

# Overeducation in Arab Labour Markets; Different Measures, Different Outcomes

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## Abstract

Since the introduction of the topic of overeducation, there has been a methodological debate on the most effective measurement tool. This debate has concluded that there is no single most appropriate method to measure overeducation, which depends entirely on data availability. By using the Integrated Labour Market Panel Survey (ILMPS) for Egypt (1998-2018), Jordan (2010-2016) and Tunisia (2014), this paper contributes to the existing literature on overeducation by measuring it across a sample of Arab countries using different methods as specified in the literature. The results reveal that the incidence of overeducation significantly varies across the measures. The subjective WA approach yielded the highest incidence of overeducation among the measures, whereas JA approach produced the lowest incidence. The RM approach, however, fell in a middle between the two other approaches and captured the region's political conflict and social unrest. Moreover, the Spearman rank correlation between the measurements was relatively low, indicating short overlaps among workers categorized as overeducated across measures.

*Keywords: Overeducation, Arab countries, Workers' self-Assessment, Job analyst, Realized Matches.*

## 1. Introduction

Educational growth has been viewed as fundamentally beneficial, fostering a knowledge society and having a positive impact on the economic, social, political, and health dimensions of life (OECD, 2017). However, expansion in education has come at a cost. The surplus of educated workers relative to labour market demand has compelled workers to accept jobs for which they are overqualified. (Freeman, 1976), for example, detected mismatches between the education level entailed by employers and the education level of the individuals recruited in the form of overeducation.

Overeducation can be defined as a situation in which workers perform a job whose educational requirements are lower than their own academic education level (Capsada-Munsech, 2017; Hartog, 2000; McGuinness, 2006; Turmo-Garuz, Bartual-Figueras, & Sierra-Martinez, 2019). Numerous consequences have been identified in existing literature as a result of overeducation. Overeducated individuals have reported low job satisfaction (Fleming & Kler, 2008; Mateos-Romero & del Mar Salinas-Jiménez, 2018; Sam, 2019), low productivity (Büchel, 2002; Kampelmann & Rycx, 2012; Quinn & Rubb, 2006; Tsang, 1984), and encountered wage penalties (Caroleo & Pastore, 2018; Datta & Mishra, 2019; Duncan & Hoffman, 1981).

Theoretical perspectives have attempted to justify the occurrence of overeducation, mostly framed within the existing views of the labour market (McGuinness, 2006). These perspectives have traditionally been classified into two groups dependent on the duration

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of overeducation (Capsada-Munsech, 2017): those who disregard it as a short-term phenomenon, resulting from labour market disequilibria, such as human capital theory (Becker, 1964) and career mobility theory (Sicherman & Galor, 1990), and those who realise that it may become a more persistent situation such as job competition theory (Thurow, 1975) and assignment theory (Sattinger, 1993).

However, a unique justification has been provided by (Collins, 1979) who disregards educational credentials as the 'currency for employment', whereby students pursue education to 'purchase' more desirable occupations (Collins, 1979, p. 183). In this sense, overeducation is the inflation of credentials, meaning that educational requirements for a job are not rooted in increased technical needs, but instead in the fact that socialisation into the dominantly higher educated culture has become a hiring criterion (Burriss, 1983). Employers often promote applicants with greater levels of education to higher-paying positions not because they are inherently more qualified but because of the credentials they have earned. Collins (1979) asserts that as long as employers continue to assign high-level employment to more educated people, there will be increasing pressure on the education system to produce credentials, regardless of the skills required by the labour market, resulting in qualification inflation and, consequently, overeducation.

In most Arab countries, credentialism is rooted in the traditional role of government in providing public sector jobs. This emphasis has been allocated to credentials as criteria for hiring rather than skills, which has encouraged people to pursue credentials because public sector jobs are guaranteed for anyone who holds an educational degree, leading to an overstaffed, inefficient public sector (R. Assaad, Krafft, & Salehi-Isfahani, 2018; Salehi-Isfahani, 2012).

In general, the analysis of overeducation has been focused on developed countries, in which the standards of education and technological advancement are high. Little effort has been devoted to studying the populations of developing countries (Mehta, Felipe, Quising, & Camingue, 2011; Sam, 2018), particularly in Arab labour markets. Therefore, the contribution of this study is threefold:

- 1) This research examines the incidence of overeducation across a sample of Arab countries, one of the least studied populations;
- 2) The panel data used in this study allows an examination of overeducation over time, providing a clear picture of its trend; and
- 3) The study measures overeducation using the three measurements used in the literature, demonstrating the different outcomes across the measurements and the overlap between them.

The study contains the following sections: Section 2 presents the measurements of overeducation, section 3 provides empirical evidence of overeducation in Arab countries, Section 4 presents data and methods, Section 5 provides the results, and section 6 discusses the main findings and concludes the study.

## **2. Measurements of Overeducation**

Since the introduction of the topic of overeducation, there has been a methodological debate on the most accurate measurement method. This debate has concluded that there is no preferred method to measure it as it entirely depends on data

availability (McGuinness, 2006). A number of meta-analysis studies have confirmed that the various approaches to estimating the incidence of overeducation have tended to yield broadly conflicting conclusions (Capsada-Munsech, 2019; McGuinness, 2006; McGuinness, Pouliakas, & Redmond, 2017; Verhaest & Omeij, 2006). More specifically, the different measures have tended to identify different people as overeducated. For example, using data from the REFLEX survey in 2005 (Barone & Ortiz, 2011) (Barone & Ortiz, 2011) employed both the subjective worker self-assessment approach and realized matches approach to assess overeducation in 15 European countries. The study found that the two indicators disagreed and that realized matches yielded a lower estimate than the subjective worker self-assessment approach.

However, due to limitations in data availability, credentials have been used for the past three decades of academic research as a valid measure to identify overeducated workers (Capsada-Munsech, 2019). Expanding upon the classifications provided in prior assessments of the literature on overeducation (Halaby, 1994; McGuinness, 2006; Verhaest & Omeij, 2006), the most prevalent overeducation measures fall into three categories: (1) Workers' self-Assessment (WA), (2) Job Analyst (JA), and (3) Realized Matches (RM) which are presented and discussed in the following section. While the first type of measurement is usually referred to as the subjective approach, the final two indicators are commonly described as the objective approach (Capsada-Munsech, 2019). Each of these methods has advantages and disadvantages (Capsada-Munsech, 2019). However, the selection of each method entirely relies on data availability:

- 1) WA is the subjective measure of overeducation proposed by (Duncan & Hoffman, 1981). This method involves using an individual's perspective to determine if their educational background matches job requirements. The perspective may be directly questioned if workers believe that they are overeducated or indirectly addressed by asking workers about the required level of education to perform their jobs (Halaby, 1994).
- 2) JA is a normative approach introduced by (Eckaus, 1964), based on pre-assumed correspondence between education and jobs established by job experts. As a result, according to the categorization system developed by experts in the field, a worker is considered to be overeducated if their degree of education is higher than the level that experts have determined is essential to successfully carry out the duties of the position.
- 3) RM (Verdugo & Verdugo, 1989), classifies workers as overeducated if their education level is more than one standard deviation over mean years of schooling for their occupation. This indicator's primary assumption is that there is a core of matched individuals in each occupation, and overeducated workers are evaluated based on this benchmark.

### 3. Overeducation in Arab countries; Empirical Evidence

Although the subject of overeducation has been well recognised and explored in the context of developed nations, the Arab countries provide an interesting case. There are significant institutional differences between developed and developing economies. Rigidities in labour markets as well as public employment policies are likely to segment the labour market, especially among educated people. A large proportion of youth are unemployed, and a significant share of them are employed in the unregulated unprotected

informal sector (Assaad, 2014; Herrera-Idárraga, López-Bazo, & Motellón, 2012). It is possible that these rigidities and policies might also affect the way workers match their education with the requirements to perform their jobs.

In Arab countries, employment in the public sector is the preferred destination of the majority of educated workers (Assaad, 2014; Assaad, AlSharawy, & Salemi, 2019). The public sector's emphasis on credentials rather than skills encouraged people to compete for desirable government jobs by acquiring higher levels of education, believing this would enable them to ascend the employment ladder. This situation has been exacerbated by decreasing job opportunities in the public sector and weak growth in the private sector, which has created an oversupply of educated people, who pursued further education in the hope of signaling their abilities and obtaining elite government jobs.

The dramatic decline in public sector hiring of educated individuals has not been compensated for by a corresponding growth in formal private-sector employment opportunities, leading to youth unemployment and non-participation among educated Arab people (Assaad et al., 2016). This study argues that this situation has led to a significant imbalance in the labour market, where overeducation is expected to be considerably higher in the private sector relative to the public sector among the majority of occupations.

Few studies have empirically examined the phenomenon of overeducation among Arab nations. Using the Egyptian labour market panel survey in 2006 and 1998, (El-Hamidi, 2010) measured the incidence of overeducation in Egypt in the private sector only using the RM approach and witnessed that the male overeducation rate in the private sector had fallen from 43% to 11%, while, for women, it had fallen from 29% to 17%. In a report titled *Labour Market Transitions of Young Women and Men in Egypt* (Barsoum, Ramadan, & Mostafa, 2014), overeducation was measured using the JA approach and found that approximately 9% of workers are overeducated in Egypt, using the Egyptian labour force survey in 2012. Another study by (David & Nordman, 2017), using data from a survey conducted as part of the European Training Foundation's (ETF) *Migration and Skill* project, examined the incidence of overeducation among non-migrants and return migrants in Egypt and Tunisia using the RM approach. The overall overeducation rate in Egypt was 11.4%, with returnees having a rate of 10.7%. In Tunisia, the overeducation was slightly higher, at 12.2%.

A recent study by (Morsy & Mukasa, 2019) focuses on African youth, has estimated the effect of educational mismatch on wages and job satisfaction, using school-to-work transition survey, and the JA approach to measuring overeducation. In this study, Egypt was one of the countries in the sample that has been found to have a considerable incidence of overeducation and one of the largest gender gaps among the studied countries, in which women are 2.9% more likely to be overeducated than men, and overeducation harms job satisfaction. On the contrary, (Krafft, Branson, & Flak, 2019), using labour market surveys from Egypt (2012) and Tunisia (2014), have found that males are more overeducated than females; 52% of males in Egypt and 46% in Tunisia are overeducated, while 17% of females in Egypt and 31% in Tunisia are overeducated, using the WA approach. Apparently, different datasets utilised in both studies and different measurements of overeducation justify the contradictory results.

The preceding discussion demonstrated that limited efforts have been undertaken to investigate the prevalence of overeducation in Arab nations. The majority of these studies have relied on cross-sectional data and are nearly obsolete. In addition, none of these studies have examined the incidence of overeducation using a variety of methodologies described in the literature. Therefore, the contribution of this study is the availability of contemporary estimates of overeducation in Arab nations, as well as evidence of overeducation using the three measures used in the literature, allowing for the observation of the different results produced using various measures.

#### 4. Data and Methods

The study utilises the recently published Integrated Labour Market Panel Surveys (ILMPS). The ILMPS is a dataset that harmonized and integrated the data and variables from four rounds of the Egyptian Labour Market Panel Survey (ELMPS) for the years 1998, 2006, 2012, and 2018; two rounds of the Jordanian Labour Market Panel Survey (JLMPS) for the years 2010 and 2016; and the Tunisia Labour Market Panel Survey (TLMPS) for the year 2014 (OAMDI, 2019). This integrated survey was conducted by the Economic Research Forum (ERF), in cooperation with the Central Agency for Public Mobilization and Statistics (CAPMAS). It comprises compatible variables, which were harmonized as far as possible across all rounds, in order to produce comparable data that facilitates comparative analysis across countries.

##### 4.1 Measuring Overeducation

One of the advantages of the ILMPS is that it allows the measurement of overeducation via three types of measurements used by the literature, namely subjective, objective and empirical.

**First, WA approach.** In the ILMPS, workers were asked the following questions:

Q: What is your level of education?

Q: What is the level of education required for your job?

The answers to the first question included (1) illiterate, (2) read and write, (3) basic education, (4) secondary education, (5) post-secondary, (6) university, (7) postgraduate. Meanwhile, the answers for the second question were (1) no formal schooling, (2) literacy certificate, (3) primary, (4) preparatory, (5) secondary, (6) bachelor's degree, (7) postgraduate degree, and (8) do not know.

Accordingly, overeducated workers are defined as a worker whose acquired level of education is greater than the minimum required for their job. This measure is classified in the literature as indirect-self/worker assessment since workers are not directly asked if they consider themselves as overeducated or not. Unfortunately, this question does not exist in the survey data.

**Second, JA approach.** The ILMPS classification of occupation followed the ISCO-08, published by the International Labour Office (ISCO-08, 2008). The ISCO provides an objective measure of education, based on the International Standard Classification of Education (ISCED, 2011), which is “the reference classification for organising educational programmes and related qualifications by education level” (ISCED, 2011, p.9). Therefore,

overeducated workers are those whose level of education exceeds the level of education required by their occupation, based on the standards of ISCO.

**Third, RM approach.** The ILMPS includes a variable that inquires about the number of years spent in education. Therefore, the mean number of years of schooling in each occupation was computed, and every worker who deviates from that mean by at least one standard deviation is deemed overeducated.

## 5. Results

### 5.1 Sample Descriptive

The ILMPS provides a representative sample of the three countries, comprised of an equal number of males (50%) and females (50%). The sample includes a considerable share of waged workers classified according to the International Standard Classification of Occupation ISCO-88 (1988) (Table 1). In the sample, all age groups from 0 to 60+ were represented. However, for the sake of this study, only employed individuals in the age group 20–60 years will be included.

The descriptive statistics reveal that in the three countries, males are more prevalent than females due to their over-representativeness in the labour market, with males comprising approximately 80% of the working force in Egypt, 82% in Jordan and 75% in Tunisia. The majority of the sample is married employees. In Egypt and Jordan, the highest age groups in the working force are those aged 25-29 and 30-34. However, in Tunisia, the ages of 35-39 and 40-44 are the highest.

Regarding the educational level of the working force, the secondary level of education is the highest attained level in Egypt, with 35% of the working population having secondary education. In Jordan and Tunisia, however, basic educational level (primary education) is the highest percentage with 32% and 38%, respectively. It is striking to observe a large percentage of the illiterate working population in Egypt, which constitutes around 19% of the working force. This could be due to the prevalence of agricultural activity in the country, as evidenced by the fact that 18 % of the working population is employed in the agricultural sector. Agricultural workers are normally from rural areas and inherit the required job skills from their parents; yet, their labour in agriculture hinders their educational advancement, which is a global concern (Hurst, Termine, & Karl, 2005). University holders constitute a reasonable sample of the working population in Egypt and Jordan but not in Tunisia. Almost 20% of the working population holds university degrees in Egypt and Jordan, which facilitates the analysis of the overeducation phenomenon in the current study.

Medium-skilled jobs dominate the occupational classifications of the sample throughout the three nations, given the prevalence of associated educational levels (ISCO-08, 2008). Agriculture is the highest occupational classification in Egypt, with 18%, followed by the craft and related trades with, 17%. Regarding the high-skilled occupations, professional occupations were the highest, almost 16% of the working population. In Jordan, the highest occupational classification is also medium-skill occupations, service and sales workers, with almost 29%, followed by professionals (high-skilled jobs) with 21%. In Tunisia, the highest occupational classifications were from medium to low-skilled jobs, with 22% in craft and related trades and elementary occupations. This is primarily due to the low level of education in the country.

**Table 1** Sample Descriptives of ELMPS, JLMPS and TLMPS

	Egypt n= 43,980 (1998-2012-2006-2018)		Jordan n=11,312 (2010-2016)		Tunisia n= 3442 (2014)	
<b>Gender</b>						
Male	35,102	79.81%	9,356	82.71%	2,552	75.32%
Female	8,878	20.19%	1,956	17.29%	836	24.68%
<b>Marital Status</b>						
Single	8,720	19.84%	3,383	29.91%	996	29.35%
Married	33,844	76.99%	7,755	68.56%	2,326	68.53%
Divorced	538	1.22%	132	1.17%	34	1.00%
Widowed	859	1.95%	42	0.37%	38	1.12%
<b>Age Group</b>						
20-24	5,044	11.47%	1,663	14.70%	292	8.48%
25-29	8,012	18.22%	2,316	20.47%	395	11.48%
30-34	7,730	17.58%	2,164	19.13%	475	13.80%
35-39	6,444	14.65%	1,775	15.69%	513	14.90%
40-44	5,196	11.81%	1,410	12.46%	504	14.64%
45-49	4,459	10.14%	1,019	9.01%	471	13.68%
50-54	3,818	8.68%	600	5.30%	443	12.87%
55-60	3277	7.45%	365	3.23%	349	10.14%
<b>Education Level</b>						
Illiterate	8,489	19.31%	420	3.71%	589	17.60%
Read & Write	2,651	6.03%	1,601	14.15%	689	20.59%
Basic Education	6,103	13.88%	3,678	32.51%	1,281	38.28%
Secondary Educ	15,516	35.29%	1,805	15.96%	428	12.79%
Post-Secondary	2,062	4.69%	1,195	10.56%	159	4.75%
University	8,664	19.71%	2,247	19.86%	171	5.11%
Post-Graduate	480	1.09%	366	3.24%	29	0.87%
<b>Occupational classification</b>						
Managers	3,448	7.95%	112	1.00%	59	1.87%
Professionals	6,873	15.85%	2,335	20.76%	232	7.34%
Technicians and associate professionals	3,482	8.03%	759	6.75%	126	3.98%
Clerical support workers	2,338	5.39%	898	7.98%	114	3.61%
Service and sales workers	6,421	14.80%	3,215	28.59%	570	18.03%

Skilled agricultural, forestry and fish	7,836	18.07%	315	2.80%	423	13.38%
Craft and related trades workers	7,531	17.36%	1,601	14.23%	704	22.26%
Plant and machine operators, and assembly	3,626	8.36%	1,185	10.54%	251	7.94%
Elementary occupations	1,818	4.19%	827	7.35%	683	21.60%

*Source:* Constructed by the author using the ILMPS, Egiy 2012 & 2018, Jor 2016, and Tun 2014

## 5.2 The Incidence of overeducation

### First: WA Approach

#### A. Overeducation by Gender

The findings reveal a considerable prevalence of overeducation in the three countries, almost half of the working population are overeducated. In Egypt, the incidence of overeducation climbed from 46 % in 2012 to over 51 % in 2018. In Jordan 2016, the incidence of overeducation was 46 %, whereas, in Tunisia, it was 49 %. Among the three countries, males are more overeducated than women. (Table 2) demonstrates the incidence of overeducation among the three countries using the subjective approach. Due to data availability, calculations were based on only data for 2012 and 2018 in Egypt and 2016 in Jordan.

**Table 2** Overeducation incidence for Egypt, Jordan and Tunisia by different years and sex, using the subjective approach

	2012			2014			2016			2018		
	Male	Female	Total									
<b>Egypt</b>	51.7	22.5	46.2							55.5	27.9	50.5
<b>Jordan</b>							49.2	27.3	46.2			
<b>Tunisia</b>				52.7	35.6	48.6						

*Source:* Constructed by the author using the ILMPS, Egiy 2012 & 2018, Jor 2016, and Tun 2014 (educational requirement variable, which required to calculate overeducation does not exist prior 2012 for Egypt, and prior 2014 for Jordan)

#### B. Overeducation by Occupational Classification

In Egypt, most notably, overeducation was raised from 2012 to 2018. Among the high-skilled occupations, managers have the highest incidence of overeducation with 45-46%. A very high incidence of overeducation can be found in medium-skilled jobs. Craft and related trades have the highest incidence of overeducation in both years, with 67-71% in total. In Jordan, among the high-skilled occupations, technicians were predominantly affected by overeducation, with a total of 29%. In the medium-skilled jobs, overeducation primarily affects people who work in craft and related trades workers and plant and machine, with 69%. Similarly, in Tunisia, technicians were predominantly affected by overeducation, among the high-skilled occupations, with a total of 17%. In the medium-skilled jobs, overeducation was the highest among plant and machine 61% and skilled agricultural with 57%. (Table, 1A) represents the incidence of overeducation by occupational classifications.

### C. Overeducation by Occupational Sector

Among the three countries, overeducation predominantly affects workers in the private sector (Table 2A).

### D. Overeducation by Educational level

Interestingly, the results in (Table 3A) reveal that workers with moderate levels of education are more likely to be overeducated than those with higher degrees across the three countries. However, since overeducation has been perceived in the literature as a human capital accumulation, in which people acquire too much education that exceeds the required in the labour market, this study will accordingly be focusing on observing overeducation among higher levels of education, i.e. secondary education and above. Across the three countries, post-graduate degrees have the highest overeducation incidence, while university degrees have the lowest incidence.

#### Limitations of the Subjective Measure

In the subjective approach, it is observed that the level of education required for the job is subjectively answered. People have a tendency to overestimate their skills and certifications. They are hesitant to admit that they are underqualified for their positions, which creates a response bias. Indeed, this issue is a well-documented drawback for the subjective approach in the literature (McGuinness, 2006; McGuinness, Pouliakas, & Redmond, 2018). For example, in (Table 3), 96% of Skilled agricultural, forestry and fishery workers think that no formal education is required for their jobs, although the ISCO 88 classifications classify workers as undereducated in skilled agriculture if their level of education is less than the secondary level of education

**Table 3** Level of Education Required for Skilled agriculture and Fishery Workers

Level of education required for job (3-month ref.)	Freq	Percent
<i>Occupation = Skilled agricultural, forestry and fishery workers</i>		
No formal schooling	5,666	96.31
Literacy certificate	85	1.44
Primary	31	0.53
Preparatory	17	0.29
Secondary	67	1.14
University	15	0.25
Graduate	2	0.03
<b>Total</b>	<b>5,883</b>	<b>100.00</b>

*Source: Constructed by the author using the ELMPS of 1998, 2006, 2012 and 2018*

### Second: JA approach

In contrast to the WA approach, the JA provides an estimate of overeducation for each year in the dataset. This is because all survey rounds of the ILMPS contain the variables required for this measurement. Measuring overeducation by the objective approach produced a completely different incidence. While overeducation was high using the subjective method, it appeared low using the objective approach. The justification behind these variations is that the objective measure provides a precise assessment of the educational level necessary to perform the task and duties of a particular job, relying on

standard international classifications of occupations such as ISCO-88 (Hartog, 2000). On the contrary, the degree of education necessary for the job is a self-assessment tool in the subjective approach, in which employees themselves answer this question by assessing their qualifications and the requirements for the job. Therefore, the questions are more likely to be subjectively answered.

**A. Overeducation by Gender**

Overeducation moderately affects workers in the three countries (Table 4). In Egypt, overeducation increased from 6% in 1998 to 11% in 2018 and is more likely to affect males than females. The results are comparable to those published by the International Labour Office, using a cross-sectional ‘school-to-work transition survey’, in 2012 (Barsoum et al., 2014) and another recent study that used the same dataset and measured overeducation among 10 African countries, including Egypt (Morsy & Mukasa, 2020). Both studies measured the incidence of overeducation in 2012 only; however, the current study was able to measure it across the time, which helps to observe the overall trend. In Jordan, overeducation decreased from 11% in 2010 to 8% in 2016. This is more likely due to the decrease in educational attainment among medium-skilled jobs, as evidenced in the descriptive statistics section. Overeducation was higher among females in 2010, but comparable to males in 2016. In Tunisia, the overall overeducation was around 8% in 2014, with females having a higher incidence of overeducation than males.

**Table 4** Overeducation incidence for Egypt, Jordan and Tunisia by different years and sex, using the objective JA approach

Egypt	(1998)			(2006)			(2012)			(2018)		
	Male	Female	Total									
	6	6	6	8	5	7	11	6	10	11	9	11
Jordan	(2010)			(2016)								
	Male	Female	Total	Male	Female	Total						
	11	12.5	11	8	8	8						
Tunisia	(2014)											
	Male	Female	Total									
	7	9	8									

**B. Overeducation by Occupational Classification**

According to the objective JA measure, it is relatively difficult to observe overeducation among managers and professionals as these occupations require university degrees or above to perform. Over the years, overeducation increased in Egypt among all occupational categories (Table 8A ). On the contrary, overeducation decreased in Jordan from 2010 to 2016, while modest in Tunisia in 2014. Clerical occupations were the most affected by overeducation among the three countries, with females being overeducated more than their male counterparts.

### **C. Overeducation by Occupational Sector**

Similar to the subjective WA approach findings, overeducation by the objective approach was also higher in the private sector compared to the public sector among the majority of occupational groups in the three countries (Table 3A). In most Arab countries, the dramatic decline in public sector hiring of educated individuals has not been compensated by a corresponding growth in formal private sector employment opportunities, leading to youth unemployment and non-participation among Arab educated people (R. Assaad, Hendy, Lassasi, & Yassine, 2016). This study would argue that this situation has also led to a significant mismatch in the labour market, where overeducation is considerably higher in the private sector relative to the public sector among the majority of occupations.

### **D. Overeducation by Educational level**

The results reveal that overeducation is predominantly prevalent among post-secondary and university degree holders in the three countries (table 4A). In Egypt, overeducation sharply increased over the years among post-secondary (34% in 1998 to 55% in 2018) and university degree holders (15% in 1998 to 40% in 2018). Similarly, in Jordan and Tunisia, overeducation among post-secondary and university holders was the highest. However, in Jordan, the incidence of overeducation decreased from 2010 to 2016. In all three countries, overeducation was higher among males than females, despite rapidly increasing female educational attainment and the narrowing, if not reversal, of the gender gap in education (R. Assaad, R. Hendy, M. Lassasi, & S. Yassin, 2018). However, researchers argue that the decline in the probability of public sector employment for educated women is associated with either an increase in unemployment or a decline in participation (R. Assaad, Krafft, & Keo, 2019). Therefore, women are underrepresented in these markets.

### **Third: RM approach**

Unlike the subjective WA measure of overeducation, which was primarily affected by workers' response bias, or the JA method, which was initially designed on international standards of developed countries, the RM approach produces a more reflective approach. This approach assesses the average number of years of education in each occupational category and classifies as overeducated any worker with a standard deviation over the mean. This method takes into account the actual number of years of schooling and, thus, the required level of skills needed for each occupation, which may differ from those required in developed nations due to changes in technology and knowledge-intensive occupations. Another feature of this method is that it reflects the prevalence of credentials in the labour markets (McGuinness et al., 2018), which this study seeks to observe.

### **A. Overeducation by Gender**

The RM approach produces a relatively higher incidence of overeducation compared to the JA approach (Table 5). In Egypt, the total incidence of overeducation was high in 1998, which may have been influenced by the small sample size and a relatively large proportion of illiterate workers, reducing the overall mean years of schooling this year. In 2006, overeducation was 14%, then, slightly increased to 15% in 2012, most likely due to the social unrest and protests that occurred in this year, then decreased to 10% in 2018. In all the years, overeducation was higher among males than females.

In Jordan, overeducation slightly increased from 10% in 2010 (with comparable rates between males and females) to 11% in 2018. However, in 2016 females were predominantly more overeducated than males. This is attributable to the higher education level of female workers over time. In 2010, 38 % of female workers held university degrees, compared to 13.6% of male workers. In 2016, 46 % of women had a university degree, compared to 15 % of men. In Tunisia, overeducation was the highest compared to other countries, at 17% in 2014, probably due to the small sample size of employed people in the sample.

**Table 5 Overeducation incidence for Egypt (1998-2018), Jordan (2010-2016) and Tunisia (2014), by different years and sex, using the objective RM approach**

Egypt	(1998)			(2006)			(2012)			(2018)		
	Male	Female	Total									
	18	9	16	15.5	8.6	14	16	11.5	15	11	7	10
Jordan	(2010)			(2016)								
	Male	Female	Total	Male	Female	Total						
	10	10	10	10	14	11						
Tunisia	(2014)											
	Male	Female	Total									
	18	14	17									

**Source:** Constructed by the author using the ILMPS, *Egy 2012 & 2018, Jor 2016, and Tun 2014*

## B. Overeducation by Occupational Groups

The results in this section were interesting. The RM approach clearly represents the effect of the business cycle and political unrest in Egypt (Table 7A). In 2012, the year following the Egyptian uprising and Arab Spring of 2011, the majority of high- and medium-skilled occupations had a sharp increase in overeducation. Moreover, overeducation in Egypt among the majority of occupations was increasing over the years until it reached its peak in 2012, then decreased in 2018.

In Jordan, from 2012 to 2016, overeducation increased among high-skilled jobs, namely managers and professionals, but decreased among the medium-skilled jobs. In Tunisia, overeducation seems to have a higher incidence than in Egypt and Jordan. However, the sample size was small (only 571 out of 3,320 were overeducated), which affected the overall results.

## C. Overeducation by sector

Contrary to the results in the other measurements, overeducation by the RM approach was higher among high-skilled occupations in the public sector compared to the private sector (Table 8A). Overeducation was higher in the public sector among skilled agricultural workers as well as craft and related workers in all three countries. This is mainly due to the weak representation of the public sector in these activities compared to the private sector. The number of public sector workers in these occupations is relatively small, which affects the overall incidence of overeducation.

## D. Overeducation by educational level

In all three countries, overeducation primarily affects people with university and post-graduate degrees and predominantly affects males more than females (Table 9A).

### 5.3 Correlation between overeducation measurements

The results of this study are comparable to the findings in the literature. The Spearman rank correlation between the measurements was relatively low (Table 6). In all three countries, the correlation between JA and RM was stronger than between each of these methods and WA (i.e. between JA and WA and between RM and WA). In Egypt, the correlation between JA and RM increased over time, from a relatively weak correlation of 43% in 1998, to a moderate correlation of 60% in 2018. When observing the overeducation incidence across both measures, it can be seen that the estimates become increasingly comparable over time. For example, the overall overeducation incidence as measured by JA in 1998 was 6%, while it was 16% when measured using the RM approach in the same year. However, in 2018, the incidence was comparable between JA and RM, at 11% and 10%, respectively. The similarity between the two measures may imply that the Egyptian labour market become increasingly adjusted to international labour standards. This is reflected in the observation that, over time, the mean years of schooling in each occupation (RM) approaches the international occupational standards established by JA. Similarly, in Jordan, the correlation between RM and JA was moderate, ranging from 62% to 70%. The correlation also increased between 2010 and 2016. However, the correlation between both measurements and WA was weak. In Tunisia, the results indicate a weak correlation between the different measurements.

**Table 6.** Spearman rank correlation between different measures

<b>Egypt 1998</b>	<b>WA</b>	<b>JA</b>	<b>RM</b>
JA	--	1.0000	
RM	--	0.4286	1.0000
<b>Egypt 2006</b>		<b>JA</b>	<b>RM</b>
JA	--	1.0000	
RM	--	0.5096	1.0000
<b>Egypt 2012</b>	<b>WA</b>	<b>JA</b>	<b>RM</b>
WA	1.0000		
JA	0.1163	1.0000	
RM	0.2271	0.5421	1.0000
<b>Egypt 2018</b>	<b>WA</b>	<b>JA</b>	<b>RM</b>
WA	1.0000		
JA	0.0889	1.0000	
RM	0.1493	0.5997	1.0000
<b>Jordan 2010</b>	<b>JA</b>	<b>RM</b>	
JA	1.0000		
RM	0.6212	1.0000	
<b>Jordan 2016</b>	<b>WA</b>	<b>JA</b>	<b>RM</b>
WA	1.0000		
JA	0.0891	1.0000	
RM	0.1079	0.6986	1.0000

Tunisia 2014	WA	JA	RM
WA	1.0000		
JA	0.1209	1.0000	
RM	0.1420	0.4198	1.0000

*Source:* Constructed by the author using the ILMPS, Egy 2012 & 2018, Jor 2016, and Tun 2014

## 6. Discussion and Conclusion

### 6.1 Different measures, different outcomes

As mentioned previously, the dataset in this study allows for different overeducation measures. Therefore, measuring overeducation using the three methods in the literature and observing the findings was a worthwhile endeavour. The results revealed that the incidence of overeducation substantially varies across the measures. The subjective WA approach yielded the highest incidence of overeducation among the measures, ranging from 46% to 50% in the three countries. The JA approach produced the lowest incidence, between 6% to 11%, and the RM approach, fell in a middle ground between the two other approaches, although closer to JA at between 16% and 17% in all three countries. This is consistent with the findings in the literature: that different overeducation measures yield different outcomes (Capsada-Munsech, 2019).

A number of meta-analysis studies have confirmed that the various approaches to estimating the incidence of overeducation tend to yield broadly conflicting conclusions (Capsada-Munsech, 2019; McGuinness, 2006; McGuinness et al., 2017; Verhaest & Omev, 2006). More specifically, the different measures tend to identify different people as being overeducated. For example, using data from the REFLEX survey in 2005, (Barone & Ortiz, 2011) employed both the subjective WA approach and the RM approach to assess overeducation in 15 European countries. The study found that the two indicators disagreed: the RM yielded a lower estimate than the subjective WA approach.

Similarly, conflicting conclusions have been found by the European Commission (Kiss & Vandeplas, 2015) in a report that measured overeducation in a sample of EU countries using the JA and RM estimates. The report found that using different measures not only affected the level of overeducation, but the ranking of the countries also differed substantially. For instance, using the JA method, Spain showed the highest incidence of overeducation in the EU, whereas using the RM method, it had the third-lowest incidence of overeducation. The report found a weak correlation between the two measurements, concluding that caution is needed when interpreting the indicators.

In the literature, the subjective WA approach often yields the highest incidence of overeducation due to workers' willingness to exaggerate their qualifications, while the RM approach produces the lowest estimates of overeducation. However, in the current study, the JA approach produced the lowest estimates of overeducation. This is mainly because this approach relies on a correspondence between the required level of education and the required skills in each occupation based on an evaluation by professional job analysts. These evaluations were primarily conducted among industrial nations, where the level of technology and education is far higher than in developing countries. This method assumes that all occupations with the same title require the same level of education, which may not always be the case in reality and across nations. For example, the international classification of occupations mandates a minimum of lower secondary education to perform agricultural

jobs. However, in the majority of Arab nations, agricultural labourers are typically illiterate people who grew up on their families' farms and worked as farmers without attending school. Therefore, overeducation is uncommon in these occupations, though undereducation is prevalent.

This study found that the empirical RM method seems the most suitable approach. Although in the literature this method is considered a conservative indicator for measuring overeducation, its limitations serve the study's main purpose. As explained previously, this approach establishes that overeducated workers are those whose years of schooling exceed the mean education level of other employees in the same occupation by one standard deviation. This method focuses solely on the distribution of education within occupations. No consideration is given to their skill requirements, only formal education is accounted for (Capsada-Munsech, 2019). Therefore, this approach is influenced by credential inflation (McGuinness et al., 2017), where employers may boost formal requirements for particular occupations as the number of graduates rises, even if lower qualifications would suffice for optimal performance. This, to a large extent, describes the situation in the majority of Arab labour markets (El-Kogali & Krafft, 2019). The public sector's emphasis on credentials rather than skills encouraged people to compete for desirable government jobs by acquiring higher levels of education, believing this would enable them to ascend the employment ladder. This situation has been exacerbated by decreasing job opportunities in the public sector and the weak growth in the private sector, which has created an oversupply of educated people, who pursued further education in the hope of obtaining elite government jobs. To address this situation, employers raised the minimum educational level required for employment; they now require a university degree or higher as a minimum level for employment, even for medium-skilled jobs (Amin et al., 2012).

This argument is supported by the RM measurement showing that overeducation mainly affects university degree and post-graduate degree holders as well as those in medium-skilled jobs. This is consistent with the hypothesis of the credential theory that credential inflation has changed the value of educational degrees (Collins, 2002). The theory contends that the existence of a relatively small number of elite employment opportunities, i.e. government jobs, influences the competitiveness of labour markets. To satisfy societal demand, education has expanded significantly, and the business sector has responded to the oversupply of educated people by selecting candidates with higher educational degrees, resulting in increased demand for education. As more degrees become available, not all graduates can be absorbed by labour markets, but demand for credentials promising access to privileged jobs continues, thus creating credential inflation.

The credential theory asserts that employers often promote applicants with greater levels of education to higher-paying positions not because they are inherently more qualified but because of the credentials they have earned. Collins (1979) contends that as long as employers continue to assign high-level employment to more educated people, there will be increasing pressure on the education system to produce credentials, regardless of the skills required by the labour market, resulting in qualification inflation and, consequently, overeducation. As such, educational credentials have become the 'currency for employment', whereby students pursue education to 'purchase' more desirable occupations (Collins, 1979, p. 183). Therefore, the use of the RM method in this study

would corroborate this theoretical argument, as overeducation reflects credential inflation, but not necessarily the skills associated with education.

Moreover, unlike other measurements, RM shows that overeducation is more prevalent among high-skilled occupations in the public sector compared to the private sector. These findings validate the arguments found in the literature on the Arab labour market (R. Assaad, 2014), in which the historical use of public sector employment as an instrument of political appeasement within the framework of ‘authoritarian bargain’ social contracts has resulted in major problems in Arab labour markets. The credential theory highlights the role of credentials in promoting political labour markets. In these markets, organisational structure and occupational income are distributed depending upon the political labour surrounding the work process (Collins, 1979, p. 50). Collins claimed that “education is an artificial device for monopolising access to lucrative occupations” (1979, p.9). In most Arabian labour markets, central governments play a key role in employment systems, controlling access to jobs and scaling salaries. This centralised state control has hampered potential growth in the private sector (Barsoum, 2015). The private sector sometimes operates as a disguised public sector – or simply as an extension of the state (Malik & Awadallah, 2013). As overeducation affects high-skilled public sector jobs and medium-skilled private sector jobs, it validates the deep segmentation in Arab labour markets between public and private sectors, and reinforces the critical role of governments in this division.

## **6.2 Comparison between measurements**

In the previous section, it was highlighted that using different overeducation measures yields different outcomes. In this section, these differences will be discussed in detail.

## **6.3 Gender differences in overeducation**

Using all measures, males were found to be more overeducated than females. This contradicts the theory of differential overqualification (Frank, 1978), which maintains that females are more affected by overeducation than males. The findings also conflict with what has been found for the vast majority of developed countries (McGuinness, Bergin & Whelan, 2018). This result distinguishes the current study from those undertaken among developed nations, thereby contributing to the literature on overeducation by providing important evidence from developing countries with considerably distinct economic characteristics.

Females in Arab labour markets are substantially less represented than males (Assaad, R. Hendy, M. Lassassi, & S. Yassin, 2018). The dataset of this study shows that males comprise approximately 80% of the working force in Egypt, 82% in Jordan, and 75% in Tunisia. Despite the well-known supply-side factors that hinder female labour force participation in Arab countries, such as conservative gender norms and excessive domestic employment burdens, (Assaad, Hendy, Lassassi, & Yassin, 2018) argue that demand-related factors also play a role. The most significant change on the demand side, shared by the majority of nations in the region, is the substantial reduction in public sector hiring. In Arab countries, the public sector has historically been the primary source of employment for educated people, particularly educated women. The considerable decline in the hiring

of educated women (and men) by the public sector has not been offset by an increase in formal private sector employment or non-wage work, leaving unemployment and non-participation as the only available options.

#### 6.4 Overeducation among different occupational classifications

The **WA approach** shows that overeducation mainly affects medium-skilled jobs such as crafts and related trades in Egypt (2012-2018) and Jordan (2016), but not in Tunisia, where plant and machine and skilled agricultural jobs were the most affected. Among the high-skilled occupations, managers have the highest incidence of overeducation in Egypt, while technicians were the most affected by overeducation in Jordan and Tunisia. Due to data availability, the subjective approach yielded limited results and it was thus challenging to observe the trend of overeducation over the years.

The **JA approach** showed that clerical occupations were the most affected by overeducation among the three countries, with females being more overeducated than their male counterparts. Clerical professions are considered a type of white-collar job involving managerial, desk, or administrative work. Therefore, it is likely that many of overeducated individuals are taking up these jobs as an alternative to unemployment when they are unable to find a more suitable role. Alternatively, overeducated workers may accept these jobs to gain experience, in the hope of moving to better job positions that match their qualifications, as suggested by career mobility theory. These professions also suit the norms and lifestyle of Arab women due to shorter working hours, child-care facilities, and office-based employment without the need to go outside or interact with men.

Regarding the trend of overeducation, this approach showed that, in Egypt, overeducation gradually increased from 1998 to 2018 among all occupations. However, its increase among technicians and associated professions was particularly significant, among both males and females but most notably among females (from 15% in 1998 to 28% in 2018). The dramatic increase in overeducation within this occupation points to the increase in higher educational levels (i.e. university degrees), especially among females, because these occupations require at least a short period of tertiary education. In other words, technicians and associated professions who are overeducated hold a university degree or higher (ISCO-08, 2008) – the oversupply of university graduates forces them to accept jobs below their level of education. Interestingly, in Jordan, overeducation declined from 2010 to 2016 among the majority of occupations, most likely due to the decrease in overall educational level among the population.

The **RM approach** yielded particularly interesting results, clearly representing the effect of the business cycle and regional political unrest. In Egypt in 2012, the year following the Egyptian uprising and Arab Spring of 2011, the majority of high- and medium-skilled occupations showed a sharp increase in overeducation. This is consistent with the findings of (Verhaest & Omev, 2006), who identified that the RM approach is more sensitive than other measures to the business cycle of the economy. Instability in the economy causes a considerable shift in the composition of new hires and substantially impacts the required degree of education. In this context, from a micro perspective, uncertainty and low future expectations force individuals to accept jobs at any cost in order to escape unemployment and maintain minimal pay.

In general, this approach shows that overeducation predominantly affects medium-skilled jobs such as technical clerical, service and trades, and agricultural roles, in all three countries. Moreover, overeducation in Egypt among the majority of occupations increased over time until reaching its peak in 2012, then decreasing in 2018. In Jordan, from 2012 to 2016, overeducation increased among high-skilled jobs, namely managers and professionals, but decreased among medium-skilled jobs. This is likely due to the trend of increasing educational level among managers and professionals, as presented in the descriptive statistics section. In Tunisia, there seems to be a higher incidence of overeducation than in Egypt and Jordan.

Similar to the findings of the JA approach, the RM approach showed that, in all three countries, overeducation predominantly affects women working in clerical jobs. Moreover, in Egypt in 2018, women were more overeducated than males in high-skilled jobs. This is primarily due to the increased levels of higher education among females and their increased participation in these occupations.

### **6.5 Overeducation in different occupational sectors**

The **WA** and the **JA** approaches both showed that overeducation predominantly affects people working in the private sector compared to the public sector, among the majority of occupational groups in the three countries. However, the **RM approach** provided quite different results. This approach found that, in all three countries, overeducation was high among high-skilled public sector occupations, compared to the private sector. This is likely due to the use of public sector jobs as a tool of political appeasement in the framework of ‘authoritarian bargain’ social contracts (Assaad, 2014a). Moreover, the occupational structure differs greatly between the public and private sectors, based on the size of the firms (Assaad, 2014b). Small private firms hire very few professionals and managers, showing that the labour demand structure in the private sector is still heavily skewed toward semi-skilled and unskilled employment. This was evident from the results of this study, in which overeducation was highly prevalent among medium-skilled jobs in the private sector.

In most Arab countries, the dramatic decline in public sector hiring of educated individuals has not been compensated for by a corresponding growth in formal private sector employment opportunities, leading to youth unemployment and non-participation among educated Arab people (R. Assaad et al., 2016). This study argues that this situation has led to a significant imbalance in the labour market, where overeducation is considerably higher in the private sector relative to the public sector among the majority of occupations.

### **6.6 Overeducation among different educational levels**

The three measures all concluded that overeducation predominantly affects people with higher educational degrees, which is consistent with the literature (Delaney, McGuinness, Pouliakas, & Redmond, 2020). According to the **WA approach**, individuals with post-graduate degrees have the highest incidence of overeducation among the three countries. In Egypt, overeducation among all educational levels increased from 2012 to 2018, which may reflect the expansion in education due to increased demand for credentials in the region. As highlighted by (R. Assaad, C. Krafft, et al., 2018), an increase

in the supply of educated people motivates employers to raise their requirements for higher educational degrees.

The results from the **JA approach** revealed that overeducation is predominant among post-secondary and university degree holders in all three countries. In Egypt, overeducation sharply increased from 2012 to 2018 among post-secondary and university degree holders. Similarly, in Jordan and Tunisia, overeducation was highest among post-secondary and university holders. However, in Jordan, the incidence of overeducation decreased from 2010 to 2016.

The **RM approach** demonstrated that, in all three countries, overeducation mostly affected people with university and post-graduate degrees, and affected males more than females. Regarding the trend of overeducation, Egypt showed fluctuations in the overeducation incidence across the year. However, the general trend showed that overeducation was increasing over time, until reaching a peak in 2012 and then decreasing. In Jordan, from 2010 to 2016, overeducation significantly increased among post-secondary education holders but fell among university degree holders and post-graduates.

Across the different measurements and in all three countries, overeducation was higher among males than females, despite rapidly increasing female educational attainment and the narrowing, if not reversal, of the gender gap in education (R. Assaad, R. Hendy, et al., 2018). However, researchers argue that the decline in the likelihood of obtaining public sector employment for educated women is associated with either an increase in unemployment or a decline in participation (R. Assaad et al., 2019). As a consequence, women are underrepresented in these markets.

The findings of this study are consistent with the literature, showing that overeducation particularly affects people with high educational degrees, i.e. those with university degrees and above. For example, evidence from the 25 European Labour Force Survey (2013) showed that the risk of overeducation among university graduates was higher than at other levels of education (Boll, Leppin, Rossen & Wolf, 2016). Moreover, using data from Swiss graduate surveys from 2002 to 2008, (Diem & Wolter, 2014) found that 15% of university graduates were in jobs that do not require university degrees, making poor to modest use of their skills and competence. In the United States, based on Bureau of Labour Statistics data for more than 700 occupations, during 2002–2016, (Habibi & Kamis, 2021) observed that master's degree holders were displacing bachelor's degree holders from higher-paying bachelor's degree employment. In turn, bachelor's degree holders were displacing secondary school graduates from higher-paying secondary school employment, which explains the high incidence of overeducation among these levels of education.

In sum, despite the different outcomes obtained from applying different measures, the results of this study provide empirical evidence of overeducation, an example of labour market distortion in Arab countries. It is crucial to emphasise that this study does not conclude that higher education is pointless; or that universities are selling people a nightmare rather than a future dream. People may consider a waiter in a restaurant who has a bachelor's degree as unfortunate. However, universities do not only teach knowledge of a particular discipline. They equip students with generic skills that are essential in any job and could serve as an entry ticket to the labour market. However, if educational expansion will eventually lead to high youth unemployment and overeducation, then policymakers should reconsider education curricula and academic specialisation, and how

the labour market functions in matching people to jobs. A lesson from Germany, establishing a strong apprenticeship system might be a solution to address the issue of overeducation.

## Appendices

Tables in appendices are available upon request from the author.

## References

- Amin, M., Assaad, R., Al-Baharna, N., Dervis, K., Desai, R. M., Dhillon, N. S., . . . Graham, C. (2012). *After the spring: Economic transitions in the Arab world*: OUP USA.
- Assaad. (2014). Making sense of Arab labor markets: the enduring legacy of dualism. *IZA Journal of Labor & Development*, 3(1), 1-25.
- Assaad, AlSharawy, & Salemi. (2019). *Is the Egyptian economy creating good jobs? Job creation and economic vulnerability from 1998 to 2018*. Paper presented at the Economic Research Forum Working Paper Series (Forthcoming).
- Assaad, Hendy, Lassassi, & Yassin. (2018). Explaining the MENA paradox: Rising educational attainment, yet stagnant female labor force participation.
- Assaad, Hendy, R., Lassassi, M., & Yassin, S. (2018). Explaining the MENA paradox: Rising educational attainment, yet stagnant female labor force participation.
- Assaad, R. (2014). Making sense of Arab labor markets: the enduring legacy of dualism. *IZA Journal of Labor & Development*, 3(1), 1-25.
- Assaad, R., Hendy, R., Lassasi, M., & Yassine, C. (2016). *Where has all the education gone? Analyzing trends in labor force participation in MENA*. Paper presented at the Economic Research Forum 22nd Annual Conference.
- Assaad, R., Hendy, R., Lassassi, M., & Yassin, S. (2018). Explaining the MENA paradox: Rising educational attainment, yet stagnant female labor force participation.
- Assaad, R., Krafft, C., & Keo, C. (2019). The Composition of Labor Supply. *The Jordanian Labor Market: Between Fragility and Resilience*, 11.
- Assaad, R., Krafft, C., & Salehi-Isfahani, D. (2018). Does the type of higher education affect labor market outcomes? Evidence from Egypt and Jordan. *Higher Education*, 75(6), 945-995.
- Barone, C., & Ortiz, L. (2011). Overeducation among European University Graduates: a comparative analysis of its incidence and the importance of higher education differentiation. *Higher Education*, 61(3), 325-337.
- Barsoum, G. (2015). Striving for job security: The lived experience of employment informality among educated youth in Egypt. *International Journal of Sociology and Social Policy*, 35(5/6), 340-358.
- Barsoum, G., Ramadan, M., & Mostafa, M. (2014). *Labour market transitions of young women and men in Egypt*: ILO.
- Becker, G. (1964). *Human Capital*. New York: Nat. Bur. Econ. Res.
- Büchel, F. (2002). The effects of overeducation on productivity in Germany—the firms' viewpoint. *Economics of Education Review*, 21(3), 263-275.
- Burris, V. (1983). The Social and Political Consequences of Overeducation. *American Sociological Review*, 48(4), 454-467. doi:10.2307/2117714
- Capsada-Munsech, Q. (2019). Measuring Overeducation: Incidence, Correlation and Overlaps Across Indicators and Countries. *Social Indicators Research*, 1-23.
- Capsada-Munsech, Q. (2017). Overeducation: Concept, theories, and empirical evidence. *Sociology Compass*, 11(10), e12518.
- 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.
- Collins, R. (1979). *The Credential society : an historical sociology of education and stratification*: New York (N.Y.) : Academic press.
- Collins, R. (2002). Credential inflation and the future of universities. *The future of the city of intellect: The changing American university*, 23-46.

- Datta, B., & Mishra, U. S. (2019). Effect of Education–Occupation Mismatch on Wages in India. *The Indian Journal of Labour Economics*, 1-23.
- David, A. M., & Nordman, C. J. (2017). Skill mismatch and migration in Egypt and Tunisia.
- Delaney, J., McGuinness, S., Pouliakas, K., & Redmond, P. (2020). Educational expansion and overeducation of young graduates: A comparative analysis of 30 European countries. *Oxford Review of Education*, 46(1), 10-29.
- Diem, A., & Wolter, S. C. (2014). Overeducation among Swiss university graduates: determinants and consequences. *Journal for Labour Market Research*, 47(4), 313-328.
- Duncan, G. J., & Hoffman, S. D. (1981). The incidence and wage effects of overeducation. *Economics of Education Review*, 1(1), 75-86.
- Eckaus. (1964). Economic Criteria for Education and Training. *The review of economics and statistics*, 46(2), 181-190. doi:10.2307/1928184
- El-Hamidi, F. (2010). Education-occupation mismatch and the effect on wages of Egyptian workers. *Handbook on international studies in education*, 123-138.
- El-Kogali, S. E. T., & Krafft, C. (2019). *Expectations and aspirations: A new framework for education in the Middle East and North Africa*. World Bank Publications.
- Fleming, C. M., & Kler, P. (2008). I'm too clever for this job: a bivariate probit analysis on overeducation and job satisfaction in Australia. *Applied Economics*, 40(9), 1123-1138.
- Freeman, R. (1976). The overeducated american.
- Habibi, N., & Kamis, A. (2021). Reaching for the stars and settling for the moon: recent trends in overeducation of US workers 2002-2016. *Journal of education and work*, 34(2), 143-157.
- Halaby, C. N. (1994). Overeducation and skill mismatch. *Sociology of Education*, 67(1), 47-59.
- Hartog, J. (2000). Over-education and earnings: where are we, where should we go? *Economics of Education Review*, 19(2), 131-147.
- Herrera-Idárraga, P., López-Bazo, E., & Motellón, E. (2012). Informality and overeducation in the labor market of a developing country. *XREAP2012-20*.
- Hurst, P., Termine, P., & Karl, M. (2005). Agricultural workers and their contribution to sustainable agriculture and rural development.
- ISCED. (2011). ISCED 2011 overview. <https://www.oecd-ilibrary.org/>.
- ISCO-08. (2008). SCL - International Standard Classification of Occupations 2008 (ISCO-08). Retrieved from [https://ec.europa.eu/eurostat/ramon/nomenclatures/index.cfm?TargetUrl=LST\\_NOM\\_DTL&StrNom=CL\\_ISCO08&StrLanguageCode=EN&IntPcKey=&StrLayoutCode=HIERARCHIC#:~:text=The%20framework%20used%20for%20the, and%20the%20concept%20of%20skill.&text=A%20person%20may%20be%20associated,or%20a%20job%20previously%20held](https://ec.europa.eu/eurostat/ramon/nomenclatures/index.cfm?TargetUrl=LST_NOM_DTL&StrNom=CL_ISCO08&StrLanguageCode=EN&IntPcKey=&StrLayoutCode=HIERARCHIC#:~:text=The%20framework%20used%20for%20the, and%20the%20concept%20of%20skill.&text=A%20person%20may%20be%20associated,or%20a%20job%20previously%20held)
- Kampelmann, S., & Rycx, F. (2012). The impact of educational mismatch on firm productivity: Evidence from linked panel data. *Economics of Education Review*, 31(6), 918-931.
- Kiss, A., & Vandeplas, A. (2015). Measuring skills mismatch. *DG EMPL Analytical webnote*, 7, 2015.
- Krafft, C., Branson, Z., & Flak, T. (2019). What's the value of a degree? Evidence from Egypt, Jordan and Tunisia. *Compare: A Journal of Comparative and International Education*, 1-20.
- Malik, A., & Awadallah, B. (2013). The economics of the Arab Spring. *World Development*, 45, 296-313.
- Mateos-Romero, L., & del Mar Salinas-Jiménez, M. (2018). Labor mismatches: Effects on wages and on job satisfaction in 17 OECD countries. *Social Indicators Research*, 140(1), 369-391.
- McGuinness, S. (2006). Overeducation in the labour market. *Journal of Economic Surveys*, 20(3), 387-418.
- McGuinness, S., Pouliakas, K., & Redmond, P. (2017). How useful is the concept of skills mismatch?
- McGuinness, S., Pouliakas, K., & Redmond, P. (2018). Skills mismatch: Concepts, measurement and policy approaches. *Journal of Economic Surveys*, 32(4), 985-1015.
- 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.
- Morsy, H., & Mukasa, A. (2019). Youth jobs, skill and educational mismatches in Africa.
- Morsy, H., & Mukasa, A. N. (2020). 'Mind the mismatch?' Incidence, drivers, and persistence of African youths' skill and educational mismatches. *African Development Review*, 32, S5-S19.
- OAMDI. (2019). Labor Market Panel Surveys (LMPS). *ILMPS. Egypt: Economic Research Forum (ERF), Version 4.0 of Licensed Data Files*.
- OECD. (2017). Education at a glance. Paris: OECD.

- 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.
- Salehi-Isfahani, D. (2012). Education, jobs, and equity in the Middle East and North Africa. *Comparative Economic Studies*, 54(4), 843-861.
- Sam, V. (2018). Overeducation among graduates in developing countries: What impact on economic growth? Sam, V. (2019). Impacts of educational mismatches on job satisfaction. *International Journal of Manpower*.
- Sattinger, M. (1993). Assignment models of the distribution of earnings. *Journal of economic literature*, 31(2), 831-880.
- Sicherman, N., & Galor, O. (1990). A theory of career mobility. *Journal of political economy*, 98(1), 169-192.
- Thurow, L. C. (1975). *Generating inequality*: Basic books.
- Tsang. (1984). *The impact of overeducation on productivity: a case study of skill underutilization of the US Bell companies*: Institute for Research on Educational Finance and Governance, School of ....
- Turmo-Garuz, J., Bartual-Figueras, M., & 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(3), 1273-1301.
- Verdugo, R. R., & Verdugo, N. T. (1989). The impact of surplus schooling on earnings: Some additional findings. *Journal of human resources*, 629-643.
- Verhaest, D., & Omey, E. (2006). The impact of overeducation and its measurement. *Social Indicators Research*, 77(3), 419-448.