consistently prevalent in both developed and developing countries (Dolton & Vignoles, 2000; Groot & Maassen van den Brink, 2000; Hartog, 2000; McGuinness et al., 2018). In addition, economic and sociological literature suggests that overeducation is a source of inefficiency within the labour market and can result in serious socio-economic costs at micro and macro levels (Congregado et al., 2016; Hartog, 2000; Turmo-Garuz et al., 2019; Velasco, 2000). Overeducation has thus become a crucial problem in many countries, raising concerns that the rapid expansionary education policies may not always bring their desired outcomes (Budría & Moro-Egido, 2008).

As many developing countries, Saudi Arabia has witnessed a significant increase in education enrolments since the early 2000s. Consequently, the number of Saudi graduates seeking jobs has tremendously increased in the past decades. For example, the number of students enrolled in tertiary education increased from around 40,000 in 2000 to over 1.62 million in 2018,¹ resulting in an increase in Saudi graduates from approximately 55,000 to 256,000 (Ministry of Education, 2020).² Based on the last Education and Training Survey conducted in 2017, the total Saudi enrolment in tertiary education—as a share of Saudi tertiary-age population (18–22-year-olds)—was 69% (General Authority for Statistics [GAS], 2017). The percentage of Saudi adults (25–64-year-olds) with a bachelor's or equivalent (23.4%) is of the highest among OECD countries (ranked 10 out of 46; Organisation for Economic Co-operation and Development [OECD], 2020).

Despite the increasing supply of Saudi graduates in the last two decades, the relative demand in the labour market has remained low. This is reflected by the unemployment rate for Saudis, which has been relatively high—above 10%—for nearly a decade (i.e., around 12% over the last five years; GAS, 2019). Saudi employment rate for tertiary-educated adults is of the lowest among OECD countries; only 74% of tertiary-educated adults are employed (ranked 43 out of 44; OECD, 2020). There is, therefore, a concern that the significant increase in the supply of graduates may have led to a further increase in the share of those forced to take jobs for which they are overeducated since they could not secure a suitable job.

Some reports about the Saudi labour market have revealed that having a university degree does not actually ensure employment in a job that requires one's level of education (Center for Statistical Research [CSR], 2010; Evidence for Policy Design [EPoD], 2015; Ministry of Labor and Social Development [MLSD], 2016). Habibi (2015) analysed the trends in the supply and demand for university graduates in the Saudi labour market. He argued that the rapid increase in Saudi graduates is likely to exceed the employment opportunities that can be created in the coming years, forcing those surplus graduates to either accept jobs below their education level or join the unemployed.³ Despite such enduring poor job market prospects for graduates, both the demand for and access to university education remains high. In the ongoing national economic and social changes and reforms in Saudi Arabia, guided by its Vision 2030 agenda that aims at creating a sustainable knowledge-based economy, it is vital to pay attention to the potential problem of overeducation among Saudi graduates, which may have resulted from the rising gap between the supply and demand for these graduates in the labour market. To the author's best knowledge, no study has directly analysed the dynamics of overeducation in Saudi Arabia.

¹ This is largely due to the sharp increase in the number of universities: from only nine public universities in 2000 to 43 public and private universities in 2017.

² These figures include students and graduates at the level of diploma, bachelor, and postgraduate studies from the local higher education institutions; those Saudis studying abroad, whose number has increased from 10,260 in 2000 to 122,530 in 2018, are not included.

³ Based on projections about the supply and demand for university graduates 2015–2022, Habibi (2015) suggested that the graduate surplus is likely to exceed 100,000 by 2022.

The aim of this study was to examine the issue of overeducation among Saudi graduates in the labour market. Using two self-report measures, it documented the incidence and potential determinants of overeducation in the rarely studied context of developing countries. Given its continuous massive investment in education on the one hand (e.g., 19% of the state budget in 2020; Ministry of Finance, 2020), and the relatively lower levels of returns to such an investment on the other, Saudi Arabia—a high-income developing country—might be a unique context in which to examine the issue of overeducation.

2. Literature Review

2.1 Definition and Measurement of Overeducation

Overeducation is broadly defined as the extent to which one has an education level in surplus of that which is typically required for a particular job (Badillo-Amador et al., 2005; Capsada-Munsech, 2015; Salinas-Jiménez et al., 2016).⁴ Nonetheless, overeducation is a relative phenomenon; a person who is overeducated for a particular job might not be so defined for another (Farooq & Ahmed, 2007). The specific definition of overeducation depends on how it is measured within the given data. Thus, the operationalisation of overeducation entails a measure for both the acquired and required levels of education (Linsley, 2005; Verhaest & Omey, 2010). Acquired level of education is typically measured as the number of completed years of schooling or as the highest level of attained education. To measure the level of education required by a given job, researchers have commonly used three main approaches, each of which implies a different definition of overeducation: job analysis (JA), realised match (RM), and worker self-assessment (SA; Badillo-Amador et al., 2005; Hartog, 2000; McGuinness, 2006).⁵ Although these measures are intended to assess the same concept of overeducation, the incidence estimates vary largely based on the measure applied (McGuinness et al., 2018).

Each of the above methods is vulnerable to biases and measurement errors (McGuinness, 2006). Indeed, in most studies, the validity and choice of a particular method depend mostly on data availability (Budría & Moro-Egido, 2018). Overall, many researchers consider the SA measure to be the best and most effective measure of overeducation available; and therefore, it has been used extensively in previous studies.⁶ SA is based on worker's self-assessment of the educational requirements of their job and can either be indirect (ISA) or direct (DSA) based on the formulated questions asked (Baert et al., 2013; Green & Zhu, 2010). More importantly, previous reviews (e.g., Groot & Maassen van den Brink, 2000; Hartog, 2000; McGuinness, 2006) revealed that the estimates, determinants, and impacts of overeducation tend to vary across the three measurement methods, even within the same labour markets. Thus, how overeducation is measured is vital when interpreting the results of overeducation research. Flisi et al. (2017) recommended that a careful combination of these methods is likely to be the best solution to obtain an understanding of the differences across measures (see also Capsada-Munsech, 2019). While most studies rely on one of these three techniques to measure overeducation, different combinations of objective (e.g., JA or RM) and subjective (e.g., ISA or DSA) methods have also been used in the literature, driven by data availability (Battu et al., 2000; Chevalier, 2003; Chevalier & Lindley, 2009; Tarvid, 2015; Verhaest & Omey, 2006a, 2006b).

2.2 Prevalence of Overeducation

Overeducation has been cited as a pervasive feature of modern labour markets. Reviews of the literature indicate that overeducation exists in various developed countries, with its incidence sometimes estimated to exceed 40%.

⁴ Overeducation is seen as a form of person–job misfit (Edward 1991), in which the overeducated individual experiences a mismatch between their qualifications and their job demands. For more discussion on the theoretical perspectives used to explain the occurrence of overeducation and its impact, see, for example, Capsada-Munsech (2017) and Luksyte and Spitzmueller (2011).

⁵ These methods are also referred to as the normative or objective method, the empirical or statistical method, and the subjective or self-reported method, respectively. Comprehensive reviews of the different measurement methods are available in the literature (see Dolton & Vignoles, 2000; Leuven & Oosterbeek, 2011; McGuinness et al., 2018).

⁶ Analyses of these different measures show that the SA measures are the least likely, when compared to the other methods, to yield biased estimates of the incidence of overeducation (Castagnetti et al., 2018; Hartog, 2000; Leuven & Oosterbeek, 2011; McGuinness, 2006).

For example, Battu et al. (2000) concatenated 36 separate estimates of the rate of overeducation in several western economies, and found that an average of one-quarter (25%) of the individuals in the labour force was overeducated across the three measures (SA, JA, and RM), with estimates ranging from 7% to as high as 67% of the workforce. In a cross-country meta-analysis of 25 research studies (Groot & Maassen van den Brink, 2000), the incidence of overeducation ranged from 10% to 42% across the different measures. The average incidence of overeducation was 22% in European countries and 26% in the United States. McGuinness (2006) analysed the incidence of overeducation reported in 33 studies in developed countries, generating more than 60 different estimates. Irrespective of the measurement method used, the incidence of overeducation in the reviewed studies ranged from 7% to 57%. Consistently, McGuinness (2006) found that the United States had the highest incidences of overeducation, whereas some European countries, particularly Holland and Germany, had the lowest. Recently, McGuinness et al. (2018) reviewed 98 studies on overeducation in 39 developed countries and found that the overall average incidence of overeducation, based on a total of 296 estimates, was 21.5% for SA, 25.5% for JA, and 25.9% for RM measure. Figure 1 shows the average incidence of overeducation in a number of developed countries based on the different measures. Other single-country studies also found overeducation to be prevalent in many developed countries.⁷

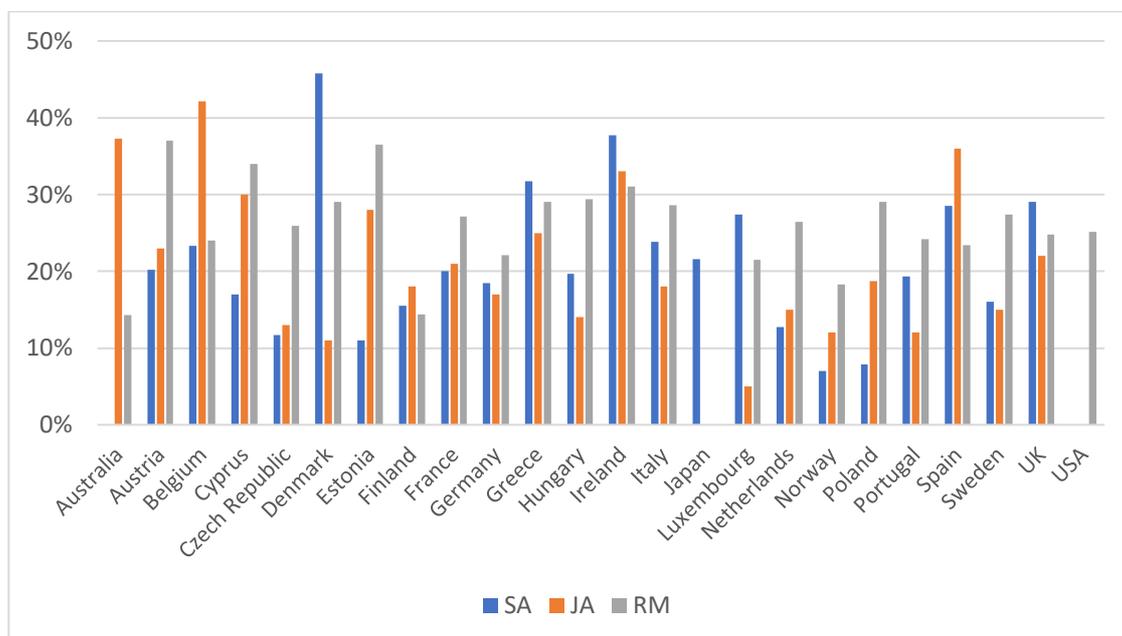


Figure 1: Average incidence of overeducation in selected developed countries

Note. SA, self-assessment; JA, job analysis; RM, realised match. Author's graphic based on estimates (2006–2016) from McGuinness et al. (2018).

Despite the extensive research on overeducation in developed countries, this topic has received much less attention in the context of non-western countries.⁸ Several studies, however, have examined the prevalence of overeducation in developing market countries over the last two decades. Figure 2 reports the incidence of overeducation in several developing countries, where results have shown that overeducation is a widespread phenomenon. For instance, Sparreboom and Staneva (2014) reported an average overeducation incidence of 16% across 28 developing countries using the JA measure, with a range from 2% in Malawi to 63% in Samoa. In contrast, Handel et al. (2016) provided additional cross-country evidence based on SA approach, in which they found the average incidence of overeducation across 11 developing countries to be around 36% (ranging from 22% in Macedonia to

⁷ These include the United Kingdom (Alpin et al., 1998; Dolton & Vignoles, 2000; Green et al., 2002), Australia (Carroll & Tani, 2013; Li & Miller, 2015; Mavromaras et al., 2010), Spain (Badillo-Amador et al., 2005; Turmo-Garuz et al., 2019), Ireland (Flisi et al., 2017), and Italy (Capsada-Munsech, 2015; Cattani et al., 2018), among others. Some studies, however, reported relatively low rates of overeducation in such European countries as Norway, Switzerland, and Finland (McGuinness et al., 2018).

⁸ A possible reason for the lack of overeducation research in developing countries may be due to the lack of data required for the measurement of overeducation in these countries compared to the developed countries (McGuinness, Bergin, & Whelan, 2018).

70% in Vietnam). Based on data from 1990 to 2011, Sam (2018) found the average rate of overeducation using the SA measure among tertiary graduates across 63 developing countries in 2011 to be around 27%. Results indicated that the rate of overeducation was 17% in Europe and Central Asia, 21% in the Middle East and North Africa, 22% in Latin America and the Caribbean, 26% in East Asia and the Pacific, and 33% in South Asia. These rates appear to be generally higher than those reported in developed counties (see Figure 3). Thus, when considering cross-country data within the same measures (e.g., SA and JA), overeducation may be more prevalent in developing (vs. developed) nations. Several single-country studies have also been conducted in developing countries, where high rates of overeducation are also detected.⁹

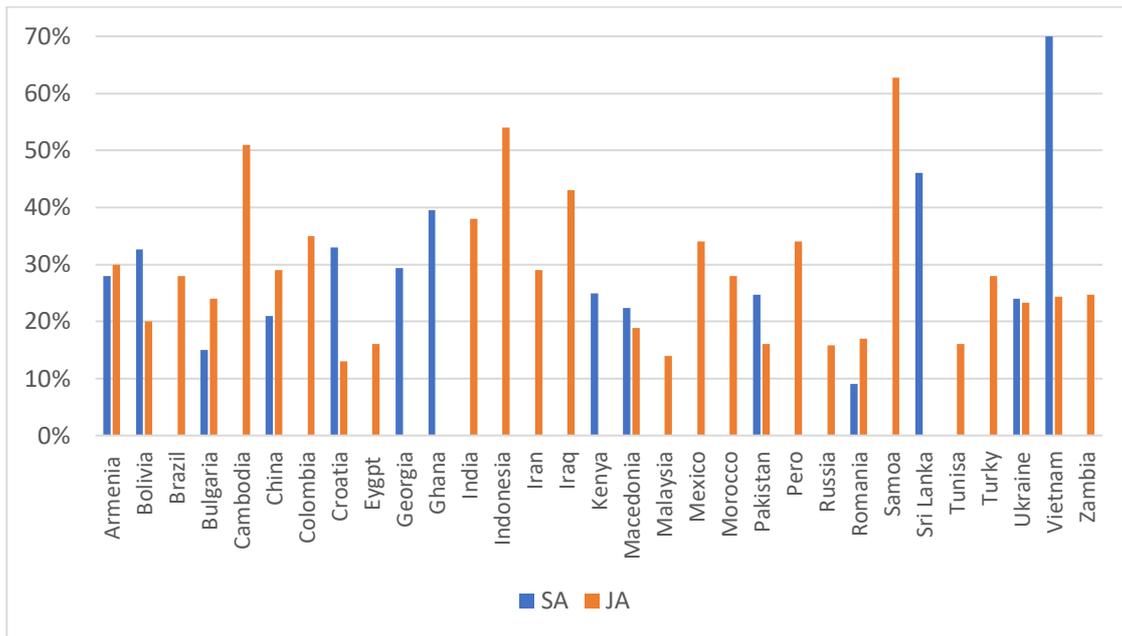


Figure 2: Incidence of overeducation in selected developing countries

Note. SA, self-assessment; JA, job analysis. Author’s graphic based on latest estimates from Handel et al. (2016), McGuinness et al. (2018), Sam (2018), and Sparreboom and Staneva (2014).

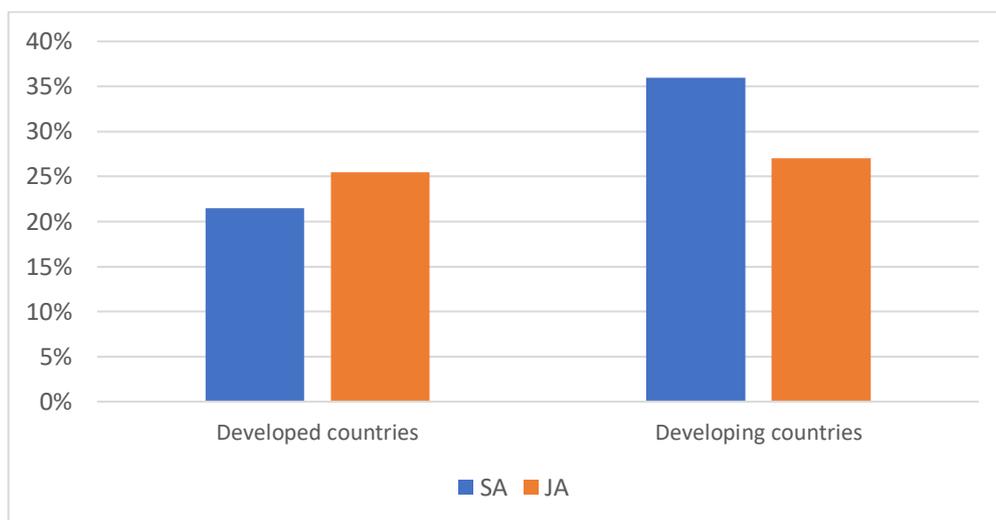


Figure 3: Average incidence of overeducation in developed and developing countries

Note. SA, self-assessment; JA, job analysis. Author’s graphic based on average estimates from Handel et al. (2016) and McGuinness et al. (2018).

⁹ These include Mexico (Quinn & Rubb, 2006), Malaysia (Lim, 2013; Zakariya, 2019; Zakariya & Battu, 2013), Pakistan (Akhtar et al., 2018; Farooq, 2011; Farooq & Ahmed, 2007), China (Yang & Mayston, 2012), and Turkey (Acar 2016; Duman 2018; Mercan et al., 2015).

Overeducation research in Arab countries is scarce. Unsurprisingly, the reported results, although indicative of relatively large proportions of overeducated individuals, are generally mixed across studies and estimation methodologies. Among the very few cross-country studies that have been conducted in the Arab world is one by Sadeq (2014), which estimated overeducation among employees in Palestine, Jordan, and Egypt using labour force surveys for 2012. He found that Palestinian workers were the most likely to be overeducated (41%), Egyptian workers were mostly undereducated (67% compared to only 15% who were overeducated), and Jordanians were the most likely to be adequately educated (41% compared to 22% who were overeducated). El-Hamidi (2009) investigated overeducation in the Egyptian private sector using the Egypt Labor Market Survey for 1998 and 2006. El-Hamidi found the incidence of overeducation to be 51% in 1998 and 42% in 2006. Habibi and El-Hamidi (2016) used data from the Egypt Labour Force Survey for 2012, and reported that 25% of Egyptian university graduates were employed in jobs that do not require a university degree; meaning one out of every four working university graduates are overeducated for their jobs. In Tunisia, the overeducation rate ranged from 19% to 27% among graduates for the period from 2009 to 2013 (Kthiri, 2019).

To date, no study has investigated the incidence of overeducation in the Saudi labour market.¹⁰ Actually, the direct objective or subjective measurement of overeducation requires micro-level data that have not been collected in Saudi Arabia.¹¹ Overeducation may indeed have different properties and implications in Saudi Arabia, where the supply of education is on the rise, unemployment is high, and the quality of education is questionable. This study aimed to contribute towards bridging this gap in the literature by investigating whether empirical studies in developed and developing economies hold true for Saudi Arabia.

Unsurprisingly, and as shown in Figures 1 and 2, the different measures of overeducation in previous studies tend to produce varying, and sometimes conflicting, estimates both across and within countries (Carroll & Tani, 2013). Taking the results of previous reviews broadly, the average estimate of the incidence of overeducation under the RM method typically tends to be the lowest, while the other two measures (JA and SA) tend to yield a reasonably higher average estimate, although their ranking is rather ambiguous (Battu et al., 2000; Groot & Maassen van den Brink, 2000; McGuinness, 2006; Cattani et al., 2018). Additionally, several authors reported sizeable differences in overeducation incidence within the single measurement approach.¹² Part of the variation in overeducation incidence can also be ascribed to the different periods analysed and groups targeted.

2.3 Determinants of Overeducation

Previous research has established several general findings concerning the determinants of overeducation, differentiating between two types of determinants: individual and job characteristics. In terms of socio-demographic characteristics, the results are generally mixed. Concerning sex, overeducation is often expected to be higher among women than men—perhaps owing to the obstacles women face concerning career advancement (Congregado et al., 2016; Frank, 1978). Nevertheless, empirical evidence is unclear. While some studies found the probability of being overeducated to be higher among women than men (Akhtar et al., 2018; Dolton & Vignoles, 1997; El-Hamidi, 2009), others found men to be at slightly more risk of overeducation than women (Alba-Ramirez, 1993; Congregado et al., 2016; Kthiri, 2019), with effects in most cases being barely significant. Additionally, some other studies observed non-significant results (Capsada-Munsech, 2015; Dolton & Silles, 2001; McGoldrick & Robst, 1996; Robst, 2008).

Some studies found that the risk of overeducation declines with age (Dekker et al., 2002; Kthiri, 2019; Vahey, 2000). Apart from the already limited jobs in the labour market, it is suggested that younger entrants, who have

¹⁰ The only exception is Alzubaidi (2020), which mainly examined the impact of overeducation among Saudi university graduates.

¹¹ Apart from the broad labour market indicators produced by the GAS in forms of periodic reports, bulletins, and figures, there seem to be no graduate or employer survey data on the Saudi labour market; nor is there a proper list compiled by job analysts that specifies the education levels (or years of schooling) required for the different jobs in Saudi Arabia.

¹² For example, estimates of the SA method vary across studies depending on the type and wording of the questions asked in the survey (e.g., overeducated vs. overskilled or DSA vs. ISA; Budría & Moro-Egido, 2018; McGuinness et al., 2018). Estimates of the RM measure may also differ based on the choice of the statistical mean or mode (Quinn & Rubb, 2006).

limited or no work experience, face greater difficulties in signalling their competence to potential employers early in their careers than do their older counterparts (Capsada-Munsech, 2017). Therefore, they may accept low-skilled jobs to avoid being unemployed. Considering the marital status, some authors suggested that married workers, especially women, are likely to experience a higher risk of overeducation relative to single workers (e.g., Frank, 1978; Robst, 2008). However, in these limited empirical studies (e.g., Battu et al., 2000; McGoldrick & Robst, 1996), the marriage effect is not evident.

Varying risks of overeducation have also been observed among individuals with different educational backgrounds. Generally, there is some evidence that the higher the education level, the higher the probability of being overeducated. The excess supply of tertiary education graduates in the labour market may have formed the incidence of overeducation among the more educated individuals, as they are likely to take jobs that are not compatible with their education (Capsada-Munsech, 2017; Congregado et al., 2016; Mason, 1996). The literature also reports a high variation in the likelihood of being overeducated across fields of study (Dolton & Vignoles, 2000; Reimer et al., 2008). Based on the average incidence of overeducation, evidence from different countries indicates that graduates of humanities, social sciences, and services are the most likely to be overeducated; while those of scientific, technical, and health fields are the least likely to be overeducated (Caroleo & Pastore, 2018; Ortiz & Kucel, 2008; Turmo-Garuz et al., 2019). This can be explained by the varying supply and demand for tertiary-educated graduates in these different fields (Capsada-Munsech, 2017).

Prior research has found several job characteristics to be relevant in identifying who are more prone to being overeducated. A few scholars suggest that previous unemployment experience (including the number and length of time an individual has been out of work) might be related to the probability of being overeducated. Individuals who have been unemployed longer or who have experienced layoffs are expected to be at higher risk of overeducation (Feldman, 1996). This might be caused by these individuals' increased likelihood of taking lower status positions for which they are overeducated to escape current unemployment (Leana & Feldman, 1995; Nielsen, 2011). However, no empirical research has directly examined the link between previous unemployment and overeducation.

Scant research has assessed the potential role of the institutional sector in determining the probability of overeducation. However, some studies have revealed overeducation risk to be higher in the public sector than in the private sector (e.g., Congregado et al., 2016; Dolton & Vignoles, 2000; Haddad & Habibi, 2017). It may be that public bureaucracies, which naturally promote inflexible hiring practices and regulate promotion processes based on seniority rather than merit, are likely to lead to a greater probability of overeducation among public (vs. private) workers (Congregado et al., 2016). Contrastingly, some comparative research suggests that, as the public sector is characterised by job security, stability, and defined career structure, the likelihood of being overeducated is lower in this sector relative to the private sector (e.g., Belfield, 2010; Budría & Moro-Egido, 2018; Velasco, 2000). However, further research is required before drawing definitive conclusions.

The risk of being overeducated varies considerably across industries. A relatively higher overeducation risk is found in industries such as agriculture, construction, transportation and manufacturing, and some services sectors. This is owing to the low quality of jobs offered by these industries, which do not typically require high qualifications. Conversely, industries such as education, health, finance, and insurance are associated with low rates of overeducation (Alpin et al., 1998; Congregado et al., 2016; Dolton & Silles, 2001). This is unsurprising since many of these traditional industries usually offer high-quality jobs that require high levels of education (Dolton & Silles, 2001).

Some studies suggested that overeducation is more prevalent among shift and part-time (vs. full-time) workers and those with fixed-term or temporary (vs. permanent) contracts (Alpin et al., 1998; Belfield, 2010; Dolton & Silles, 2001). Perhaps owing to the transitory or temporary nature of these non-standard jobs (e.g., short-term employment), workers may be less concerned about being overeducated for the job. Moreover, these jobs tend to be low-skilled occupations that require relatively low levels of education (Davia et al., 2017). However, documented evidence in the literature is extremely limited, and only a few studies have reported evidence of a possible increase in the risk of being overeducated among part-time or fixed-term workers (Belfield, 2010; Dolton

& Silles, 2001; Green & McIntosh, 2007; Zakariya, 2017). Several other job characteristics are assumed to have an important bearing on the probability of overeducation, including occupation category (e.g., managers vs. nonmanagers; professional vs. other occupations), firm size (e.g., small vs. large), and work experience (Chevalier & Lindley, 2009; Dolton & Silles, 2001; Green & McIntosh, 2007; Sicherman, 1991). However, direct evidence on the relevance of these factors is lacking.

In general, the available studies yielded sizeable differences in the probabilities of overeducation across individuals with different characteristics and profiles. While the reasons for these divergent results, or the lack of robustness, may vary across contexts, one potential explanation is the use of different measurement approaches to assess overeducation in the literature, which do not essentially yield similar results. Indeed, the few studies that attempted to identify the determinants of overeducation based on multiple measures concluded that the use of different measures is likely to produce quite varied conclusions (JA and SA; Dolton & Silles, 2001; McGoldrick & Robst, 1996; Verhaest & Omeij, 2010).

3. Methods

There were no available sources of data for direct measurement of overeducation among Saudis in the labour market. Therefore, the author conducted a cross-sectional survey over a three-week period during June 2019. For this study, an online survey was constructed using SurveyMonkey®. The survey was offered to potential respondents in both English and Arabic, depending on their preference. Details of the sampling, data collection, and measurement are provided below.

3.1 Sampling and Data Collection

The target population chosen for the current study consisted of Saudi graduates working in paid employment who held at least a secondary school degree. The survey was administrated to potential respondents who had attended one of two public universities. The participating universities— King Abdulaziz University and King Saud University—are the largest and oldest universities in Saudi Arabia, with the largest number of undergraduate and postgraduate students and graduates every year in the country. The sampling frame was obtained from the past student databases at both universities, each of which contained more than 20,000 email addresses of past students.¹³ As the databases are inaccessible to outsiders, the author worked with the responsible entity at each university to apply the sampling strategy and invite graduates to participate. Three thousand randomly identified past students from both universities were emailed an invitation by the university, requesting participation of eligible respondents, and directing them to the online survey. The email included a brief introduction to the study, the inclusion criteria for participation, and the information necessary to access the survey.¹⁴ All respondents were required to provide their informed consent prior to starting the survey. Out of those contacted, 767 eligible respondents participated; of which, 653 completed all relevant parts of the survey and composed the final sample. Table A1 (see Appendix) presents respondents' descriptive statistics. The sample was primarily male (73.2%), married (59.3%), from the province of Makkah or Riyadh (79.5.3%), and aged younger than 40 years (73.5%), with an average age of 34.9 years. The majority of respondents worked full-time (91.9%) and most held a permanent job (61.1%). Respondents held jobs in a variety of industries, and most had been employed in their current job for less than 10 years (74.3%).

3.2 Measurement

3.2.1 Overeducation

¹³ The list at each university includes all students who had taken classes at the university, regardless of whether they had completed the degree.

¹⁴ Because it was not possible to only send the survey to those past students who meet the eligibility criteria, a skip question on the opening page of the survey was included to determine the eligibility of the participants up front, in order to access and complete the survey. Only Saudi nationals who (a) are in paid employment, (b) have at least a secondary school degree, and (c) are currently residing and working in Saudi Arabia were requested to participate in the study.

Given the data availability, as well as the preference for a more refined measure of overeducation, the current study assessed overeducation using two different SA measures drawn from the survey.¹⁵ First, the ISA measure asked respondents to indicate the educational level required for new applicants to meet the hiring criteria for their current job. It was based on the following question: ‘*What minimal level of formal education is required to get your current job?*’¹⁶ Respondents were asked to select one of eight education levels: (1) ‘no specific education requirements’, (2) ‘less than secondary school degree’, (3) ‘secondary school degree’, (4) ‘diploma’, (5) ‘bachelor’s degree’, (6) ‘higher diploma or certificate’, (7) ‘master’s degree’, or (8) ‘doctorate or equivalent’. By comparing the required level of education with the attained level of education reported by the individual, respondents were classified into one of three categories: 1 = undereducated, 2 = adequately educated, or 3 = overeducated.

Second, the DSA measure asked individuals to directly indicate the level of education necessary to adequately do the job from their own perspective (McGuinness et al., 2018). It was derived from the following question: ‘*In your own experience, what level of education do you feel is most appropriate to perform your current job?*’¹⁷ Responses were: (1) ‘a higher level of education than my own would be needed’; (2) ‘my own level of education is necessary’; (3) ‘a lower level of education than my own would be sufficient’; (4) ‘for this job, no particular education is needed’. All respondents were classified into one of three categories: 1 = undereducated (selecting 1), 2 = adequately educated (selecting 2), 3 = overeducated (selecting 3 or 4).

Although both measures were based on individual self-assessment, they differed in their focus and scope. The ISA measure emphasises the formal job educational requirements (i.e., *required* level of education), whereas DSA presents individuals’ opinions of the job content (i.e., *appropriate* level of education). Furthermore, the level of education required ‘to get the job’ might differ from the level of education appropriate ‘to do the job’ (see Allen & van der Velden, 2001; Capsada-Munsech, 2015; Leuven & Oosterbeek, 2011). It is essential to keep this potential divergence in mind when interpreting the results.

3.2.2 Individual and Job Characteristics

The analyses included a set of individual and job-specific explanatory variables, most of which have been used in previous research to identify possible determinants of overeducation. These include socio-demographic characteristics (sex, age, marital status, and region), educational attainment (level of education and field of study), and employment and job characteristics (previous unemployment, sector, industry, job status, job contract, and work experience).

4. Analysis and Results

4.1 Incidence of Overeducation

Table 1 represents the incidence of overeducation for the sample based on the different SA measures. The figures converge considerably between the two measures. For the ISA measure, 47.9% of the respondents were overeducated, while 49.8% were adequately educated for their jobs. Interestingly, the situation looks very similar when looking at the DSA measure, where 50.2% of the respondents were overeducated, and 47.3 were adequately educated. Only 2.3% for ISA and 2.5% for DSA were undereducated.

¹⁵ The SA measure was indeed the only available method that allowed deriving an immediate and reliable estimate of overeducation among graduates in the Saudi labour market.

¹⁶ Similar measures, with slight differences in the formulation of the questions, were used by previous studies (e.g., Di Paolo & Mañé, 2016; Dolton & Silles, 2008; Duncan & Hoffman, 1981; Green et al., 2002; Linsley, 2005; Salinas-Jiménez et al., 2016; Verhaest & Omev, 2006a, 2006b).

¹⁷ Similar questions were used by previous studies (e.g., Allen & van der Velden, 2001; Baert et al., 2013; Budría & Moro-Egido, 2018; Capsada-Munsech, 2015; Castagnetti et al., 2018; Green & McIntosh, 2007; Verhaest & Omev, 2006a, 2006b).

Table 1: Incidence of overeducation by measurement method

Overeducation variable	Overeducated		Adequately educated		Undereducated	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
ISA	313	47.9	325	49.8	15	2.3
DSA	328	50.2	309	47.3	16	2.5

Note. $N = 653$. ISA, indirect self-assessment; DSA, direct self-assessment. Percentages are rounded up to the nearest tenth.

Table 2 reports the proportion of respondents who fall into each combination of the two measures. Although both produced comparable proportions of overeducated, adequately educated, and undereducated individuals, they did not overlap completely. Of the total number of respondents, 40.6% were overeducated on both measures, 38.7% were adequately educated using both measures, and less than 1% were undereducated on the bases of both measures. Looking at those respondents who differed on the two measures, some interesting, though small, results also emerged. For example, 9.2% were adequately educated based on ISA but were overeducated based on DSA. Namely, they had the required education level to get the job but still believed it was more education than they actually needed to adequately do their job. In contrast, 7.4% of the respondents who reported being overeducated based on the educational requirements to get the job (ISA) were adequately educated based on the educational requirements to do the job (DSA). Being overeducated on ISA while being matched on DSA might reflect surplus formal education, whereas the contrary is perhaps more indicative of surplus skills. Additionally, 0.5% of the respondents who were undereducated in terms of ISA were overeducated in terms of DSA, whereas no one was overeducated for ISA and undereducated for DSA. Finally, 1.2% of the respondents who were undereducated on ISA reported being adequately educated on DSA, while 1.8% reported the opposite. In total, 80% of the respondents were equally similar on both measures, while about 20% fell into different groups. Furthermore, the correlation between the two measures of overeducation was fairly high ($r_s = 0.66, p < .01$).¹⁸ This was expected, given the above similarities and differences between the two measures.

The correspondence and correlation between the two SA measures largely confirms that, while there is general convergence between the two, these measures focus on slightly different aspects of overeducation. Both measures are theoretically set up to identify the same concept, and they yielded relatively similar results. Yet, they are ostensibly different in terms of both construct and estimation technique. This heterogeneity may further underline the importance of comparing these two measures and examining their differences in terms of overeducation correlates.

Because of the low rates of undereducation, with the sample consisting mostly of overeducated and adequately educated individuals in terms of the ISA and DSA measures, undereducated respondents will be treated henceforth as adequately educated, composing the comparison group in the study (52.1% and 49.8%, respectively). Thus, two dichotomous variables based on the responses to the two measures are derived (0 = adequately educated, 1 = overeducated). Figure 4 shows the incidence of overeducation according to this grouping.

Table 2: Correspondence between overeducation measurement methods

ISA	DSA						Total	
	Overeducated		Adequately educated		Undereducated			
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Overeducated	265	40.6	48	7.4	0	0.0	313	47.9
Adequately educated	60	9.2	253	38.7	12	1.8	325	49.8
Undereducated	3	0.5	8	1.2	4	0.6	15	2.3
Total	328	50.2	309	47.3	16	2.5	653	100

Note. $N = 653$. ISA, indirect self-assessment; DSA, direct self-assessment. Percentages are rounded up to the nearest tenth

¹⁸ Spearman's rank-order correlation was used to calculate the correlation coefficient ($r_s = .657, p < .01$). Similar associations between the two SA measures were reported by previous research (e.g., 0.66, van der Velden & van Smoorenburg, 1997; 0.57, Verhaest & Omeij, 2010).

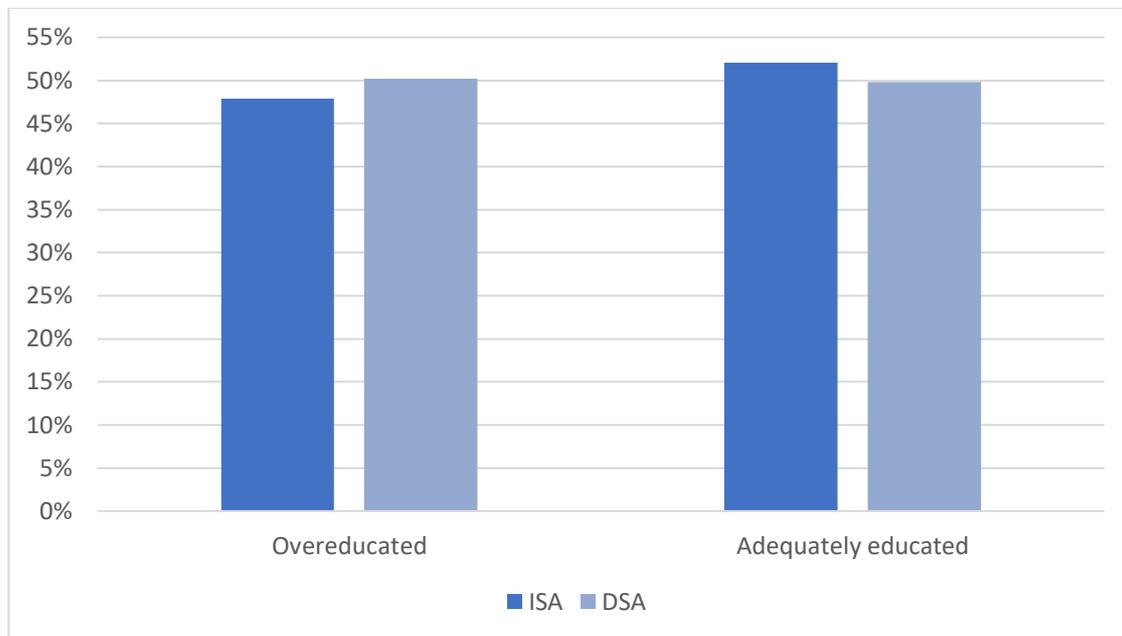


Figure 4: Incidence of overeducation by measurement method ($N = 653$)

Note. ISA, indirect self-assessment (0 = adequately educated, 1 = overeducated); DSA, direct self-assessment (0 = adequately educated, 1 = overeducated). Author's own estimates.

4.2 Determinants of Overeducation

The incidence of overeducation across individual and job characteristics is shown in the Appendix (Table A2). There were some variations in overeducation rates for measures of both ISA and DSA. To ascertain the probability of being overeducated based on these characteristics, logistic regression models were performed separately for each of the two overeducation indicators.¹⁹ In each regression model, the overeducation measure (ISA or DSA) was entered as the dependent variable, and the explanatory independent variables included the respondents' individual and job characteristics. Tables A3 and A4, in the Appendix, report the results of the logistic estimations of the probability of overeducation for each measure. In the logistic regression model for ISA, 6 variables out of 13 predictor variables were statistically significant: education level, field of study, overseas study, sector, industry, and job contract. In the logistic regression model for DSA, 5 variables were statistically significant: education level, field of study, previous unemployment, industry, and job contract.

Given the relatively higher supply of female graduates in Saudi Arabia, their lower participation in the workforce, and the fewer job opportunities available to them compared to men, it was expected that they would be more likely to be overeducated. However, this intuition was rejected, as sex was statistically non-significant for explaining the probability of being overeducated for both measures of overeducation. Furthermore, estimation results showed that age was not associated with either measure of overeducation. This finding was further supported by that for work experience, whose effect was also non-significant. Additionally, under the definition of both measures, the effect of marital status was non-significant; the results showed that being single did not increase or decrease the likelihood of being overeducated compared to individuals who were married. Furthermore, although it was expected that the risk of overeducation would be higher in the 'other regions', outside of the biggest regions of Riyadh, Makkah, and the Eastern province, because these relatively smaller regions tend to have fewer job opportunities in the different industries, the regional disparity in Saudi Arabia did not explain the probability of being overeducated. The risk of being overeducated on each of ISA and DSA was not significantly higher in any region than the omitted region of Riyadh.

¹⁹ For each model, the linearity of the continuous independent variables in terms of the logit of the dependent variable (ISA, DSA) was evaluated using the Box-Tidwell procedure (Box & Tidwell, 1962). Bonferroni's correction was conducted using all 18 terms in each model, yielding acceptable statistical significance ($p < .0028$). All continuous variables were linearly related to the logit of the dependent variable in the model. There were five cases with standardised residual values greater than ± 2.5 standard deviations, which were kept in the analysis.

The first important factor potentially explaining overeducation risk was education level. Specifically, the results showed that the higher the level of education, the higher the likelihood of being overeducated for both measures. Perhaps due to the oversupply of tertiary graduates into the labour market, individuals, particularly those with postgraduate degrees, are often forced to take jobs that do not require their education levels (either to get or to do). Moreover, respondents who studied 'science, mathematics, and computing'; 'engineering, manufacturing, and construction'; or 'health and welfare' were at lower risk of being overeducated, as defined by ISA, than those who studied 'general fields of study', which served as a baseline. Based on this measure, the probability of overeducation among those in the fields of 'education', 'social sciences, business, and law'; and 'humanities, languages, and arts' was not significantly different from those in 'general fields of study'.

Interestingly, the same results applied to the DSA measures, in which those former fields were exposed to a lower risk of overeducation than the baseline risk for being overeducated. However, the one group that did stand out on the DSA measure was 'social sciences, business, and law', which showed a significantly lower probability of overeducation on this measure as compared to 'general fields of study'. This may not be surprising, given that 'general fields of study' in the current dataset was associated mostly with those holding a secondary school degree, who, according to the previous finding, had a higher probability of being overeducated. The results generally highlight the link between field of study and labour market outcomes and can be explained by the low (and high) supply and demand for these fields.

The results based on ISA revealed that overseas-educated respondents were at a significantly higher risk of overeducation than their locally educated counterparts. This, however, was not the case for the DSA measure. Although these results are not necessarily surprising, they are not compatible with our expectations either. Given that their foreign qualifications might not be perfectly transferable to the local market, overseas-educated Saudis were expected to be more prone, than their locally educated counterparts, to being overeducated on both measures (Aleksynska & Tritah, 2013).

Unexpectedly, the effect of previous unemployment was statistically non-significant for ISA. However, the analysis showed that the risk of overeducation, as measured by DSA, increased with an increased unemployment history. This points to the importance of previous unemployment experience for current overeducation probability, particularly in terms of the educational requirement to do the job. That is, those who had been unemployed more often in the past were more likely to feel that their education was more than was needed for doing their current job. Furthermore, looking at the institutional sector, the likelihood of respondents being overeducated in 'other sectors' was higher than their counterparts in the public sector, who were the least likely to be overeducated. The effect was statistically significant only for the estimation of ISA. A plausible explanation of this finding might be that, compared to the public sector, individuals working in these sectors are expected to face a smaller number of suitable jobs and thus be more at risk of overeducation. Although the prospects for challenging or varied work in the Saudi public sector might be limited (Congregado et al., 2016), this sector may have a more defined career structure and better working conditions and promotion prospects than other sectors, resulting in employees being more likely to be well-matched in terms of the educational requirements to get the job.

An additional factor explaining the probability of being overeducated was the industry of employment (or economic activity). With 'manufacturing' set as a baseline, the probability of overeducation was significantly different across industries. Looking first at the estimate for ISA, compared to those in the manufacturing industry, respondents in 'financial and insurance activities' and 'education' were less likely to be overeducated on this measure. A higher than baseline but statistically non-significant risk of overeducation was found in other industries, such as the 'wholesale and retail trade; repair of motor vehicles and motorcycles'; 'transportation and storage'; and 'public administration and defence; compulsory social security'. For DSA, a significant higher risk of overeducation was identified in two industries: 'wholesale and retail trade; repair of motor vehicles and motorcycles' and 'transportation and storage'. Indeed, most industries showed a higher probability of overeducation on this measure than 'manufacturing'; however, these results were not statistically significant. In contrast, only those who worked in the 'education' industry were at lower risk by far, of being overeducated than those who worked in 'manufacturing'. 'Information and communication' was also associated with a lower risk of

overeducation, but statistically non-significant. The results for both measures here seem to slightly diverge, particularly in terms of those industries at a significantly higher risk of overeducation than 'manufacturing'. This provides evidence on the importance of industry as a major determinant of overeducation, regardless of the measure adopted. It seems that those low-skill, demanding industries in the private sector with low levels of required education are more likely to be affected by overeducation.

Finally, the effect of working a part-time job was statistically non-significant for all presented estimations of ISA and DSA. Hence, contrary to previous findings, working part-time (vs. full-time) does not significantly increase the risk of overeducation in the Saudi labour market. However, significant results were observed for both measures when analysing the type of job contract. Respondents who worked in a temporary or contract job had a higher risk of being overeducated compared to their colleagues with a permanent job.

Altogether, except for the variables of overseas study and sector for ISA and previous unemployment for DSA, the two SA measures yielded similar results regarding the determinants of overeducation. However, looking at the disparity in the probability of being overeducated across groups, characteristic variables such as field of study and industry showed some differences across the two measures, with some groups showing a high or low risk of overeducation on one measure but not the other.

5. Discussion

The results suggest important conclusions about the incidence and determinants of overeducation among Saudi graduates. First, among the individuals in the current sample, 48% were overeducated based on ISA, 50% were overeducated based on DSA, and 41% were consistently overeducated based on both measures. These results revealed a large proportion of overeducated graduates across the two measures, suggesting that overeducation might be a fairly widespread problem among Saudi graduates. The incidence rates of overeducation in this study were substantially high, particularly when compared to the SA estimates reported for other developed countries (e.g., Battu et al., 2000; Dolton & Vignoles, 2000; Green & McIntosh, 2007; Groot & Maassen van den Brink, 2000; Hartog, 2000; McGuinness, 2006; McGuinness et al., 2018), developing countries (e.g., Farooq, 2011; Handel et al., 2016; Quinn & Rubb, 2006), and Arab countries (e.g., Habibi & El-Hamidi, 2016; Sadeq, 2014). The results also provide further evidence that overeducation is more prevalent in less developed countries, perhaps due to the drawbacks and inefficiencies of their education systems, their job markets, or both (Görg & Strobl, 2003; McGuinness et al., 2018). Moreover, the incidence of overeducation was quite similar across the two methods of measurement, in which almost half the respondents reported being overeducated on each measure. The consistency between both SA measures is in line with prior results (e.g., Green et al., 1999; Verhaest & Omey, 2010).

Second, several individual and job characteristics were significant in explaining overeducation among Saudi graduates. In particular, consistent with previous research (e.g., Capsada-Munsech, 2017; Congregado et al., 2016; Mason, 1996), for both measures, the act of undergoing higher education was associated with a higher risk of being overeducated. Additionally, some fields of study were associated with a low overeducation risk, while others had a relatively high risk. In line with previous evidence (e.g., Caroleo & Pastore, 2018; Ortiz & Kucel, 2008; Turmo-Garuz et al., 2019), the least risk of overeducation on both SA measures was consistently found for graduates of scientific, technical, and health fields. Conversely, graduates of traditional and general fields (or less occupationally focused fields) such as social sciences and humanities tended to be at a higher risk of being overeducated, particularly in terms of the educational requirements to get a job (namely, ISA). Having studied overseas or having worked in sectors other than the public or private sectors were also found to increase the probability of overeducation under this measure. The lower probability of being overeducated in the public sector, as compared to other sectors, is similar to the pattern observed previously (e.g., Belfield, 2010; Budría & Moro-Egido, 2018; Velasco, 2000).

Furthermore, the risk of being overeducated to 'do the job', DSA, was found to increase with being unemployed more times in the past. This finding is in line with prior evidence indicating that unemployment, in terms of frequency and length, affects the likelihood of being overeducated later in one's career (Budría & Moro-Egido, 2018; Nielsen, 2011). Moreover, overeducation varied across industries. Consistent with prior results (e.g., Cattani

et al., Congregado et al., 2016;), individuals working in the industries of finance, insurance, and education were less prone to being overeducated on both measures, as compared to those working in other industries, such as trade and repair, transportation, and storage. As similarly reported by other studies (e.g., Belfield, 2010 Dolton & Silles, 2001; Green & McIntosh, 2007), the type of job contract was also important for both measures: those individuals working in temporary or fixed-contract jobs were at a higher risk of overeducation relative to those in permanent jobs, who apparently had better job-matching prospects. Contradictory to the previous findings (e.g., Belfield, 2010; Dolton & Silles, 2001; Sicherman, 1991; Vahey, 2000), age, work experience, and job status were not relevant in determining the overeducation probability for Saudi graduates based on both measures. Moreover, the effect of sex and marital status were non-significant, and previous evidence concerning both was either inconclusive or lacking altogether.

The high incidence of overeducation can be interpreted within the wider discussion of the mismatch between supply (skill market) and demand (labour market) for particular types of graduates in Saudi Arabia. The increasing influx of Saudi graduates in the past decade may have ultimately surpassed the number of suitable jobs available in the labour market. Unfortunately, this oversupply may even have caused the labour market to become saturated with graduates in those lower-demand fields, leaving a limited supply of graduates in other, higher-demand fields of study.²⁰ Some government reports (CSR, 2010; EPoD, 2015; MLSO, 2016) also point to the large gap between the skills acquired by Saudis during their education and those required by employers in the private sector. In contrast, the domestic labour market cannot create enough new jobs for the large number of Saudi graduates every year, nor can it effectively funnel new graduates into compatible jobs that match their education in the respective sectors or industries. Only limited types of education and skills directly cater to the labour market needs. Indeed, some signs suggest that job creation has been slow and largely limited to jobs at the upper and lower ends of the market, often occupied by expatriate labour; namely, the low-skilled menial jobs that Saudis graduates are mostly overeducated for, even if willing to take, and, to a far lesser extent, the highly specialised jobs that require advanced skills and extensive experience that new labour market entrants lack (Al-Asmari, 2008; CSR, 2010; Habibi, 2015). As a result, the skills market fails to produce the skills that the labour market mostly needs in terms of quality and quantity, while the latter fails to properly absorb the supply of graduates and connect Saudis to opportunities that most effectively match their education. Graduates who cannot get a suitable job in the labour market are likely to accept jobs below their qualifications (mostly low-skilled temporary) or become unemployed—a choice that is likely to increase the chances of future mismatch.

5.1 Limitations and Future Directions

This study had several potential limitations that future researchers should address. First, the sample size was relatively small; thus, the generalisability of the results to the entire population of working Saudi graduates, especially those from other universities, is limited and should be inferred with caution. Future research with sufficiently larger sample sizes is needed for more representative results. Additionally, owing to the small size of respondents initially falling into specific individual- and job-characteristic categories, some of these categorical variables were collapsed to more evenly balanced ones for statistical analyses. Thus, it was not possible to fully uncover the variations and trends related to the specific groups of these variables. The present findings may not equally generalise to all types and groups of employment, sector, and industry. Future research with larger, more distinct, and more diverse subsamples would provide even more valuable insight into overeducation risk and determinants.

Second, the use of a self-report instrument represents several limitations. Although the two measures of overeducation provided valuable insights into the patterns of overeducation based on the educational requirements to get and to do the job, both are eventually equated with one another in terms of subjectivity. Analysing overeducation using both objective and subjective operationalisations would be beneficial in shedding light on the potential differences between these indicators, their overlaps, and how each really captures overeducation (see

²⁰ Of course, the uninformed educational and career choices made by students and their parents have contributed, at least partly, to this source of inefficiency in the supply chain.

Chevalier, 2003; Verhaest & Omeij, 2010). Concerning subjectivity, individuals' assessment of the educational requirements, especially those actually needed to do their job, might have been influenced by their expectations, feelings, or preferences on and about the job, leading to measurement errors. Social desirability might also have systematically biased the data upwards or downwards.²¹ The conclusions drawn here should, at the very least, be considered in conjunction with these limitations, which have important implications for further research.

5.2 Practical Implications

The current results provide evidence suggestive of a troublesome reality, in which a large portion of Saudi graduates in the labour market might be overeducated relative to their jobs. Such a high incidence rate of overeducation can be ascribed to both labour supply and demand failures. The current findings have important implications for policy and practice, primarily in these two areas. From the supply perspective, the estimates of overeducation in the current study suggest that there is an oversupply of Saudi graduates, particularly in those fields which are in lower demand by the local labour market. Taken together with the observation that the skills acquired by many graduates do not usually match with those that their potential employers look for, there is a need for high-quality education based on linking the nature and number of university enrolments for specific degrees to the current and future labour market conditions, needs, and prospects. To bring the supply in line with the demand, there may be a need for universities to reduce admissions quotas in the fields of study that are in oversupply and have poor job prospects (i.e., fields with high rates of overeducation and unemployment). This should be coupled with providing students with first-hand information about career opportunities and expected returns on specific skills and majors.

From the demand perspective, the current overeducation patterns may indicate the rigidities and shortcomings of the labour market. There is a need for policies and strategies designed to address the limited absorptive capacity of graduates in the labour market (e.g., lack of employment growth). This warrants a major intervention intended to enhance both the employability and the employment opportunities for Saudi graduates, especially in the private, self-employment, and emerging sectors. Proper policies need also to be implemented to promote diversity in the demand side of the labour market by creating new jobs that demand more diverse qualifications; thus, accommodating more graduates in the labour market. This is, of course, with the assumption that these required new skills are already in supply; otherwise, the education system needs to adapt accordingly to respond to the newly created jobs.

Finally, supply–demand mismatch (and thus overeducation) is a complex problem for which there is no simple solution. Although different sources of failure in the labour and skill markets are distinguished above, the underlying conditions of either market failure are more likely to occur concurrently and interactively. A policy response (or set of policies) that is multifaceted and similarly interactive is required (EPoD, 2015). It may not be sufficient or even appropriate, especially in the case of Saudi Arabia, to only reform or restructure one side of the market to fit the other better.²² Rather, there might be a need to simultaneously reform both markets to fit each other in a mutually supportive way. Indeed, despite the Saudi government's several interventions and policy responses to address the rising gap between the supply and demand, these efforts have not been as comprehensive and overarching as they should be. To date, their rather selective and ad hoc nature has made them not particularly effective.

Perhaps, the gist of the problem in Saudi Arabia lies in the lack of an explicit linkage between the various supply- and demand-side stakeholders, which is a key prerequisite for formulating the right policy response and changing both systems to respond to one another effectively. Tied to this idea, the current labour market information system managed by GAS is inadequate. It primarily derives data from the Labour Force Survey, which merely produces

²¹ It is possible that some individuals overstated their education level to inflate their educational status, leading to an upward bias, while others might have overestimated their job's educational requirements, either to get or to do the job, to inflate their working status, creating a downward bias (e.g., Capsada-Munsech, 2019; Hartog, 2000).

²² Either by reshaping the skill market to meet whatever the labour market needs or by restructuring the labour market to fit whatever the skill market supplies (Murillo et al., 2012; Tarvid 2015).

general and inconclusive statistics about the labour market and is thus insufficient to provide adequate information for planners, policymakers, or even job seekers. There is a need to collect and analyse more in-depth empirical data about the current patterns of the labour market—for example, about graduates' employability, employment opportunities, and education and skills mismatches—which should be channelled into the labour market information system.

6. Conclusion

To conclude, overeducation is a costly problem for individuals, firms, and society. Given the current results, more education for Saudis is not necessarily better. There is a risk that, without proper alignment between the supply and demand for Saudi graduates, increasing educational attainment is most likely to result in a substantial waste of scarce human and financial resources, ultimately decreasing the relative market value of educational degrees. This study supports the argument in the literature that increasing the supply of graduates in the labour market does not guarantee the desired returns in terms of a highly skilled and competitive workforce that contributes to the country's economic growth (Congregado et al., 2016; Dolton & Vignoles, 2000; McGuinness, 2006). An improved understanding of these issues is vital for designing an effective policy response to the problem of overeducation. Toward this aim, this study incorporated two SA measures into its analysis of the incidence and determinants of overeducation. Despite its limitations, it represents the first known empirical attempt to thoroughly investigate the issue of overeducation in the Saudi labour market. Notwithstanding, at this point in the research stream, there is still very little evidence on overeducation and the conditions under which it is likely to occur and persist in Saudi Arabia. Further research is needed to expand our understanding of overeducation and its implications—particularly its determinants and impacts on wages and other personal, job, and career outcomes. A fruitful avenue for future research would be the investigation of overeducation among specific target groups in the labour market, who might be either the most or the least vulnerable to overeducation, such as long-term unemployed, self-employed, women, young individuals, and those with disabilities. Concurrently, it would also be interesting to examine the stability of the current results using objective measurement methods and a larger and more diverse sample of Saudi graduates in the labour market. Despite the data limitations in Saudi Arabia, further research building on the current study would undoubtedly provide valuable insights into these issues.

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Declaration of Interest

There is no conflict of interest to declare.

Data Availability Statement

The data that support the findings of this study are available from the author upon reasonable request. The data are not publicly available due to ongoing analyses for further publications.

References

- Acar, E. Ö. (2016). The effects of education-job mismatch on wages: A panel analysis of the Turkish labour market. *International Journal of Economics and Administrative Studies*, 1(18), 339–354. <https://doi.org/10.2016/Yayına>
- Akhtar, M., Javed, M., & Noreen, S. (2018). Analysis of education occupation mismatch at Pakistani educational institutions. *Journal of Educational Research*, 21(2), 175–189. <http://jer.iub.edu.pk/journals/JER-Vol-21.No-2/15.pdf>

- Al-Asmari, M. G. H. (2008). Saudi labor force: Challenges and ambitions. *JKAU: Arts & Humanities*, 16(2), 19–59.
- Aleksynska, M., & Tritah, A. (2013). Occupation-education mismatch of immigrant workers in Europe: Context and policies. *Economics of Education Review*, 36, 229–244. <https://doi.org/10.1016/j.econedurev.2013.06.001>
- Allen, J., & Van der Velden, R. (2001). Educational mismatches versus skill mismatches: Effects on wages, job satisfaction, and on-the-job search. *Oxford Economic Papers*, 3, 434–452. <https://doi.org/10.1093/oep/53.3.434>
- Alpin, C., Shackleton, J. R., & Walsh, S. (1998). Over- and undereducation in the UK graduate labour market. *Studies in Higher Education*, 23(1), 17–34. <https://doi.org/10.1080/03075079812331380462>
- Alzubaidi, M. A. (2020). The impact of overeducation on job outcomes: Evidence from Saudi Arabia. *International Journal of Research in Business and Social Science*, 9(4), 104–120. <https://doi.org/10.20525/ijrbs.v9i4.768>
- Badillo-Amador, L., García-Sánchez, A., & Vila, L. E. (2005). Mismatches in the Spanish labor market: Education vs. competence match. *International Advances in Economic Research*, 11(1), 93–109. <https://doi.org/10.1007/s11294-004-7491-z>
- Baert, S., Cockx, B., & Verhaest, D. (2013). Overeducation at the start of the career: Stepping stone or trap? *Labour Economics*, 25, 123–140. <https://doi.org/10.1016/j.labeco.2013.04.013>
- Barro, R. (2001). Human capital and growth. *American Economic Review*, 91(2), 12–17. <https://doi.org/10.1257/aer.91.2.12>
- Battu, H., Sloane, P. J., & Belfield, C. R. (2000). How well can we measure graduate over-education and its effects? *National Institute Economic Review*, 171(1), 82–93. <https://doi.org/10.1177/002795010017100107>
- Belfield, C. (2010). Over-education: What influence does the workplace have? *Economics of Education Review*, 29(2), 236–245. <https://doi.org/10.1016/j.econedurev.2009.08.001>
- Box, G. E. P., & Tidwell, P. W. (1962). Transformation of the independent variables. *Technometrics*, 4(4), 531–550. <https://doi.org/10.1080/00401706.1962.10490038>
- Budría, S., & Moro-Egido, A. I. (2018). Qualification and skill mismatches: Europe in a cross-national perspective. *Cuadernos Económicos de ICE*, 95, 151–188. <https://doi.org/10.32796/cice.2018.95.6646>
- Capsada-Munsech, Q. (2015). The role of social origin and field of study on graduates' overeducation: the case of Italy. *Higher Education*, 69(5), 779–807. <https://doi.org/10.1007/s10734-014-9805-2>
- Capsada-Munsech, Q. (2017). Overeducation: Concept, theories, and empirical evidence. *Sociology Compass*, 11(10), 1–17. <https://doi.org/10.1111/soc4.12518>
- Capsada-Munsech, Q. (2019). Measuring Overeducation: Incidence, Correlation and Overlaps Across Indicators and Countries. *Social Indicators Research*, 145(1), 279–301. <https://doi.org/10.1007/s11205-019-02112-0>
- Caroleo, F. E., & Pastore, F. (2018). Overeducation at a glance. Determinants and wage effects of the educational mismatch based on AlmaLaurea data. *Social Indicators Research*, 137(3), 999–1032. <https://doi.org/10.1007/s11205-017-1641-1>
- Carroll, D., & Tani, M. (2013). Over-education of recent higher education graduates: New Australian panel evidence. *Economics of Education Review*, 32(1), 207–218. <https://doi.org/10.1016/j.econedurev.2012.10.002>
- Castagnetti, C., Rosti, L., & Töpfer, M. (2018). Overeducation and the gender pay gap in Italy. *International Journal of Manpower*, 39(5), 710–730. <https://doi.org/10.1108/IJM-12-2016-0235>
- Cattani, L., Guidetti, G., & Pedrini, G. (2018). Overeducation among Italian graduates: Do different measures diverge? *Economia Politica*, 35(2), 491–521. <https://doi.org/10.1007/s40888-017-0075-1>
- Center for Statistical Research. (2010). *Dirasat Mla'emht Khariji Mu'asasat Al-t'elym w Al-tadrib Li-mutatalabat Suq Al-amal B'almamlakh Al-arabiah Al-saeudia* [A study of the suitability of graduates of education and training institutions to the requirements of the labour market in the Kingdom of Saudi Arabia]. National Observatory for Labor, Ministry of Labor.
- Chevalier, A. (2003). Measuring over-education. *Economica*, 70(279), 509–531. <https://doi.org/10.1111/1468-0335.t01-1-00296>
- Chevalier, A., & Lindley, J. (2009). Overeducation and the skills of UK graduates. *Journal of the Royal Statistical Society: Series A (Statistics in Society)*, 172(2), 307–37. <https://doi.org/10.1111/j.1467-985X.2008.00578.x>
- Congregado, E., Iglesias, J., Millán, J. M., & Román, C. (2016). Incidence, effects, dynamics and routes out of overqualification in Europe: a comprehensive analysis distinguishing by employment status. *Applied Economics*, 48(5), 411–445. <https://doi.org/10.1080/00036846.2015.1083080>
- Davia, M. A., McGuinness, S., & O'Connell, P. J. (2017). Determinants of regional differences in rates of overeducation in Europe. *Social Science Research*, 63, 67–80. <https://doi.org/10.1016/j.ssresearch.2016.09.009>

- Dekker, R., De Grip, A., & Heijke, H. (2002). The effects of training and overeducation on career mobility in a segmented labour market. *International Journal of Manpower*, 23(2), 106-125. <https://doi.org/10.1108/01437720210428379>
- Di Paolo, A., & Mañé, F. (2016). Misusing our talent? Overeducation, overskilling and skill underutilisation among Spanish PhD graduates. *Economic and Labour Relations Review*, 27(4), 432–452. <https://doi.org/10.1177/1035304616657479>
- Dolton, P. J., & Vignoles, A. (1997). *Overeducation duration: how long did graduates in the 1980s take to get a graduate job?* (Working Paper). University of Newcastle upon Tyne.
- Dolton, P., & Silles, M. (2001). *Over-education in the graduate labour market: Some evidence from alumni data*. Centre for the Economics of Education, London School of Economics and Political Science. <http://cee.lse.ac.uk/ceedps/CEEDP09.pdf>
- Dolton, P., & Silles, M. (2008). The effects of over-education on earnings in the graduate labour market. *Economics of Education Review*, 27(2), 125–139. <https://doi.org/10.1016/j.econedurev.2006.08.008>
- Dolton, P., & Vignoles, A. (2000). The incidence and effects of overeducation in the U.K. graduate labour market. *Economics of Education Review*, 19(2), 179–198. [https://doi.org/10.1016/S0272-7757\(97\)00036-8](https://doi.org/10.1016/S0272-7757(97)00036-8)
- Duman, A. (2018). Education mismatches in the labor markets and their impact on wages across sectors: evidence from Turkey. *Sosyoekonomi*, 26(37), 227–242. <https://doi.org/10.17233/sosyoekonomi.2018.03.13>
- Duncan, G. J., & Hoffman, S. D. (1981). The incidence and wage effects of overeducation. *Economics of Education Review*, 1(1), 75–86. [https://doi.org/10.1016/0272-7757\(81\)90028-5](https://doi.org/10.1016/0272-7757(81)90028-5)
- Edwards, J. R. (1991). Person-job fit: A conceptual integration, literature review, and methodological critique. In C. L. Cooper et al (Eds.), *International Review of Industrial and Organizational Psychology* (pp. 283–357). John Wiley & Sons.
- El-Hamidi, F. (2009). *Education-occupation mismatch and the effect on wages of Egyptian workers* (ERF Working Paper Series No. 474). Economic Research Forum. <https://erf.org.eg/publications/education-occupation-mismatch-effect-wages-egyptian-workers>
- Evidence for Policy Design, Harvard Kennedy School. (2015). *Back to work in a new economy: Background paper on the Saudi labor market*. Ministry of Labor and Human Resources Development Fund. https://epod.cid.harvard.edu/sites/default/files/inline-files/hks-mol_background_paper_-_full_-_april_2015.pdf
- Farooq, S. (2011). Mismatch between education and occupation: A case study of Pakistani graduates. *Pakistan Development Review*, 50(4), 531–553. <https://doi.org/10.30541/v50i4Ipp.531-553>
- Farooq, S., & Ahmed, U. (2007). Underemployment, education, and job satisfaction. *Pakistan Development Review*, 46(4), 895–907. <https://doi.org/10.30541/v46i4Ipp.895-907>
- Feldman, D. C. (1996). The nature, antecedents and consequences of underemployment. *Journal of Management*, 22(3), 385–407. [https://doi.org/10.1016/S0149-2063\(96\)90030-6](https://doi.org/10.1016/S0149-2063(96)90030-6)
- Flisi, S., Goglio, V., Meroni, E. C., Rodrigues, M., & Vera-Toscano, E. (2017). Measuring occupational mismatch: overeducation and overskill in Europe—evidence from PIAAC. *Social Indicators Research*, 131(3), 1211–1249. <https://doi.org/10.1007/s11205-016-1292-7>
- Frank, R. H. (1978). Why women earn less: The theory and estimation of differential overqualification. *American Economic Review*, 68(3), 360–373. <http://www.jstor.org/stable/1805267>
- General Authority for Statistics. (2019). *Labour market bulletins: Third quarter*. https://stats.gov.sa/sites/default/files/labour_market_3q_2019.pdf
- Görg, H., & Strobl, E. (2003). The incidence of visible underemployment: Evidence for Trinidad and Tobago. *Journal of Development Studies*, 39(3), 37–41. <https://doi.org/10.1080/00220380412331322831>
- Green, F., & McIntosh, S. (2007). Is there a genuine under-utilization of skills amongst the over-qualified? *Applied Economics*, 39(4), 427–439. <https://doi.org/10.1080/00036840500427700>
- Green, F., & Zhu, Y. (2010). Overqualification, job dissatisfaction, and increasing dispersion in the returns to graduate education. *Oxford Economic Papers*, 62(4), 740–763. <https://doi.org/10.1093/oepp/gpq002>
- Green, F., McIntosh, S., & Vignoles, A. (1999). *Overeducation and skills - clarifying the concepts* (CEP Discussion Paper No. 435). Centre for Economic Performance, London School of Economics and Political Science. <http://eprints.lse.ac.uk/id/eprint/20210>
- Green, F., McIntosh, S., & Vignoles, A. (2002). The utilization of education and skills: evidence from Britain. *The Manchester School*, 70(6), 792–811. <https://doi.org/10.1111/1467-9957.00325>
- Groot, W., & Maassen van den Brink, H. (2000). Overeducation in the labor market: A meta-analysis. *Economics of Education Review*, 19(2), 149–158. [https://doi.org/10.1016/S0272-7757\(99\)00057-6](https://doi.org/10.1016/S0272-7757(99)00057-6)
- Habibi, N. (2015, July 15). Is Saudi Arabia training too many university graduates? *University World News*. <https://universityworldnews.com/post.php?story=20150714013422488>
- Habibi, N., & El-Hamidi, F. (2016). *Why are Egyptian youth burning their university diplomas? The overeducation crisis in Egypt* (Middle East Brief No. 102). Crown Center for the Middle East Studies, Brandeis University. <https://doi.org/10.2139/ssrn.3054086>

- Haddad, G. R. K., & Habibi, N. (2017). Vertical skill mismatch and wage consequences in low-skilled jobs: Evidence from Iran. *International Labour Review*, 156(1), 45–72. <https://doi.org/10.1111/ilr.12000>
- Handel, M. J., Valerio, A., & Puerta, M. L. S. (2016). *Accounting for mismatch in low- and middle-income countries: Measurement, magnitudes, and explanations*. World Bank Group. <https://doi.org/10.1596/978-1-4648-0908-8>
- Hartog, J. (2000). Over-education and earnings: Where are we, where should we go? *Economics of Education Review*, 19(2), 131–147. [https://doi.org/10.1016/S0272-7757\(99\)00050-3](https://doi.org/10.1016/S0272-7757(99)00050-3)
- Hersch, J. (1995). Optimal mismatch and promotions. *Economic Inquiry*, 33(4), 611–624. <https://doi.org/10.1111/j.1465-7295.1995.tb01884.x>
- Kthiri, W. (2019). *Over-education in the Tunisian labour market: Characteristics and determinants* (EMNES Working Paper No. 22). Euro-Mediterranean Network for Economic Studies. <https://www.euneighbours.eu/en/south/stay-informed/publications/emnes-working-paper-22-over-education-tunisian-labour-market>
- Leana, C. R., & Feldman, D. C. (1995). Finding new jobs after a plant closing: Antecedents and outcomes of the occurrence and quality of reemployment. *Human Relations*, 48(12), 1381–1401. <https://doi.org/10.1177/001872679504801201>
- Leuven, E., & Oosterbeek, H. (2011). Over-education and mismatch in the labor market. In E. Hanusek et al (Eds.), *Handbook of the Economics of Education* (pp. 282–386). Elsevier. <https://doi.org/10.1016/B978-0-444-53444-6.00003-1>
- Li, I. W., & Miller, P. W. (2015). Overeducation and earnings in the Australian graduate labour market: An application of the Vahey model. *Education Economics*, 23(1), 63–83. <https://doi.org/10.1080/09645292.2013.772954>
- Lim, H. E. (2013). Overeducation and gappiness in the Malaysian graduate labour market. *International Journal of Business and Society*, 14(1), 93–110. <http://repo.uum.edu.my/id/eprint/10104>
- Linsley, I. (2005). Causes of overeducation in the Australian labour market. *Australian Journal of Labour Economics*, 8(2), 121–143.
- Luksyte, A., & Spitzmueller, C. (2011). Behavioral science approaches to studying underemployment. In D. C. Maynard & D. C. Feldman (Eds.), *Underemployment: Psychological, Economic, and Social Challenges* (pp. 35–56). Springer. https://doi.org/10.1007/978-1-4419-9413-4_3
- Mason, G. (1996). Graduate utilisation in British industry: The initial impact of mass higher education. *National Institute Economic Review*, 156(1), 93–103. <https://doi.org/10.1177/002795019615600108>
- Mavromaras, K., McGuinness, S., O’Leary, N., Sloane, P., & Fok, Y. K. (2010). The problem of overskilling in Australia and Britain. *The Manchester School*, 78(3), 219–241. <https://doi.org/10.1111/j.1467-9957.2009.02136.x>
- Maynard, D. C., Joseph, T. A., & Maynard, A. M. (2006). Underemployment, job attitudes, and turnover intentions. *Journal of Organizational Behavior*, 27(4), 509–536. <https://doi.org/10.1002/job.389>
- McGoldrick, K., & Robst, J. (1996). Gender differences in overeducation: A test of the theory of differential overqualification. *American Economic Review*, 86(2), 280–284. <https://jstor.org/stable/2118137>
- McGuinness, S. (2006). Overeducation in the labour market. *Journal of Economic Surveys*, 20(3), 387–419. <https://doi.org/10.1111/j.0950-0804.2006.00284.x>
- McGuinness, S., Bergin, A., & Whelan, A. (2018). Overeducation in Europe: Trends, convergence, and drivers. *Oxford Economic Papers*, 70(4), 994–1015. <https://doi.org/10.1093/oep/gpy022>
- McGuinness, S., Pouliakas, K., & Redmond, P. (2018). Skills mismatch: Concepts, measurement and policy approaches. *Journal of Economic Surveys*, 32(4), 985–1015. <https://doi.org/10.1111/joes.12254>
- Mehta, A., Felipe, J., Quising, P., & Camingue, S. (2011). Overeducation in developing economies: How can we test for it, and what does it mean? *Economics of Education Review*, 30(6), 1334–1347. <https://doi.org/10.1016/j.econedurev.2011.06.004>
- Mercan, M. A., Karakas, M., Citci, S. H., & Babacan, M. (2015). Sector-based analysis of the education-occupation mismatch in the Turkish labor market. *Educational Sciences: Theory & Practice*, 15(2), 397–407. <https://doi.org/10.12738/estp.2015.2.2362>
- Ministry of Education. (2020). *Higher education statistics (1980–2018)* [Electronic data set]. <https://departments.moe.gov.sa/Statistics/Educationstatistics/Pages/HEStats.aspx>
- Ministry of Finance. (2020). *Budget statement: Fiscal year 2020*. <https://www.mof.gov.sa/en/financialreport/budget2020/Documents/Bud-Eng2020.pdf>
- Ministry of Labor and Social Development. (2016). *Saudi Arabia labor market report 2016* (3rd ed.).
- Murillo, I. P., Rahona-López, M., & Salinas-Jiménez, M. del M. (2012). Effects of educational mismatch on private returns to education: An analysis of the Spanish case (1995–2006). *Journal of Policy Modeling*, 34(5), 646–659. <https://doi.org/10.1016/j.jpolmod.2011.07.012>
- Nielsen, C. P. (2011). Immigrant over-education: Evidence from Denmark. *Journal of Population Economics*, 24(2), 499–520. <https://doi.org/10.1007/s00148-009-0293-0>

- Organisation for Economic Co-operation and Development. (2020). *Education at a glance 2020: OECD indicators*. OECD Publishing. <https://doi.org/10.1787/69096873-en>
- Ortiz, L., & Kucel, A. (2008). Do fields of study matter for over-education? The cases of Spain and Germany. *International Journal of Comparative Sociology*, 49(4–5), 305–327. <https://doi.org/10.1177/0020715208093079>
- Psacharopoulos, G. (1994). Returns to investment in education: A global update. *World Development*, 22(9), 1325–1343. [https://doi.org/10.1016/0305-750x\(94\)90007-8](https://doi.org/10.1016/0305-750x(94)90007-8)
- Quinn, M. A., & Rubb, S. (2006). Mexico's labor market: The importance of education-occupation matching on wages and productivity in developing countries. *Economics of Education Review*, 25(2), 147–156. <https://doi.org/10.1016/j.econedurev.2005.01.003>
- Quintini, G. (2011). *Over-qualified or under-skilled: A review of existing literature* (OECD Social, Employment and Migration Working Papers No. 121). OECD. <http://ideas.repec.org/p/oec/elsaab/121-en.html>
- Reimer, D., Noelke, C., & Kucel, A. (2008). Labor market effects of field of study in comparative perspective: An analysis of 22 European countries. *International Journal of Comparative Sociology*, 49(4–5), 233–256. <https://doi.org/10.1177/0020715208093076>
- Robst, J. (2008). Overeducation and college major: Expanding the definition of mismatch between schooling and jobs. *The Manchester School*, 76(4), 349–368 <https://doi.org/10.1111/j.1467-9957.2008.01064.x>
- Sadeq, T. (2014). *Formal-informal gap in return to schooling and penalty to education-occupation mismatch: A comparative study for Egypt, Jordan, and Palestine* (ERF Working Paper Series No. 894). Economic Research Forum. <https://erf.org.eg/app/uploads/2015/12/894.pdf>
- Salinas-Jiménez, M. del M., Artés, J., & Salinas-Jiménez, J. (2016). Educational mismatch and job aspirations: A subjective wellbeing analysis using quantile regression. *International Journal of Manpower*, 37(1), 115–134. <https://doi.org/10.1108/IJM-12-2014-0266>
- Sam, V. (2018). *Impacts of educational mismatches in developing countries with a focus on Cambodia* (HAL Id: tel-02136222) [Doctoral dissertation, Université Grenoble Alpes]. HAL archives-ouvertes. <https://tel.archives-ouvertes.fr/tel-02136222>
- Sicherman, N. (1991). Overeducation in the labor market. *Journal of Labor Economics*, 9(2), 101–122. <https://doi.org/10.1086/298261>
- Sparreboom, T., & Staneva, A. A. (2014). *Is education the solution to decent work for youth in developing economies? Identifying qualifications mismatch from 28 school-to-work transition surveys* (ILO Work4Youth Publication Series No. 23). International Labour Office. <https://un.org/youthenvoy/wp-content/uploads/2014/10/Work4Youth-Publication.pdf>
- Tarvid, A. (2015). The role of industry in the prevalence of overeducation in Europe. *Procedia Economics and Finance*, 30(15), 876–884. [https://doi.org/10.1016/S2212-5671\(15\)01337-4](https://doi.org/10.1016/S2212-5671(15)01337-4)
- Turmo-Garuz, J., Bartual-Figueras, M. T., & Sierra-Martinez, F. J. (2019). Factors associated with overeducation among recent graduates during labour market integration: The case of Catalonia (Spain). *Social Indicators Research*, 144, 1273–1301. <https://doi.org/10.1007/s11205-019-02086-z>
- Vahey, S. P. (2000). The great Canadian training robbery: Evidence on the returns to educational mismatch. *Economics of Education Review*, 19(2), 219–227. [https://doi.org/10.1016/S0272-7757\(98\)00029-6](https://doi.org/10.1016/S0272-7757(98)00029-6)
- van der Velden, R. K. W., & van Smoorenburg, M. S. M. (1997). *The measurement of overeducation and undereducation: Self-report vs. job-analyst method* (ROA Research Memoranda No. 2E). Research Centre for Education and the Labour Market, Maastricht University. <https://ideas.repec.org/p/unm/umaror/1997002.html>
- Velasco, M. (2000). *Evidence on graduate over-education in Europe: Underutilization of educational skills and unrealized expectations*, La Asociación Libre de Economía. <http://alde.es/encuentros/anteriores/xeea/trabajos/s/pdf/044.pdf>
- Verhaest, D., & Omeij, E. (2006). Discriminating between alternative measures of over-education. *Applied Economics*, 38(18), 2113–2120. <https://doi.org/10.1080/00036840500427387>
- Verhaest, D., & Omeij, E. (2006a). The impact of overeducation and its measurement. *Social Indicators Research*, 77(3), 419–448. <https://doi.org/10.1007/s11205-005-4276-6>
- Verhaest, D., & Omeij, E. (2010). The determinants of overeducation: Different measures, different outcomes? *International Journal of Manpower*, 31(6), 608–625. <https://doi.org/10.1108/01437721011073337>
- Verhaest, D., & van der Velden, R. (2013). Cross-country differences in graduate overeducation. *European Sociological Review*, 29(3), 642–653. <https://doi.org/10.1093/esr/jcs044>
- Yang, J., & Mayston, D. (2012). Impact of overeducation on wages in China. *Chinese Economy*, 45(2), 65–89. <https://doi.org/10.2753/CES1097-1475450204>
- Zakariya, Z. (2017). Job mismatch and on-the-job search behavior among university graduates in Malaysia. *Asian Economic Journal*, 31(4), 355–379. <https://doi.org/10.1111/asej.12135>
- Zakariya, Z. (2019). Returns to education: What does over-education play? *Journal of Contemporary Issues and Thought*, 3(1), 138–155. <http://myjournal.my/public/article-view.php?id=83999>

Zakariya, Z., & Battu, H. (2013). The effects of overeducation on multiple job satisfaction towards enhancing individuals' well-being in Malaysia. *Business Management Quarterly Review*, 4(3 & 4), 36–51.
<http://ir.uitm.edu.my/id/eprint/8743>

Appendix

Table A1. Descriptive statistics of the study sample

Characteristic	<i>n</i>	%
Sex		
Female	175	26.8
Male	478	73.2
Age (years)		
20–29	222	34
30–39	258	39.5
40–49	114	17.5
≥ 50	59	9
Marital status		
Single ^a	266	40.7
Married	387	59.3
Administrative region		
Riyadh	152	23.3
Makkah	367	56.2
Eastern	59	9
Other ^b	75	11.5
Education level		
Secondary school degree	52	8
Diploma	59	9
Bachelor's degree	300	45.9
Higher diploma or master's degree ^c	126	19.3
Doctorate or equivalent	116	17.8
Field of study		
General fields of study	50	7.7
Education	47	7.2
Humanities, languages, and arts	88	13.5
Social sciences, business, and law	227	34.8
Science, mathematics, and computing	125	19.2
Engineering, manufacturing, and construction	71	10.9
Health and welfare	45	6.9
Overseas study(s)		
Yes ^d	209	32
No	444	68
Previous unemployment		
0 time	317	48.5
1 time	174	26.6
2 times	84	12.9
≥ 3 times	78	11.9
Institutional sector		
Public	295	45.2
Private	338	51.8
Other ^e	20	3.1
Industry		
Manufacturing	20	3.1
Construction	38	5.8
Wholesale and retail trade; repair of motor vehicles and motorcycles	72	11
Transportation and storage	23	3.5

(Continued on the next page)

Table A1. (continued)

Characteristic	<i>n</i>	%
Accommodation and food service activities	25	3.8
Information and communication	32	4.9
Financial and insurance activities	28	4.3
Professional, scientific, and technical activities	45	6.9
Administrative and support service activities	29	4.4
Public administration and defence; compulsory social security	65	10
Education	159	24.3
Human health and social work activities	56	8.6
Other service activities	26	4
Other ^f	35	5.4
Job status		
Part-time	53	8.1
Full-time	600	91.9
Job contract		
Temporary or contract	254	38.9
Permanent	399	61.1
Work experience (years)		
< 5	339	51.9
5–9	146	22.4
10–14	76	11.6
15–19	44	6.7
≥ 20	48	7.4

Note. *N* = 653. Percentages are rounded up to the nearest tenth.

^aSingle includes also divorced and widowed. ^bOther regions include Madinah, Qassim, Asir, Tabuk, Northern Borders, Hail, Jazan, Najran, Al Baha, and Al Jouf. ^cSeventeen of the respondents (2.6%) had a higher diploma degree, while 108 held a master's degree (16%). ^dCountries of graduation include the United States, the United Kingdom, Australia, Austria, Canada, France, Germany, Egypt, Ireland, Sweden, Switzerland, Spain, China, Japan, Malaysia, Bahrain, Kuwait, Jordan, Oman, and Yemen. ^eOther sectors include the non-profit organisation sector, and the sector containing regional and international organisations and institutions. ^fOther industries include agriculture, forestry, and fishing; mining and quarrying; electricity, gas, steam, and air conditioning supply; water supply, sewerage, waste management, and remediation activities; real estate activities; arts, entertainment, and recreation; and the activities of extraterritorial organisations and bodies.

Table A2. Descriptive statistics of the incidence of overeducation across individual and job characteristics

Characteristic	ISA		DSA	
	<i>n</i>	%	<i>n</i>	%
All observations	313	47.9	328	50.2
Sex				
Female	78	44.6	80	45.7
Male	235	49.2	248	51.9
Age (years)				
20–29	125	56.3	138	62.2
30–39	125	48.4	132	51.2
40–49	47	41.2	47	41.2
≥ 50	16	27.1	11	18.6
Marital status				
Single	142	53.4	162	60.9
Married	171	44.2	166	42.9
Administrative region				
Riyadh	72	47.4	77	50.7
Makkah	164	44.7	174	47.4
Eastern	32	54.2	31	52.5
Other	45	60.0	46	61.3
Education level				
Secondary school degree	23	44.2	38	73.1
Diploma	23	39.0	29	49.2
Bachelor's degree	154	51.3	170	56.7
Higher diploma or master's degree	89	70.6	68	54.0
Doctorate or equivalent	24	20.7	23	19.8
Field of study				
General fields of study	23	46.0	37	74.0
Education	19	40.4	18	38.3
Humanities, languages, and arts	41	46.6	45	51.1
Social sciences, business, and law	145	63.9	143	63.0
Science, mathematics, and computing	45	36.0	46	36.8
Engineering, manufacturing, and construction	27	38.0	28	39.4
Health and welfare	13	28.9	11	24.4
Overseas study(s)				
Yes	75	35.9	68	32.5
No	238	53.6	260	58.6
Previous unemployment				
0 time	136	42.9	120	37.9
1 time	82	47.1	94	54.0
2 times	42	50.0	54	64.3
≥ 3 times	53	67.9	60	76.9
Institutional sector				
Public	108	36.6	100	33.9
Private	189	55.9	214	63.3
Other	16	80.0	14	70.0
Industry				
Manufacturing	12	60.0	9	45.0
Construction	19	50.0	20	52.6
Wholesale and retail trade; repair of motor vehicles and motorcycles	54	75.0	61	84.7

(Continued on the next page)

Table A2. (continued)

Characteristic	ISA		DSA	
	<i>n</i>	%	<i>n</i>	%
Transportation and storage	17	73.9	20	87.0
Accommodation and food service activities	16	64.0	18	72.0
Information and communication	11	34.4	11	34.4
Financial and insurance activities	9	32.1	14	50.0
Professional, scientific, and technical activities	27	60.0	22	48.9
Administrative and support service activities	17	58.6	21	72.4
Public administration and defence; compulsory social security	42	64.6	43	66.2
Education	27	17.0	22	13.8
Human health and social work activities	27	48.2	26	46.4
Other service activities	17	65.4	18	69.2
Other	18	51.4	23	65.7
Job status				
Part-time	31	58.5	37	69.8
Full-time	282	47.0	291	48.5
Job contract				
Temporary or contract	155	61.0	169	66.5
Permanent	158	39.6	159	39.8
Work experience (years)				
< 5	187	55.2	202	59.6
5–9	66	45.2	65	44.5
10–14	29	38.2	34	44.7
15–19	17	38.6	16	36.4
≥ 20	14	29.2	11	22.9

Note. *N* = 653. ISA, indirect self-assessment; DSA, direct self-assessment. Percentages are rounded up to the nearest tenth.

Table A3. Logistic regression analysis of the determinants of overeducation (ISA)

Independent variable	B	SE	Wald's χ^2	Odds ratio	95% CI for odds ratio	
					Lower	Upper
Sex (ref. male)	0.004	0.236	0.000	1.004	0.632	1.594
Age (years)	0.008	0.017	0.233	1.008	0.975	1.042
Marital status (ref. married)	-0.119	0.236	0.256	0.888	0.560	1.408
Administrative region (ref. Riyadh)						
Makkah	0.038	0.235	0.026	1.039	0.655	1.646
Eastern	0.358	0.364	0.966	1.430	0.701	2.919
Other	0.299	0.355	0.713	1.349	0.673	2.702
Education level	0.757***	0.131	33.452	2.132	1.650	2.756
Field of study (ref. general fields of study)						
Education	-0.356	0.621	0.329	0.700	0.207	2.366
Humanities, languages, and arts	-0.770	0.510	2.280	0.463	0.171	1.258
Social sciences, business, and law	-0.282	0.451	0.391	0.754	0.312	1.825
Science, mathematics, and computing	-1.024*	0.481	4.528	0.359	0.140	0.922
Engineering, manufacturing, and construction	-1.491**	0.511	8.511	0.225	0.083	0.613
Health and welfare	-1.777**	0.653	7.408	0.169	0.047	0.608
Overseas study (ref. no)	-0.831**	0.296	7.880	0.436	0.244	0.778
Previous unemployment	0.079	0.084	0.877	1.082	0.917	1.277
Institutional sector (ref. public)						
Private	0.471	0.319	2.181	1.601	0.857	2.991
Other	1.618*	0.728	4.935	5.041	1.210	21.007
Industry (ref. manufacturing)						
Construction	-0.548	0.629	0.759	0.578	0.168	1.985
Wholesale and retail trade; repair of motor vehicles and motorcycles	0.487	0.608	0.642	1.628	0.494	5.361
Transportation and storage	0.267	0.741	0.130	1.306	0.306	5.577
Accommodation and food service activities	-0.177	0.700	0.064	0.838	0.213	3.305
Information and communication	-1.260	0.675	3.486	0.284	0.076	1.065
Financial and insurance activities	-1.709*	0.698	6.000	0.181	0.046	0.711
Professional, scientific, and technical activities	-0.543	0.643	0.713	0.581	0.165	2.049
Administrative and support service activities	-0.506	0.677	0.558	0.603	0.160	2.275
Public administration and defence; compulsory social security	0.334	0.664	0.254	1.397	0.380	5.132
Education	-3.013***	0.664	20.562	0.049	0.013	0.181
Human health and social work activities	-0.745	0.662	1.266	0.475	0.130	1.738
Other service activities	-0.423	0.714	0.351	0.655	0.162	2.654
Other	-0.331	0.637	0.271	0.718	0.206	2.500

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Table A3. (continued)

Independent variable	<i>B</i>	SE	Wald's χ^2	Odds ratio	95% CI for odds ratio	
					Lower	Upper
Job status (ref. full-time)	-0.447	0.374	1.431	0.639	.307	1.330
Job contract (ref. permanent)	0.684**	0.252	7.375	1.983	1.210	3.249
Work experience	0.010	0.120	0.006	1.010	0.799	1.276
Constant	-2.723**	0.898	9.190	0.066		
Model χ^2	208.5***					
<i>df</i>	33					
Nagelkerke R^2	0.365					
<i>Classification</i>						
Overall	74.3%					
Adequately educated	75.6%					
Overeducated	72.8%					

Note. $N = 653$. The dependent variable, ISA, indirect self-assessment, was coded as 0 = adequately educated, 1 = overeducated; sex was coded as 0 = male, 1 = female; marital status was coded as 0 = married, 1 = single; overseas study was coded as 0 = no, 1 = yes; job status was coded as 0 = full-time, 1 = part-time; job contract was coded as 0 = permanent job, 1 = temporary or contract job. Age was measured in years; education level, previous unemployment, and work experience were measured at ordinal level (6, 6, and 5 levels, respectively) and treated as contentious variables. All statistics reported herein use 3 decimal places to maintain statistical precision.

* $p < .05$, ** $p < .01$, *** $p < .001$.

Table A4. Logistic regression analysis of the determinants of overeducation (DSA)

Independent variable	B	SE	Wald's χ^2	Odds ratio	95% CI for odds ratio	
					Lower	Upper
Sex (ref. male)	-0.170	0.242	0.494	0.843	0.525	1.356
Age (years)	-0.019	0.017	1.191	0.981	0.949	1.015
Marital status (ref. married)	0.055	0.240	0.052	1.056	0.660	1.689
Administrative region (ref. Riyadh)						
Makkah	0.269	0.241	1.252	1.309	0.817	2.097
Eastern	-0.004	0.373	0.000	0.996	0.480	2.070
Other	0.235	0.360	0.425	1.265	0.624	2.562
Education level	0.485***	0.126	14.830	1.624	1.269	2.078
Field of study (ref. general fields of study)						
Education	-0.446	0.665	0.449	0.640	0.174	2.359
Humanities, languages, and arts	-0.940	0.544	2.991	0.391	0.135	1.134
Social sciences, business, and law	-0.985*	0.488	4.077	0.373	0.144	0.971
Science, mathematics, and computing	-1.443**	0.520	7.714	0.236	0.085	0.654
Engineering, manufacturing, and construction	-1.932***	0.538	12.889	0.145	0.050	0.416
Health and welfare	-2.373**	0.686	11.982	0.093	0.024	0.357
Overseas study (ref. no)	-0.369	0.296	1.554	0.691	0.387	1.235
Previous unemployment	0.221**	0.091	5.944	1.247	1.044	1.489
Institutional sector (ref. public)						
Private	0.567	0.309	3.373	1.763	0.963	3.229
Other	0.490	0.668	0.537	1.632	0.440	6.050
Industry (ref. manufacturing)						
Construction	0.242	0.607	0.159	1.274	0.388	4.186
Wholesale and retail trade; repair of motor vehicles and motorcycles	1.529**	0.609	6.309	4.615	1.399	15.217
Transportation and storage	1.983**	0.823	5.803	7.265	1.447	36.472
Accommodation and food service activities	0.653	0.688	0.900	1.921	0.499	7.395
Information and communication	-0.498	0.641	0.604	0.607	0.173	2.135
Financial and insurance activities	0.101	0.652	0.024	1.106	0.308	3.972
Professional, scientific, and technical activities	0.034	0.612	0.003	1.034	0.312	3.431
Administrative and support service activities	0.865	0.680	1.620	2.375	0.627	9.003
Public administration and defence; compulsory social security	1.214	0.636	3.641	3.368	0.968	11.725
Education	-1.948**	0.632	9.488	0.143	0.041	0.492
Human health and social work activities	0.397	0.638	0.386	1.487	0.426	5.193
Other service activities	0.558	0.701	0.635	1.748	0.443	6.900
Other	1.036	0.624	2.758	2.817	0.830	9.563

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Table A4. (continued)

Independent variable	<i>B</i>	SE	Wald's χ^2	Odds ratio	95% CI for odds ratio	
					Lower	Upper
Job status (ref. full-time)	-0.062	0.400	0.024	0.940	0.429	2.059
Job contract (ref. permanent)	0.559**	0.255	4.815	1.750	1.062	2.884
Work experience	0.138	0.120	1.321	1.148	0.907	1.453
Constant	-1.790	0.908	3.884	0.167		
Model χ^2	229.848***					
<i>df</i>	33					
Nagelkerke R^2	0.396					
<i>Classification</i>						
Overall	74.3%					
Adequately educated	71.4%					
Overeducated	77.1%					

Note. $N = 653$. The dependent variable, ISA, indirect self-assessment, was coded as 0 = adequately educated, 1 = overeducated; sex was coded as 0 = male, 1 = female; marital status was coded as 0 = married, 1 = single; overseas study was coded as 0 = no, 1 = yes; job status was coded as 0 = full-time, 1 = part-time; job contract was coded as 0 = permanent job, 1 = temporary or contract job. Age was measured in years; education level, previous unemployment, and work experience were measured at ordinal level (6, 6, and 5 levels, respectively) and treated as contentious variables. All statistics reported herein use 3 decimal places to maintain statistical precision.

* $p < .05$, ** $p < .01$, *** $p < .001$.