Overeducated yet underskilled: graduate labour market mismatch in Morocco and Serbia

IVANA PRICA, Ph.D.*
IMANE EL OUIZGANI, Ph.D.*
WILL BARTLETT, Ph.D.*

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Ivana PRICA
University of Belgrade, Faculty of Economics and Business, Kamenička 6, 11000 Belgrade, Serbia
e-mail: ivanapopov.prica@gmail.com
ORCiD: 0000-0001-8980-5726

Imane EL OUIZGANI
Ibn Zohr University, Faculty of Economic Sciences, B.P 8658, 80000 Agadir, Morocco
e-mail: i.elouizgani@uiz.ac.ma
ORCiD: 0009-0008-5135-2635

Will BARTLETT
London School of Economics and Political Science (LSE), European Institute, Hellenic Observatory, Houghton street, London, WC2A 2AE, UK
e-mail: w.j.bartlett@lse.ac.uk
ORCiD: 0000-0002-6775-4339

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Abstract

This paper analyses the phenomenon of qualification and skill mismatch among university graduates in two countries in Morocco and Serbia. These countries are located within the super-periphery of the EU and face similar challenges in fostering competitive economies capable of trading with and receiving investment from their northern neighbours. Effective skill development and successful labour market matching of university graduates are crucial instruments to meet these challenges. We explore the different dimensions of this requirement based on an analysis of qualification and skill mismatch on the graduate labour market. Our survey reveals simultaneous overqualification and underskilling of university graduates, a high incidence of graduate mismatch combined with low-wage penalties in the public sector, high levels of mismatch and associated relatively high-wage penalties among women graduates, and an amelioration of skill mismatch over time due to on-the-job learning and job switching.

Keywords: qualification mismatch, skill mismatch, higher education systems, graduate labour markets, Morocco, Serbia

1 INTRODUCTION

North Africa and the Western Balkans are regions on the edge of the EU that face similar challenges in their economic development. As regions within the super-periphery of the EU economic space, they are heavily influenced by developments in the EU yet lack the same access to EU support in times of economic difficulty that is available to the EU member states of Southern and Eastern Europe (Bartlett and Prica, 2017).[1] As a result, their labour markets are more vulnerable to economic cycles and they suffer from higher unemployment rates and more precarious employment prospects for young people. They also suffer from large skill mismatches on the labour market with negative effects on productivity and prospects for innovation and economic growth. The low incidence of high-tech manufacturing sectors in GDP in the EU super-periphery has provided fertile conditions for graduate over-qualification to become an embedded feature of the higher education-labour market ecosystems, as argued also for the case of Southern Europe by Marques, Suleman and Costa (2022).

This paper investigates the extent, nature and causes of labour market mismatches in these EU-adjacent regions, with a focus on two country case studies: Morocco and Serbia. They have been selected as countries representative of the two regions due to their strong relationships with the EU.[2] Each country has robust economic linkages with the EU in terms of trade, investment flows and migration. For exam-

[1] In the EU, these sources of support include the EU Cohesion Funds, while the countries in the super-periphery rely on far more modest IPA III pre-accession assistance funds from the EU.

[2] In the case of Morocco, the EU-Morocco Association Agreement entered into force in 2000, and Morocco joined the EU European Neighbourhood Policy on 2003, culminating in a joint declaration for a Shared Prosperity Partnership in 2019. In the case of Serbia, a European Partnership was adopted in 2008, and Serbia signed a Stabilisation and Association Agreement with the EU in 2013 and accession negotiations were opened with Serbia in June 2013.

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ple, in the goods exports of Morocco 64% (European union, 2021) and of Serbia 66%[3] go to the EU. They have similar economic structures, with shares of industrial value added in GDP in 2023 of 24% in Morocco and 26% in Serbia,[4] and each has attracted foreign direct investment in the automotive components industry linking them into global value chains (Amachraa, 2024; Bartlett, Krasniqi and Ahmetbasić, 2019). Both countries also face substantial labour market challenges. In 2023, for example, the unemployment rate was 9.1% in Morocco and 8.7% in Serbia, while the youth unemployment rate is extremely high at 35.8% in Morocco[5] and 21.5% in Serbia.[6] They also differ in some socio-economic aspects that are important for this study. For example, GDP per capita is higher in Serbia than in Morocco (as is the average wage), while the 5.8% unemployment rate of those with advanced education is far lower in Serbia than the 25.9% in Morocco.

The surplus of unemployed graduates in Morocco suggests an oversupply of graduates on the labour market. Since employers are in an advantageous position on the labour market they can employ more highly educated/skilled workers for jobs that require a lower level of education/skills.[7] Therefore, a proportion of graduates may find themselves in jobs that require lower levels of qualification and skills than they attained at their university. The prevalence of such overeducation among university graduates is likely to be higher in Morocco than in Serbia (where the oversupply of graduates appears to be lower, judging by the lower level of graduate unemployment). At the same time, the higher education systems in the EU super-periphery score poorly on international rankings of universities world-wide due to the relatively low quality of the education that is offered.[8] This may give rise to the production of many graduates with levels of qualifications and skills that are below those required by the more advanced high-technology sections of the labour market and give rise to relatively high rates of underskilling of graduate employees. High levels of graduate qualification or skill mismatch on the labour market represent a misallocation of resources in the public education sector which may undermine the competitive potential of these economies.

This paper analyses graduate mismatch to identify the extent to which universities succeed in preparing students for their future careers in Morocco and Serbia. Our analysis compares, the extent of qualification mismatch on their labour markets, how these vary across the public/private sectors of activity and gender, and their

[3] https://neighbourhood-enlargement.ec.europa.eu/sites/default/files/2022-12/Serbia_12.22.jpg.
[4] These data and those in the rest of this paragraph are taken from the World Bank World Development Indicators online database.
[5] These data are from the High Commission for Planning of Morocco (HCP, 2023).
[6] Data are from the online database of the Statistical Office of the Republic of Serbia Q3 2024.
[7] This sometimes referred to as "bumping down" (Léné, 2011).
[8] According to the Times Higher Education Supplement, only one university in Morocco is ranked within the top 1,000 universities in the world (Mohammed VI Polytechnic University in Morocco), while Serbia has none ranked within the top 1,000 universities (Times Higher Education, 2025). In response to the perceived low quality of higher education in these EU-neighbouring regions, the European Commission has run two large assistance programmes – TEMPUS and ERASMUS MUNDUS – to support partnering and modernisation of the higher education systems in the region.

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consequences for the wage levels of university graduates.[9] It also compares the skill proficiencies attained at university in both countries and the level of skill mismatch involved. The next section (section 2) surveys the literature pertaining to the issue of qualification and skill mismatch, section 3 describes the survey instrument that was used to measure mismatch in the two countries, section 4 presents the survey findings on the extent of qualification mismatch and its consequences, while section 5 presents our findings on skills mismatch and its persistence over time. Section 6 presents our conclusions.

2 LITERATURE REVIEW

Qualification mismatch refers to the extent to which the qualification level achieved by a graduate is appropriate to the qualification required by a job.[10] Similar to qualification mismatch, skill mismatch is defined as the difference between the actual skill proficiency of an employee and the skill requirement of the job. Key concerns that have been raised in the literature revolve around the gender bias in graduate employment leading to a higher degree of female graduate mismatch, the persistence of graduate mismatch pointing to inefficiencies in labour allocation on the job market and the scarring effects of initial job mismatch, and the impact of mismatch on graduate earnings, pointing further to inefficiencies in labour market allocation as well as in higher education responsiveness to labour market changes. To this catalogue of woes, we add the differences in experience of mismatch for graduates who find jobs in the public sector rather than the private sector and differences in the demographic position of countries with some experiencing a graduate labour surplus and others experiencing a graduate labour shortage.

2.1 GRADUATE OVEREDUCATION AND THE ROLE OF EDUCATIONAL EXPANSION

The massive expansion in higher education in recent decades, stimulated by high expectations about its private and social benefits, has nevertheless led to concerns about the employability of recent graduates and the mismatches between their skills and the competences required by the labour market (Figueiredo et al., 2017; Osseiran, 2020; Green and Henseke, 2021). Several studies have found that cross-country differences in overeducation have resulted from variations in the oversupply of highly skilled labour (Verhaest aand Van der Velden, 2013). In the Western Balkans, in the 2000s there was a huge increase in enrolment in tertiary education that resulted in a substantial degree of overeducation throughout the region (Bartlett and Uvalić, 2019). Since then, enrolment levels have stabilised, large inflows of foreign direct investment have boosted economic growth which, together with substantial out-migration, have sharply reduced the levels of graduate unemploy-

[9] We identify several dimensions of HE graduates' skills and competencies: written communication, spoken communication, numerical analysis skills, foreign language skills, research skills, problem-solving skills, entrepreneurial skills, ability to manage time effectively, ability to work in teams, ability to work individually, digital skills, leadership skills, conflict management skills, and course-specific subject skills.

[10] Empirical studies have measured the extent of qualification mismatch (overeducation) in many countries (McGuiness, 2006; Chevalier and Lindley, 2009; Turmo-Garuz, Bartual-Figueras and Sierra-Martinez, 2019; Delaney et al., 2020; Chuang and Liang, 2022; Castro et al., 2023; Vecchia et al., 2023).

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ment. Hence the enabling conditions for graduate overeducation have changed dramatically. In contrast, in Morocco, high levels of tertiary enrolment have led to continuing oversupply of graduates on the labour market. In such conditions one may expect a relatively high level of graduate overeducation. More generally in the EU, recent research has failed to find a link between educational expansion and overeducation (Delaney et al., 2020). We argue, however, that this relationship does characterise less developed countries and especially countries in the EU super-periphery, notably in the Western Balkans, where high levels of overeducation have been found to be linked to rapid expansion of tertiary level provision (Bartlett et al., 2016; Bartlett and Uvalić, 2019).

At the same time, some countries in the super-periphery of the EU are experiencing the simultaneous problem of undereducation. According to our interviews with the Chamber of Commerce and Industry in Morocco, technical courses are taught by theoretical instructors who are far removed from the realities of the field and so graduates usually need to undergo additional professional training to become employable. In Morocco, Draissi and Rong (2023) found that two fifths of their urban employee survey respondents considered themselves to be undereducated. More widely, in an empirical study of skill mismatch among engineering graduates in the Middle East and North Africa, Ramadi, Ramadi and Nasr (2015) found that the areas in which managers considered that graduates needed most improvement were in soft skills such as communication, time management, and continuous learning. In Serbia, Gazibara et al. (2015) found that medical graduates were unprepared for a practical work environment.

2.2 MISMATCH IN THE PUBLIC SECTOR

Neoclassical economic theory proposes that individuals with higher levels of education or skills will earn higher wages in the labour market due to their greater level of human capital. In a competitive market, each worker will find a job that equilibrates their marginal productivity with their wage, so there can be no over- or under-education. However, market rigidities can upset this equilibrium, and in less than perfect markets mismatch phenomena may arise.[11] Since the labour market for public sector jobs is less competitive than for private sector jobs, a higher level of overeducation can be expected in the public sector compared to the private sector. This is because employers, given the choice, will typically prefer to hire overqualified candidates to benefit from their greater human capital endowment (Verhaest et al., 2018). From the graduate perspective, public sector employment may provide greater job security and many graduates are attracted to work in the public sector for that reason, especially in countries with a high level of precarious employment (Patrinos, 1997). In North Africa, Alattas (2023) argued, credentialism is pervasive in the public sector, meaning that qualifications are prioritised over skills leading to an overstaffed and inefficient public sector, and she consequently

[11] Such mismatch is usually referred to as "vertical" mismatch. In contrast, "horizontal" mismatch occurs when an employee's job field is not well matched to their field of study.

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expects a higher rate of overeducation in the public sector than in the private sector. She found support for this hypothesis using the statistical approach to measuring mismatch which shows a higher rate of overeducation in the public sector than in the private sector. However, in her work normative and subjective approaches, produced contradictory results.

2.3 THE GENDER DIMENSION OF MISMATCH

Overeducation also has a gender dimension. In many countries, women face discrimination in the labour market, and this may be reflected in higher rates of overeducation where access to jobs appropriate to women's levels of education is restricted, forcing them to take jobs at a lower occupational or skill level. Higher rates of overeducation among female graduates have been found in Italy (Betti, D'Agostino and Neri, 2021). In Spain, women's overeducation rates have been found to be slightly higher than men, evolving over time as more women came onto the labour market. At the same time overeducated women tended to experience a higher wage penalty than men (Pascual-Sáez and Lanza-Leon, 2023). For 22 EU countries, Baran (2024) analysed labour force survey data using the statistical method to identify rates of over-education and found that women's overeducation rates exceeded those of men (by up to a factor of two) in 21 of the EU countries studied. In Morocco, women mostly work in low-productivity sectors and low-paying jobs that require low skills (Canuto and Kabbach, 2023).

Relatively little research has been carried out to address the gender dimension of skill mismatch. Shin and Bills (2021) report on studies that have found that female workers tend to experience a lower level of under-skill mismatch in relation to both literacy and numeracy skills than male workers. In contrast, in a study carried out in Taiwan, Chuang and Liang (2022) found that skill mismatch is a more serious problem for female than for male workers. Women are often limited in the range of jobs they can apply for, which may limit their ability to find well-matched jobs.

2.4 EARNINGS PENALTIES AND MISMATCH

Qualification mismatch is known to affect earnings (Quintini, 2011). Overeducated workers may be employed in jobs with low levels of technology leading to lower salaries (Vecchia et al., 2023). At the same time, the frustration resulting from being overeducated may reduce work effort and also lead to lower productivity and lower wages (Tsang and Levin, 1985). The evidence from several studies consistently finds a "wage penalty" for overeducated workers, compared to the wage achieved by workers with the same level of education in matched employment (Allen and Van der Velden, 2001; McGuinness and Sloane, 2011; Santos and Sequeira, 2013). Undereducated workers typically earn more than those with the same level of education who are well matched to their (less productive) jobs, but the wage penalty of overeducation is usually found to be greater than the wage benefit of undereducation. This asymmetry has been explained by "assignment theory" which states that the wage is determined by the mix of education level and the productivity of capital (Sattinger, 1993; McGuiness, 2006). The wages of overeducated workers

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are constrained by the low productivity of the capital with which they work, while undereducated workers may benefit from working with capital assets that substitute for their relative lack of skill. A recent study of the wage penalty associated with overeducation in Jordan, Tunisia and Egypt identified a wage penalty associated with overeducation that varied widely from 17% in Egypt to 50% in Tunisia (El-amin, 2023). Additionally, Dolton and Vignoles (2000) argued that overeducated graduates in the public sector would earn less than over-educated graduates in the private sector because their skills would be less fully utilised due to the less competitive nature of the public sector.

This brief literature overview leads us to conclude that the key dimensions of interest in relation to the graduate labour market relate to differences in levels of mismatch in the public and private sectors of the economy, gender differences in mismatch, and the persistence of skill mismatch among graduates over time, while more broadly the balance of supply and demand for graduates may affect the balance between over- and under-education.

2.5 THE PERSISTENCE OF MISMATCH

Mismatch also has a time dimension, as individuals can become "trapped" in overeducation. Being overeducated in a first job after graduation can create a scarring effect and make it difficult for an individual to progress to more appropriate employment later on, especially if knowledge and skills gained at university become obsolete or depreciate over time. Several studies have found evidence of such persistence effects. Frenette (2004) found that Canadian graduates who are overqualified on entering the workforce are far more likely to remain overqualified in subsequent years. A study of persistence of overeducation during an individual's career was observed in Poland by Kiersztyn (2013) who found that more than half of those working in jobs below their level of education were still in that situation five years later. This was explained in part by the rapid increase in tertiary sector enrolment during the transition to a market economy and the economic recession that this induced. In a study conducted in Hungary, Poland, Lithuania and Slovenia, Robert (2014) found that mismatch in a graduate's first job has strong and long-lasting effect on the job match five years after the graduation. A later study in more stable conditions in Spain found that young workers who were overeducated in their first job were 40 percentage points more likely to be overeducated in a subsequent job compared to well-matched young workers (Acosta-Ballesteros, Osorno-del Rosal and Rodriguez-Rodriguez, 2018). Meroni and Vera-Toscano (2017) find evidence from 14 EU countries that overeducation at the beginning of a career leads to a greater likelihood of being overeducated later on. Similar findings have been reported for Germany (Schmelzer and Schneider, 2020; Erdsiek, 2021), Spain (Eguia, Gonzalez and Serrano, 2023) and Australia (Jackson and Li, 2022).

On the other hand, having a first job at a level below the individual's qualification or skills level can be a temporary stepping stone towards a more appropriate job at a later stage when labour markets are buoyant and when it is relatively easy to

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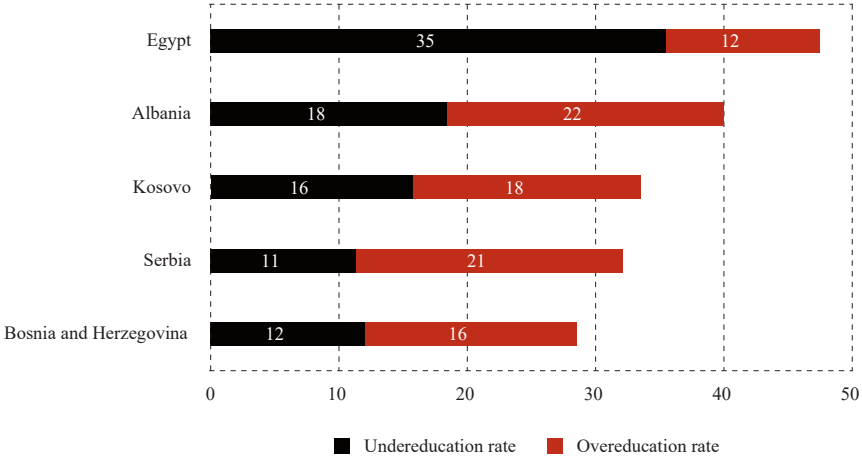
change jobs. A more recent study of the experience of university graduates in Spain found that job mobility partially corrects educational mismatch although there is still a strong persistence in educational mismatches four years after graduation (Albert, Davia and Legazpe, 2023). Thus, the picture appears to be mixed, partly depending on the balance between demand for skills resulting from labour market conditions and the rate of supply of graduates from the higher education system.

2.6 APPROACHES TO MEASURING QUALIFICATION AND SKILL MISMATCH

Three approaches to measuring such mismatch have been adopted in the literature: the statistical method (sometimes called the "realised matches" method), the normative method and the subjective method (McGuinness, Pouliakas and Redmond, 2018).

FIGURE 1

Mismatch among employees by the statistical method, 2023 (%)

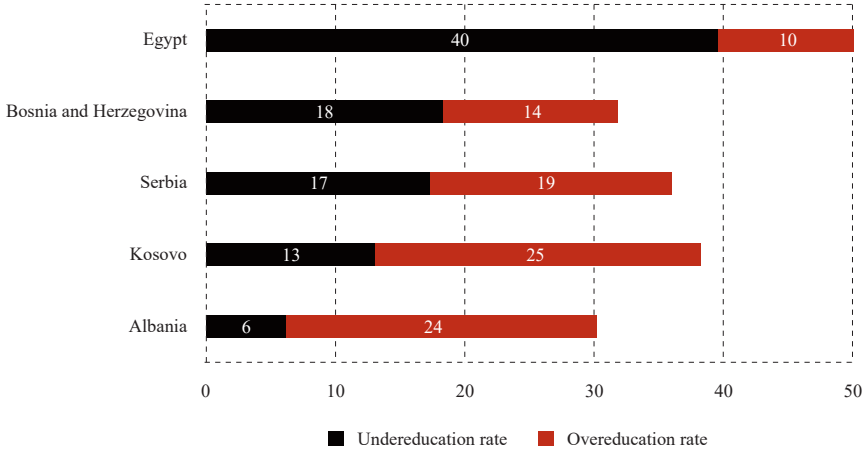


Source: ILOSTAT online data.

The statistical method compares a worker's actual level of education to the average level within an occupation. The advantage of this method is that it can be applied using existing labour force surveys; its disadvantage is that it does not provide any information on the skill levels actually required to do the job but simply reflects the average credentials of all workers within a given occupation. Moreover, if a large proportion of workers in an occupation are over- or under-qualified the statistical norm will reflect this, potentially underestimating the true extent of mismatch. Figure 1 shows the estimates of educational mismatch using the statistical method in several countries of North Africa and the Western Balkans for 2023, for those countries for which data is available; although Morocco is not included, Egypt could be taken as a North African proxy in the absence of Moroccan data. The figures show that Egypt has a higher overall level of mismatch than Western Balkan countries, with a comparatively high rate of undereducation. The overall qualification mismatch in Serbia was 32% in 2023 as measured by the statistical method, two thirds of which was accounted for by overeducation and one third by undereducation.

FIGURE 2

Mismatch among employees by the normative method, 2023 (%)



Note: 2019 is the most recent year for which data are available for all countries included in the chart.
Source: ILOSTAT database.

The normative method uses measurements of qualifications required in different occupations made by professional job analysts. Using data from labour force surveys, each individual is assigned a status based on whether their level of education corresponds to the qualifications required for their particular occupational group, based on the assumption that all jobs within a given occupational group require the same level of education (Quintini, 2011). Figure 2 shows estimates of educational mismatch using the normative method in 2023. As expected, the normative method produces slightly higher overall levels of mismatch. As with the statistical method the rate of undereducation exceeds the rate of overeducation in Egypt, while the opposite effect holds in most of the Western Balkan countries. Overall qualification mismatch in Serbia was 36% in 2023 as measured by the normative method, with a rough balance between overeducation and undereducation.

The "subjective" method, based on individual-level employee surveys, provides a more personalised method of assessing qualification or skill mismatch based upon the subjective perceptions of survey respondents. This method compares the highest level of qualification or self-assessed skill level of an employee with the self-assessed qualification or skill level required by the job. Unlike the other two methods, the subjective method also enables a measurement of over- and underskilling in addition to over- and underqualification mismatch.

In a major review of the literature, McGuinness, Pouliakas and Redmond (2018) found an average rate of overeducation of 25.9% based on over a hundred studies that used the statistical method, 25.5% in a smaller number of studies that used the normative method, and 21.5% from almost one hundred and fifty studies that used the subjective method. The ETF Skills and Jobs survey found an overeducation rate of 24% in Serbia (ETF, 2025). Thus, whichever method is used, overeducation appears

to be a widespread phenomenon. Studies of undereducation find an incidence ranging from 26.3% using the statistical method, 15.8% using the normative method, and just 10.7% using the subjective method (McGuinness, Pouliakas and Redmond, 2018).

In analysing studies covering 30 countries, McGuinness, Pouliakas and Redmond (2018) found an average rate of overskilling of 27.5% and an average rate of underskilling of 13.2%. Similarly, the 2019 European Company Survey showed that 26% of employees in the EU had a higher level of skills than was needed in their job, ranging from 16% in Slovakia to 35% in Germany.[12] In a study based on a meta-analysis of thirty-eight papers, the average overskilling wage penalty was found to be 7.5% (McGuinness, Pouliakas and Redmond, 2018).

3 THE SURVEY INSTRUMENT

Unlike the statistical or normative methods, the subjective method enables a deep insight into the characteristics of the respondents such as age, gender, educational background and sector of activity. This is the approach that we adopt in this paper, especially since no aggregate data are available for Morocco.[13] To implement the research we carried out a graduate survey in Morocco and Serbia from March to July 2024 using a specially designed questionnaire to identify the characteristics of the respondents, their qualifications, their skills, and their wages in work. The questionnaire was distributed by local university alumni associations using Google Forms. The Moroccan survey received 184 responses and the Serbian 97. The survey was supplemented by a series on in-depth interviews with key stakeholders in each country from higher education and business associations.

In the Moroccan sample, most graduates hold a master's degree, while the Serbian sample is equally balanced between bachelor's and master's degree holders. In the Serbian sample, most are graduates of the Faculty of Economics and Business, University of Belgrade, while in the Moroccan sample 60% of the respondents are graduates of the Faculty of Legal, Social and Economic Sciences, Université Ibn Zohr, 11% are ex-Faculty of Technical Sciences and 9% are Business School graduates, while the rest are from other faculties. The Moroccan sample is well balanced by gender, while in the Serbian sample three quarters of graduates are female. The age composition of the two country samples also differs. Recent graduates (under 30) account for two thirds of the Moroccan sample but for only one fifth of the Serbian graduates. Job security is higher in Serbia where nearly 90% of graduates work in a full-time job, compared to only 56% in Morocco, while 83% of the Serbian graduates hold a permanent or open-ended employment contract compared to about 70% in Morocco. Almost one third of the Moroccan sample are clerical support workers compared to 4% in Serbia, while in Serbia many graduates work as managers, professionals and associated professionals. The average length of job tenure in the graduates' current main job is about seven years in Serbia and about four years in Morocco. Over half (54%) of the Serbian graduates work in large

[12] See European company survey online data visualisation available at: https://www.eurofound.europa.eu/surveys.

[13] For this reason we were unable to include Morocco in figures 1 and 2 above displaying the mismatch indicators provided by the ILO using the statistical and normative methods.

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organisations with more than 250 employees, whereas only two fifths (38%) do so in Morocco. A slightly higher proportion of Serbian graduates (65%) is employed in the private sector compared to Morocco (55%). Over one fifth (22%) of the Moroccan sample are not in work, compared to only 3% in Serbia, reflecting the higher graduate unemployment rate in Morocco than in Serbia.[14] It also reflects the older age profile of the Serbian sample, since older graduates who have been pursuing their careers for longer are more likely to hold a steady job than more recent graduates. Excluding unemployed graduates, the effective sample for the mismatch analysis is 144 in Morocco and 94 in Serbia.

3.1 SKILL MISMATCH INDICATORS

The survey gathered information about graduate skills and the skills graduates needed during the course of their work. Graduates were asked to rate their level of proficiency for a set of fifteen skills on a scale of 1 to 7, where 1 stands for "none", and 7 stands for "top level" skill proficiency.[15] These "skill proficiency ratings" were collected for each graduate's highest education level and for their current level of proficiency.[16] For example, graduates were asked to rate the achievement of problem-solving skills at the end of their bachelor studies, at the end of their master studies and their current proficiency in problem solving. The graduates also rated the level of proficiency that is required of them in their current main job for the same fifteen skills, giving a set of "job skill proficiency ratings". For each skill, the mean skill proficiency rating was calculated across the graduates to obtain that skill's proficiency score. The skill proficiency score is continuous on the interval [1,7]. An Individual Skill Mismatch Indicator (ISMI) was constructed to measure both the incidence and intensity of skill mismatch, calculated by subtracting each graduates' skill proficiency ratings for 15 skills at various stages of their professional development from the job skill proficiency rating for each skill. Since ISMI is calculated by subtracting two interval variables that take discrete values between 1 and 7, an ISMI can take any discrete value between -6 and +6. An ISMI can hold a positive value, a negative value, or zero, capturing the three skill mismatch categories:

- "Overskill". A positive ISMI indicates a skill proficiency above the level required by the job in that particular skill. It takes discrete values on the interval [1,6].
- "Match". An ISMI of 0 indicates that the skill is well matched to the job requirement for that skill.
- "Underskill". A negative ISMI indicates that a graduate's skill proficiency is below the level required by the job for each skill. It takes discrete values on the interval [-1, -6].

[14] This is close to the national unemployment rates of 25.9% among workers with advanced educated in Morocco and 5.8% in Serbia as reported above.

[15] The 15 skills listed in the survey were: written communication, spoken communication, numerical analysis skills, foreign language skills, research skills, problem-solving skills. entrepreneurial skills, ability to manage time effectively, ability to work in teams, ability to work individually, digital skills, leadership skills, conflict management skills, and course-specific subject skills.

[16] A skill proficiency rating is an interval variable that can take discrete values on the interval [1,7] with a central value of 4.

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The frequency of a mismatch category for a skill is divided by the total number of participants to provide the share of the participants in each over-skill, match and underskill categories for that skill. Separating ISMI into the Underskill and the Overskill ISMI, allows a separate mean to be calculated for each mismatch category, which measures the intensity of skill mismatch and is called the Skill Mismatch Indicator (SMI). An Over-skill SMI of a skill is equal to the mean value of all Overskill ISMIs for that skill. An Underskill SMI is constructed in a similar way, using the Underskill ISMIs.

4 QUALIFICATION MISMATCH

In our survey, respondents were asked to report their qualification level and assess the qualification level required by the job they hold.[17] Qualification mismatch was calculated as the difference between these two measures.

Table 1

Qualification mismatch levels (%)

	Morocco	Serbia
Overqualified (overeducated)	38	32
Matched qualifications	49	66
Underqualified (undereducated)	13	2
Total	100	100

Source: Primary data.

Table 1 shows that almost two fifths of graduates in Morocco (38%) and almost one third in Serbia (32%) are overeducated. For Serbia, although the combined rate of over- and underqualification mismatch of 34% corresponds to the findings from the statistical and normative methods as shown in figure 1 (32%) and figure 2 (36%); the balance between overeducation and undereducation differs as we are here dealing with university graduates rather than the whole labour force. The correspondence to overall mismatch rates provides some confidence that these survey data are robust also for Morocco (for which the aggregate indicators of mismatch using the statistical and normative measures are not available). The overeducation rates for both countries are above the international survey average of 26.3% identified by McGuinness, Pouliakas and Redmond (2018) (as reported above). For Serbia, they are also down somewhat from the 39% graduate overeducation rate and the 15% undereducation rate for 2015 that was reported in Uvalić and Bartlett (2020). This progress might reflect a variety of factors, including a levelling off of the growth in graduates produced by the higher education system, or it may reflect improvements in graduate job search support institutions.

[17] Question 29 is phrased as: "Q29. Do the qualifications required in your current job match the level of qualification you obtained in your university education? PLEASE CHOOSE ONE
- My qualification level is lower than the qualification level required by my job
- My qualification level matches the qualification level required by my job
- My qualification level is higher that the qualification level required by my job."

Table 2

Qualification mismatch and highest level of educational attainment (% graduates)

	Morocco		Serbia	
	Bachelor's degree	**Master's degree**	**Bachelor's degree**	**Master's degree**
Overqualified	38	39	23	40
Matched	38	52	75	58
Underqualified	23	9	2	2

Source: Primary data.

The extent of qualification mismatch varies by the level of degree attained. Among graduates with a bachelor degree, fewer than two fifths (38%) are well matched in Morocco, compared to three quarters in Serbia (75%) (see table 2). This may suggest that bachelor's degrees in Serbia are better aligned with labour market needs than in Morocco. However, the proportion of well-matched graduates with a master's degree is similar in both countries at just over one half, suggesting that the degree of alignment between qualifications and labour market needs improves in Morocco as graduates proceed through the higher education system, while there is no such improvement in Serbia. Considering overqualification, the proportion of bachelor's degree graduates who are overqualified is higher in Morocco at 38% than in Serbia at 23%, while the overqualification proportions with master's degrees are similar in the two countries at around two fifths (39% and 40% respectively). Overqualification affects bachelor's and master's degree holders similarly in Morocco, while in Serbia, master's degree holders are twice as likely to be overqualified as bachelor's degree holders, again suggesting a relatively weak labour market alignment in Serbia at master's level.[18] A further difference is that almost a quarter of bachelor's degree holders in Morocco are underqualified, a phenomenon which does not occur in Serbia, suggesting weaknesses in the Moroccan higher education system in delivering graduates with the right level of qualifications for the contemporary labour market.

Table 3

Public and private sector qualification mismatch (% across match status)

	Morocco		Serbia	
	Public sector	**Private sector**	**Public sector**	**Private sector**
Overqualified	43	38	41	27
Matched	45	48	59	70
Underqualified	13	14	0	3

Source: Primary data.

There are wide differences in the level of mismatch across public and private sectors (table 3). While the share of overqualified graduates in the public sector at just over two-fifths is similar in the two countries, in the private sector there is a much higher rate of overeducation in Morocco than in Serbia. This confirms Alattas' (2023) argument that credentialism plays a large role in the employment of

[18] This is similar to findings by Frenette (2004) for Canada.

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graduates in the public sector in North African countries in both sectors. In Serbia, the role of credentialism appears to be important only in the public sector, reflecting the dynamics of patronage and "state capture" that has been widely observed in that country leading to the hiring of a wide spectrum of graduates more on the basis of political favouritism than of suitability for a particular public sector position (Tomić and Pavlović, 2023). Thus, in both countries, the public sector attracts many more overqualified graduates than the private sector, especially in Serbia.

Table 4

Qualification mismatch by gender (% graduates)

	Morocco		Serbia	
	Female	**Male**	**Female**	**Male**
Overqualified	45	34	34	25
Matched	48	49	63	75
Underqualified	8	17	3	0

Source: Primary data.

There are also substantial gender differences in skill matching in both Morocco and Serbia. For example, a female participant in a focus group discussion with recent graduates carried out during our fieldwork in Morocco told us that women with personal commitments prefer local opportunities, which are often limited. Overqualification rates of women have been found to commonly exceed those of men in the EU (Baran, 2024). This is also the case in both Morocco and Serbia, more women than men are overqualified (see table 4). This may reflect gender discrimination in the labour market and the role of a patriarchal society in biasing the job search process in favour of men (for Serbia see: Anić and Krstić, 2019; Ognjenović, 2021).

4.1 QUALIFICATION MISMATCH AND EARNINGS

Our survey contains information on the negative impact of qualification and skill mismatch in terms of the wage penalty.[19] Overeducation and overskilling, like undereducation and underskilling, create various efficiency costs and so mismatched employees tend to receive lower wages than well-matched workers.

Table 5

Qualification mismatch levels and average monthly wage (euro equivalent)

	Morocco			Serbia		
	All	**Female**	**Male**	**All**	**Female**	**Male**
Overqualified	810	773	855	1,352	1,190	2,200
Matched	1,070	1,063	1,091	1,860	1,721	2,200
Underqualified	839	720	908	1,200	1,200	–

Source: Primary data.

[19] For general perspectives on the wage penalty associated with skill mismatch see Nordin, Persson and Rooth (2010), Pecoraro (2016). For studies of the wage penalty in Serbia see Vuksanović and Aleksić (2022), in Bosnia and Herzegovina see Veselinović, Mangafić and Turulja (2020), in the MENA region see Elamin (2023).

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As expected, overqualified graduates suffer a wage penalty in both Morocco and Serbia (table 5). The proportionate wage penalty for all overqualified graduates in Morocco is 24%, while in Serbia it is 27%. There is also a gender dimension. In both countries, mismatched female graduates' wages are around 30% lower than wages of well-matched female graduates; for male graduates the wage penalty of qualification mismatch is about 20% in Morocco and 0% in Serbia compared to well-matched male graduates. Against the theoretical expectation, underqualified graduates in both countries also suffer a wage penalty. This may be due to a lack of suitably qualified graduates in Morocco, while in Serbia the proportion of underqualified graduates is very low, as shown above, so the comparison with well-matched graduates cannot be taken at face value.

There is also evidence of gender discrimination in the graduate labour market, especially in Serbia. For well-matched graduates in Morocco there is practically no gender bias in wages, while in Serbia well-matched male graduates' wages are 28% higher than those for well-matched female graduates. Qualification-mismatch wage penalties are also gender biased in both countries. In Morocco, overqualified male graduates earn a wage 11% higher than overqualified female graduates, while in Serbia the equivalent comparison gives male graduates an 85% higher wage than females. In Morocco, underqualified male graduates also have a wage advantage amounting to 26%.

In summary, the employment position of female graduates is worse than for male graduates in both countries. Women have lower wages, take lower-paid jobs, and jobs for which they may be overqualified far more often than men. The misqualification wage penalty is also higher for female graduates compared to male graduates. This gender wage bias is higher in Serbia than in Morocco.

Table 6

Public and private sector qualification mismatch by average monthly wage (euro)

	Morocco		Serbia	
	Public	**Private**	**Public**	**Private**
Overqualified	1,029	669	1,150	1,507
Matched	1,220	1,068	1,121	2,157
Underqualified	1,133	700	–	1,200

Source: Primary data.

Average public sector wages of well-matched graduates do not differ much between Morocco and Serbia, which is surprising considering the difference in GDP per capita between the two countries. In contrast, private sector wages of a well-matched graduate in Morocco are only half the level of wages in Serbia (table 6).[20] Within each country, average wages differ across public and private sectors, but in op-

[20] GDP per capita in 2023: Morocco $3,672, Serbia $11, 361, i.e. about three times higher in Serbia compared to Morocco. No data on average wages is available for Morocco (World Bank WDI online database).

posite directions. In Morocco, the average wage of a well-matched graduate in the private sector is a tenth less than in the public sector, while in Serbia the average wage in the private sector is almost double the average wage in the public sector. It should also be noted that in Serbia public sector wages have been supressed through fiscal consolidation and public sector reform programmes carried out in the mid-2010s (Vladisavljević, 2017). This, combined with a limited supply of graduates as evidenced by the relatively low graduate unemployment rate in Serbia has boosted private sector wages, whether a graduate is well matched or overqualified. In Morocco, in contrast, the oversupply of graduates has led to a lower wage for overqualified graduates in the private sector compared to the relatively protected public sector.

Considering overqualified graduates, in the Moroccan public sector overqualified graduates have a wage penalty of 16% compared to well-matched graduates, while in Serbia there is no wage penalty for being overqualified in the public sector. In the private sector the wage penalty facing overqualified graduates is 37% in Morocco and 30% in Serbia relative to the wages of well-matched graduates, with similar wage penalties for under-qualification.[21] This pattern no doubt reflects the high degree of patronage and credentialism connected to public sector jobs compared to private sector jobs in the European super-periphery, with public sector wages bearing relatively little relation to the qualification or skill level of the public sector employees.

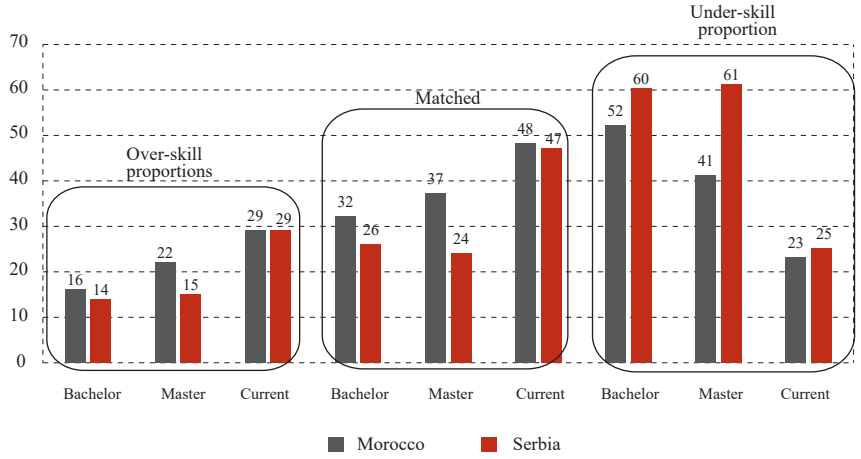
5 SKILL MISMATCH: PERSISTENCE EFFECTS

The persistence of mismatch can be measured by differences in skill mismatch on leaving university to the current level of skill mismatch experienced by a graduate. For the aggregate level (i.e., the mean over all 15 skills) the shares of overskill, match, and underskill among the graduates are shown in figure 3. These are shown in relation to the skills obtained from bachelor's degrees, master's degrees, and the current skill level at the time of the survey. A striking feature of this measurement of skill matching is that a greater proportion of graduates are in the under-skill category at both bachelor's and master's level (see figure 3), despite the relative preponderance of overqualification versus underqualification among graduates (see table 2 above).

[21] This finding contradicts the conjecture of Dolton and Vignoles (2020) who predicted that wage penalties would be higher in the public sector than the private sector.

FIGURE 3

Skill matching at different career stages, Morocco and Serbia (ISMI, % sample)



After graduating, two thirds of bachelor's degree graduates in Morocco (68% – the sum of over- and underskill) and three quarters in Serbia (74%) have skills that differ from the required level of skills for their job at the time of graduation, and the picture is similar for master's degree graduates (figure 3). At the time of the survey, in both countries three tenths of graduates were overskilled in relation to their "current" skill level and about one quarter were underskilled, these proportions being similar to those reported by McGuiness et al. (2018) in their review of the literature (see above).[22]

TABLE 7

Intensity of skill mismatch (SMI)

	Bachelor's degree skills			Master's degree skills			Current skill level		
	Over -skill	Match	Under -skill	Over -skill	Match	Under -skill	Over -skill	Match	Under -skill
Morocco, score	-1.66	0	2.40	-1.63	0	1.96	-1.79	0	1.34
Serbia, score	-1.83	0	2.47	-1.95	0	2.64	-2.01	0	1.35

Source: Primary data.

Table 7 shows the intensity of skill mismatch as measured by the mean of overskill and underskill SMIs. The higher the absolute value of the SMI, the stronger the mismatch effect. Skill mismatch at master's level ought to be less than at bachelor's level due to additional education leading to an improved level of matched skill and a lower level of underskill. In Morocco, there is indeed an improvement from bachelor's to master's level (the under-skill intensity falls from 2.40 to 1.96), but in Serbia the skill mismatch structure remains the same at master's level as at bachelor's level while the skill mismatch intensity increases, albeit marginally from 2.47 to 2.64. For current

[22] To recall, McGuinness, Pouliakas and Redmond (2018) found an average rate of overskilling of 27.5%.

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skill levels, the underskill mismatch is lower than at the point of graduation from bachelor's or master's degrees in both countries due to additional training, on-the-job learning and work experience since graduation. Correspondingly, the intensity of current over-skill mismatch is higher than for bachelor's and master's level reflecting additional skills gained over time in excess of that required by the job.

All the above suggests that graduates in both countries are *simultaneously over-qualified and underskilled for the jobs they hold*, especially in relation to the skills that were learned at university. As graduates pursue their careers they learn on the job or switch between jobs through the process of job mobility. This brings about a reduction in the proportion and intensity of underskill, and it even brings about an increase in the proportion and intensity of overskill.

6 CONCLUSIONS

As regions neighbouring the EU, North Africa and the Western Balkans face similar economic development challenges. Their labour markets are vulnerable to spillovers from economic cycles in the EU, which disturb their labour markets and skill matching processes. Yet, at the same time their labour market conditions differ with a high rate of graduate unemployment in Morocco and a relatively low rate in Serbia. We have used a graduate survey carried out from March to July 2024 in the two countries to identify mismatches on the respective labour markets.[23] Several findings relating to the extent of over-qualification are of note, relating to the incidence of mismatch among graduates, graduate mismatch in the public versus private sectors, gender discrimination, wage penalties of mismatch, and the persistence of mismatch.

The surveys reveal that almost two-fifths of graduates in Morocco and almost one third of graduates in Serbia are over-qualified for the job they hold, well above international norms. This suggests that there are too many graduates produced by the higher education systems in relation to labour market needs, especially in Morocco, and that many graduates are unable to find a suitable job that fully uses their level of education. Additionally, Morocco has a problem of underqualification, which particularly affects bachelor's degree holders and male graduates. This suggests that the higher education system in Morocco is not yet producing bachelor graduates of a sufficient level to meet the needs of the economy at the current level of technology.

The problem of overqualification is more severe in the **public sector** compared to the private sector in both countries. While over two-fifths of graduates in the public sector are overqualified in both countries, in Serbia only a quarter of graduates in the private sector are overqualified as are fewer than two-fifths in Morocco. This suggests that the public sector is attracting "too many" overqualified graduates, as compared to the private sector in both countries.

In both countries, **women graduates** suffer higher levels of overqualification mismatch than do men. While equal proportions of men and women are well matched

[23] As with all online surveys and a relatively small sample size it should be noted that the survey is not representative, and our findings are meant to be only suggestive of the key relationships involved. Additional future research on a larger scale would be needed to draw more definitive findings for the countries involved.

in Morocco, a far greater proportion of men than women are well matched in Serbia. This may reflect gender discrimination in the labour market in Serbia reducing the chances of even the most educated women in the country to find a well-matched job.

The analysis also provides an insight into the impact of qualification mismatch on graduate **wage differentials**. Firstly, in both countries, the average monthly wage is higher for male than for female graduates. Considering the differences between the public and private sectors, female graduates are mostly employed in the lower-paid sector in each country, which underpins the lower average female graduate wage. Furthermore, the findings provide insight into the **wage penalty** associated with qualification mismatch. The wage penalty has a gender dimension: qualification-mismatched female graduates suffer a wage penalty in both countries of around 25% compared to well-matched female graduates which is much higher than for male graduates; this gender wage bias is higher in Serbia than in Morocco. While there is little or no penalty for mismatched qualifications in the public sector, in the private sector the costs of qualification mismatch is a loss of about a third of the wage compared to a well-matched graduate. These different patterns likely reflect widespread practices of patronage, clientelism and credentialism in the super-periphery of the EU.

Turning to skill mismatch, we find evidence of **the persistence of mismatch**, but this is not absolute as there is evidence of the positive role of job mobility and on-the-job learning in reducing underskill mismatch, while overskill mismatch is increasing. Yet, upon leaving university, a relatively high proportion of graduates are found to be under-skilled, despite the relative preponderance of overqualification among them compared to the proportion who are underqualified. This suggests that graduates in both countries, upon leaving university, are *simultaneously overqualified and underskilled for the jobs they first acquire*.

The findings reported above are suggestive of higher education and labour market systems that are quite dysfunctional in both countries. Being in regions neighbouring the EU, they require effective and high-quality skill formation and utilisation systems to improve their competitive position on EU markets. In achieving this, their publicly-funded higher education systems have a major role to play, providing the labour market with graduates with appropriate skills, especially in an era of rapidly changing technologies. However, our findings reveal high levels of qualification and skill mismatch, in particular over-qualification and under-skill mismatch; there are also strong elements of under-qualification in Morocco. All this suggests that fundamental changes to the higher education systems in both countries are needed to provide a more appropriate set of graduate-level skills for their labour markets. In addition, a substantial and persistent misallocation of graduate labour is apparent, especially in relation to the respective needs of the public and private sectors and between genders, suggesting a need for improved methods of graduate job search assistance and career guidance that should be a policy priority in both countries and, by extension, in both of the regions in which they are located.

Disclosure statement
The authors have no conflict of interest to declare.

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