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ORIGINAL RESEARCH

Youth Unemployment, Gender and Institutions During Transition: Evidence from the Arab Spring

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Abstract
Youth unemployment in the Middle East and North Africa (MENA) region is the highest in the world surpassing all geopolitical regions. The MENA region witnessed sweeping changes negatively affecting the labor market and markedly increasing unemployment rates following the so-called Arab Spring that began in 2011. This paper meticulously examines the microeconomic determinants of youth unemployment in the MENA region using a unique and novel data on young people aged 15–29 from the year 2016. The results show that being a male and graduated from a public school increase the probability of being unemployed. Moreover, job concerns, corruption, and unequal rights in the society are also found to have a positive incidence on unemployment. However, we find that enhancing gender equality in the labor market, education, family codes, and political participation decreases the probability of employment. Similarly, the results indicate that improving economic inclusion in the post-Arab Spring decreases the probability of unemployment.

Keywords Unemployment · Gender · Youth · Institutions · Arab Spring

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1 Introduction

Identifying the determinants of unemployment among youth has a direct impact on enhancing productivity due to the direct role young people can play in the production process. Knowing such determinants can facilitate the pathway for policy makers in tackling

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the challenges that economies might suffer from (Noelke 2011). Thus, examining various factors contributing to the current levels of unemployment can have crucial implications in redressing the economic compass (Dimian 2011). For instance, studies have shown a strong correlation between youth unemployment and factors like gender, education, age, and institutions. Despite these auspicious implications, labor literature has rarely focused on the determinants of youth unemployment in the Middle East and North Africa (MENA) countries. Indeed, the existing investigation of the microeconomic determinants of youth unemployment in the MENA region is still limited. Understating the implications of institutional quality for youth unemployment gains more importance in light of the recent political changes the Arab Spring uprisings brought. The detrimental impact of youth unemployment in the MENA region and the role it has played in causing the recent unrests have propelled the debate about the determinants of youth unemployment and avenues to deal with this insurmountable challenge.

Youth unemployment in the MENA region is considered one of the highest worldwide, causing staggering levels of unemployment mainly for youth, and thereby further undermining the productivity of the MENA economies (Kabbani and Kothari 2005; Fakih and Ghazalian 2015b; Nauffal and Skulte-Ouaiss 2018; Dibeh et al. 2019). Likewise, female participation in the labor market of this region is considered one of the lowest globally. This has been intensified after the financial crisis of 2008, weakening the global aggregate demand and hindering the recovery of the global economy (O'Higgins 2001). Therefore, dealing with youth unemployment in the labor literature has been an inevitable task clarifying many equivocating assumptions about the causes of youth unemployment in the Arab world. The World Bank (2011) cites a low female employment rate reflecting mainly the implication of social and cultural norms that restrict the active participation of women outside their homes (Rauch and Kostyshak 2009). Females have also suffered more severe joblessness than males during recessions (De la Rica and Rebollo-Sanz 2017). Despite having anti-discriminatory gender laws, they attribute the low female employment to de facto discrimination rather than de jure discrimination.

In the same regard, countries in the MENA region suffer from lack of adequate resources to employ their youth and bring their best potential. This has resulted in high levels of youth female unemployment that has burdened economies with potential negative externalities (Tandrayen-Ragoobur and Kasseeah 2015). Thus, scholars have been considerably devoted to unfolding the determinants of youth unemployment in developing countries to provide further evidence for this pressing economic challenge from exacerbating the economic situation (Mitrakos et al. 2010). There is a shortage of reliable cross country unemployment data in the MENA region. Also, the quality of data and reported factors are also arguably endogenous to unemployment. In this context, it is worth noting that calculating youth unemployment with respect to those who are not in education, employment or training (NEET)[1] might entail several challenges. Statistics Canada (2015) highlighted that understanding youth labor markets has limitations due to the current methods of assessing youth unemployment rates. Indeed, youth NEET is defined as a 15–24 years old, who is part of the labor force, but unemployed, and not part of any in educational or vocational training schemes (International Labor Organization, ILO 2016).

[1] Furlong (2006) proposes the way NEET rate is calculated as follow: {(The unemployed youth) + (youth 'not in the labor force) – (unemployed youth and youth 'not in the labor force who are in education or training)}/(total number of youth) * (100 to express this ratio as a percentage).

This paper examines the microeconomic determinants of youth unemployment, making use of a novel dataset that provides detailed characteristics of youth in five major MENA countries. The dataset was extracted from the SAHWA Youth Survey (2016), a fundamental output of the SAHWA project covering Algeria, Morocco, Egypt, Lebanon, and Tunisia. We include a rich set of factors on youth socio-economic background, households, institutional settings in these countries, and Arab Spring related variables. Thus, this paper provides new evidence on the drivers of youth unemployment from a less studied region at a time of unprecedented political transitions that began in 2011. The findings show that being a male and having a high school diploma increase the probability of being unemployed. Additionally, having job concerns, corruption, and unequal rights in the society have also been found to have a positive incidence on unemployment; while improving the confidence in government, enhancing gender equality in both labor market and education, and improving economic inclusion in the post-Arab Spring decrease the probability of unemployment. Results by gender and by country remain qualitatively unchanged.

The remainder of the paper is organized as follows; in the next section, we briefly review related research on the microeconomic determinants of unemployment especially among youth. In Sect. 3, we describe the collected data and variables in hand, presenting the descriptive statistics, and discussing the empirical model. In Sect. 4, we thoroughly discuss the compiled results, and finally in Sect. 5, we provide concluding remarks.

2 Literature Review

2.1 Evidence from Developing Economies

The literature investigating the determinants of unemployment in African countries is rich. Msigwa and Bwana (2013) analyze the determinants of unemployment in Tanzania. They conclude that gender, geographical location, education, skills, and marital status are all significant variables in determining unemployment among youth in Tanzania; for instance, males are less likely to be unemployed than their female counterparts. In addition, those residing in urban areas are five times more likely to be unemployed than to be employed; education and vocational training are negatively correlated with unemployment. The study also shows that marital status, a significant determinant of unemployment, is positively correlated with unemployment. The paper recommends more robust government measurements to embolden female's position in having equal chances of education and vocational training.

In addition to race and gender, there are other causes of unemployment mainly the nature of jobs previously held. Such topics have been tackled by Baah-Boateng (2013) arguing that being unemployed in Ghana is highly associated with certain types of professions. The findings also conclude that the magnitude of full-time job seekers is an indicator of inadequate job opportunities. The author accompanies his conclusions with policy recommendations in which he highly encourages investments in sectors with high labor absorption levels, such as agriculture and manufacturing, to create more jobs and seriously tackle the issue of unemployment. The government is encouraged to intervene to properly redress the economic compass through reducing constraints that youth face when entering the labor market. Moreover, Baah-Boateng (2013) cites a higher unemployment rate for those with high school education, reopening the debate of bolstering vocational training, entrepreneurial skill training and startup support. However, job seekers who seek

self-employment are more likely to be unemployed relative to seekers of other types of employment. Thus, entrepreneurial training programs should attract young people leaving high school to help in establishing businesses and gradually expanding. In addition, wage expectation is a contributing factor to unemployment; having low wage expectations can yield lower probability of unemployment. Therefore, having a high rate of unemployment in Ghana is primarily attributed to various factors, such as education, wage expectation, lack of opportunities, insufficient vocational and entrepreneurial training.

Okafor (2011) identifies the main causes of youth unemployment in Nigeria. They argue that challenges to the democratic stability in Nigeria are a major cause of youth unemployment. The findings ascribe youth unemployment to the absence of government action to create employment and incentivize the economy. The author proposes boosting public investments in infrastructure and in post-secondary institutions to match the needs of the market. Broussard and Tekleselassie (2012) examine unemployment in Ethiopia by suggesting that education is a primary cause of unemployment, whether lack of education or having educational attainment that is incompatible with the Ethiopian labor market. The paper also suggests that living in an urban area increases the probability of being unemployed. More recently, Madhou and Sewak (2019) utilize multivariate filtering approaches to quantify structural unemployment, output gap, potential output, and unemployment gap in several Sub-Saharan countries. The results suggest that resource allocation in the educational sector, the exchange rate, and financial development are all determining factors for causing unemployment.

By the same token, Tansel and Tasci (2004) examine the dynamics of leaving unemployment and the duration of unemployment in Turkey. Their findings suggest that women are less likely to leave unemployment than men, suggesting that women may have a high reservation wage, due to the high shadow value of in-home activities. They argue that place marital status and place of residence are significant factors in determining the duration of unemployment. This may explain the rural–urban immigration in Turkey. Maqbool et al. (2013) study the determinants of unemployment in Pakistan, utilizing a dataset from 1991 to 2004. They examine the determining factors of unemployment, including population, Foreign Direct Investment (FDI), Gross Domestic Product (GDP), inflation, external debt, and unemployment. The findings suggest that population, FDIs and inflation have a substantial long-run effect on unemployment levels. Trimurti and Komalasari (2014) examine the causes of unemployment in Indonesia. The authors conclude that economic growth is not a significant factor in causing unemployment. Also, they suggest that inflation is positively correlated with unemployment. Policy recommendations include refraining from raising the minimum wage to control unemployment levels.

Evidence from the MENA region shows a strong correlation between being a woman or a younger more educated person and the probability of facing unemployment in Egypt (Bertoni and Ricchiuti 2017). Thus, according to this analysis, gender, age and occupation mismatch are positively associated with unemployment. It is worth noting that educated married individuals, regardless of the gender factor, residing in rural areas are less likely to be unemployed (Bertoni and Ricchiuti 2017). Therefore, unemployment in Egypt is mainly caused by factors comprising of age, gender, education, place of residence and marital status. By the same token, Stampini and Verdier-Chouchane (2011) attribute the exacerbating problem of unemployment in Tunisia to various factors, such as demographic boom, increasing the size of young population, popular short-lived jobs and weak growth for labor-intensive sectors including public administration. It is noteworthy that the rapid increase in the number of university graduates, accordingly, led to an increase in market participation especially among females. The authors propose a policy that is mainly

concerned with implementing measurements to enable the development of both the private sector and workers' skills. They also cite liberalizing labor laws through pushing towards more flexibility and removing any rigidity that might dis-incentivize employers from hiring. In examining the determinants of youth unemployment, the impact of the gender element is highly relevant (Stampini and Verdier-Chouchane 2011); women suffer from lower labor participation despite having tertiary education that aims to reduce the gap. They note that, among university graduates, women face higher unemployment rates, along with lower probability of being employed in the private sector.

Finally, Cárdenas et al. (2015) examine the determinants of unemployment in Latin America by citing a record of 10 million Latin Americans, between the ages 15–18, 19% of the population, who are neither working nor studying. They attribute unemployment to factors, such as household income per capita, socio-economic background, education, the number of children and several macroeconomic factors, such as trade openness and export sectors. They argue that the lack of adequate opportunities is amplifying the impact of unemployment in Latin American lowering productivity. The authors propose policy recommendations to foster educational opportunities and create employment opportunities. Also, in examining youth labour market trends in developing and transition economies, O'Higgins (2003) argues that long-run changes in population and demography can have a significant effect on youth unemployment. Furthermore, labor force participation, education and child labor are all contributing factors to youth unemployment to varying degrees.

It is worth mentioning at the end of this section the difficulties to distinguish unemployment from non-active population to define properly employment in a context with a limited formalization of labor contracts and a high presence of the informal sector especially in developing countries. Baah-Boateng (2015) argues that the ILO definition is narrow within the conditions of many African countries, such as Ghana. This definition categorizes many unemployed adults as discouraged workers, producing misleading results. Also, the paper suggests that there is a trade-off between the informal sector and unemployment rate. The paper recommends adopting a broader definition of unemployment that takes into account discouraged workers. Also, it recommends taking into consideration the informal sector to have a better understanding of the economic situation and how suitable proposed policy implications are. In the same context, Sylla (2013) argues that the standard unemployment does not include large number of employed or economically inactive adults. The author concludes that unemployment rate is not an accurate indicator of labor market performance. Thus, the papers' conclusions suggest a high unemployment rate in many developing countries is not necessarily a sign of poor labor market performance. Therefore, the author argues that labor market policy recommendations should be less dependent on unemployment rate, as it may produce misleading policy implications, due to the issues that have to do with not counting active/inactive segments of the labor market.

2.2 Evidence from Developed Economies

Stefanova-Lauerova and Terrell (2002) use the Labor Force Survey data (LFS) to examine the determinants of unemployment in the Czech Republic. They claim that gender has surprisingly been a significant determinant of unemployment in the Czech Republic for the last 10 years. They find that marital status negatively affected the chances of unemployment. The results suggest that females are less likely to enter the labor force after being unemployed, which leads to higher levels of female unemployment. The significant gap of unemployment between single and married females can be clearly

scrutinized once the gaps in education, region, and time-varying variables are taken into consideration. The model also suggests that less educated, both males and females, are more likely to be laid off and less likely to find a job. This implies a strong significance of education as an explanatory variable. Unlike the case of females, employers have more tendencies to readily hire men due to costly maternity benefits.

Rural unemployment rates are higher than urban rates due to the historical policies restricting labor mobility in South Africa (Kingdon and Knight 2004). Moreover, the majority of unemployed have never been employed before, an alarming indicator of the long-term unemployment problem. The authors argue that education and vocational training have a limited impact on reducing unemployment, emphasizing that these two factors may mitigate the effects of severity and duration of unemployment but such factors are not necessarily a guarantee of ending it. The racial factor plays a fundamental role in determining the chances of being unemployed; racism is deeply ingrained in the culture and accordingly in the labor market. In the policy recommendation section, the authors propose a mechanism of focusing on the racial gap through a set of integrated public programs to deal with social upheavals and discrepancies.

Race has also been an important factor in communities that have high levels of immigrants. Khattab (2006) examines the impact of individual and spatial factors in determining the risk of being unemployed for Israeli males aged between 20 and 24, concluding that determining unemployment is influenced by peculiar traits and to a lesser extent by the place of residence. By holding the regional context constant, ethnicity and skill mismatch, with few exceptions in minorities like Druze and Christians, are fundamental determinants of joblessness. He also argues that the segregation of ethnic minorities has yielded some benefits on residents in terms of promoting employment capacity, however, minorities' workers must, in this case, be willing to accept lower wages. In regards to policy recommendations, Khattab (2006) recommends policy makers to create more jobs not only in the enclave of minorities, but also in imposing quota rule in the distribution of employment opportunities. The paper argues that education is not a significant variable on its own, but rather jointly significant with the economic class, implying that class is a very significant variable in determining the chances of employment.

Mitrakos et al. (2010) provide a cerebral analysis of the determinants of unemployment in Greece, emphasizing the impact of explanatory variables like educational qualification. The paper claims that the problem of unemployment is an issue of transition from education to the labor market in both graduate education and tertiary education. In addition to educational qualification, gender is a significant explanatory variable. When holding all variables constant, female tertiary graduates are more likely to face unemployment than their male counterparts who possess similar qualifications. They conclude that identifying the determinants of unemployment in Greece, such as tertiary education, graduate education, and gender, is essential to formulate relevant policies for the purpose of mitigating its detrimental repercussions.

Schmillen and Möller (2010) claim that lifetime unemployment varies within West Germany; around 60% in the selected sample did not face unemployment between 25 and 50 years. The econometric models lead to various conclusions regarding the contributing factors of unemployment through adopting the use of censored quantile regressions. The results show a significant effect of factors like education and characteristics of jobs held when turning 25. In addition, the study finds that having an advantageous occupation at the beginning of the professional career is negatively correlated with lifetime unemployment. Such a conclusion is more evident in the higher quantiles of lifetime income distribution.

Furthermore, Demidova and Signorelli (2012) examine the dynamics of regional youth unemployment in the Russian regions to recommend implementable proper policy implications. The authors relate youth unemployment to causes, such as demographic characteristics, institutional factors, and family conditions. The authors also claim that macroeconomic determinants are fundamentally important in scrutinizing the causes of unemployment. They recommend combining both macroeconomic and microeconomic policies in achieving sustainable economic development, liberalizing the domestic economy and reforming labor laws.

More recently, Gangji and Plasman (2008) suggest that unemployment is determined by factors, such as state dependence, gender, region, age and nationality in Belgium. In addition to that, education is fundamentally important because it influences the chances of getting many jobs. The paper emphasizes the detrimental impact of state dependence on the labor market because it casts significant threats on the future of the Belgium labor market. The paper also concludes that unemployment yields lower long term productivity because it negatively impacts the behaviors of individuals and their work habits. This has been empirically proven that those who have been unemployed, they develop an attraction to leisure, resulting in less motivation for work, loss of skills, higher tendency of accepting lower wages and hurting productivity in the national level. The study recommends intensified efforts to prevent unemployment, especially young people shifting from school to the labor market to avoid facing unemployment.

In a more detailed study, Baussola et al. (2015) examine the determinants of unemployment and conclude that unemployment in Europe is highly correlated with state dependence, gender, area of residence, age and education. State dependence exacerbates the problem of unemployment by discouraging workers from persistently searching for jobs. In addition to that, males unexpectedly suffered from greater unemployment persistence than females during the great recession. The age factor is subdivided into two categories: both positively correlated with unemployment; the first implies a disadvantage that young workers suffer from due to difficulties faced when entering the labor force; the second is the exacerbating unemployment problem among old workers due to technological advancement, a phenomenon that requires an immediate government intervention. Education has mixed results varying between countries and across times. During the financial crisis, having a high educational level significantly reduced the risk of persistent unemployment in Spain and France. However, education's impact is negligible in countries, such as Italy and the UK, noting that when assessing the effect of education, elements like geographical differences should be taken into consideration.

Going beyond labor market institutions and observed individual-related characteristics, Cuesta and Budría (2015) attribute unemployment to non-conventional factors, such as non-cognitive skills in Germany. The authors argue that non-cognitive skills significantly affect the prospects of getting out of unemployment. In examining such variables, they take into account the persistence and unobserved heterogeneity that surrounds unemployment transitions. In addition, job search intensity, high productivity, and some personality traits, that can be traced back to early childhood, heavily influence the transition from being unemployed to unemployment.

Isengard (2003) suggests that unemployment in the UK and Germany is largely determined by a variety of institutional factors, such as the role of unions, the role of government intervention in the labor market and gender equality. He argues that both the type of labor policies conducted and the nature of the government institutions play a particularly fundamental role in influencing youth unemployment levels. The author recommends employment programs similar to the emergency employment program against youth

unemployment in Germany aiming at integrating youth into the labor market. Furthermore, welfare benefits should address certain types of unemployed, such as single mothers, handicapped and long-term unemployed.

Scarpetta (1996) claims that policy and institutional settings have markedly influenced the labor market, including youth unemployment across the Organization for Economic Co-operation and Development (OECD) countries. The efficiency of these governmental policies and their credibility among citizens are two salient factors of shaping the labor market and its unemployment rate. In closely examining the causality between rising unemployment and institutional factors, the author utilizes a static model in which he concludes that institutional factors, such as confidence in unions to bargain for wages and confidence in governmental policies to properly regulate the labor market, are statically significant determinants of unemployment.

Finally, Choudhry et al. (2012) argue that youth unemployment is contingent on a variety of factors involving labor market institutions and regulations. In addition, the authors examine other causes of youth unemployment, such as GDP growth, inflation, real interest rate, employment tax, and unemployment benefits. The authors confirm that having an active unionization and employment protection legislation is statistically significant with youth unemployment. They insinuate that policy makers should dynamically reform the labor market by adopting active policies to stimulate economic growth, foster economic freedom and promote part-time employment to mitigate the impact of financial crises on the labor market.

3 Methodology

3.1 Data and Variables

We use a unique dataset taken from the SAHWA Youth Survey (2016).[2] This survey consists of a novel and rich data covering five major MENA countries, which are Lebanon, Egypt, Tunisia, Algeria, and Morocco. The sample size is around 10,000 youth Arab respondents, mainly designed to be nationally representative of youth aged between 15 and 29 years in each of the five countries. The questionnaire covers the following themes: gender issues, socio-economic factors, education, skills mismatch, institutional issues, household characteristics, political engagement, cultural values, and the Arab Spring. It is worth mentioning that the SAHWA survey is designed to randomly select a young respondent from each targeted household, thus the analysis is carried out at the individual level.

In order to study the gender and institutional factors affecting youth unemployment in the MENA region, we consider the variable unemployment to be our dependent binary variable taking a value of one if the youth is unemployed, and zero otherwise. We use various characteristics related to youth socio-economic, parents' education, institutional factors, and political engagement. First, socio-economic characteristics include a binary variable for male, age in years, a binary variable for marriage, two binary variables for

[2] The SAHWA Project (www.sahwa.eu) is an interdisciplinary cooperative research project led by the Barcelona Centre for International Affairs (CIDOB) and funded by the European Commission. It brought together fifteen partners from Europe and Southern and Eastern Mediterranean countries to research youth prospects and perspectives in a context of multiple social, economic, and political transitions in five Arab countries (Algeria, Egypt, Lebanon, Morocco, and Tunisia).

education; one for being in a school and one for studying at university, one binary variable for the presence of a skill mismatch problem and finally a binary variable for studying in a public school. Second, household factors include two binary variables for the father having a school and university education and two more binary variables for the mother having school and university education. Third, institutional factors include a binary variable for perceiving the problem of job creation as the primary challenge facing the country, a binary variable in regards to concerns about corruption in the country. We also use two binary variables about placing no confidence in the government and unions. We include four binary variables for the perception of gender equality in the labor market, education, family codes, political involvement, and a binary variable to measure the perception of males having more rights than females. Finally, the explanatory variables involve two indicators of economic exclusion that facilitate considering the salient impact of the Arab Spring of 2011 on youth unemployment. Indeed, economic exclusion, before and after the Arab Spring, is captured by binary variables indicating both the economic situation and the ability to have a decent living. It is worth noting that many variables in the survey distinctively consist of pre- and post-Arab Spring information. Given that the data appear to come only from a 2016 survey this pre and post claim are perception- based information. In other words, respondents were asked questions about their perceptions prior to the Arab Spring and their current perceptions implying that the individuals do not have comprehensive a understanding of how the pre-Arab Spring situation was, but rather it reflects their perceptions about the changes that brought by the Arab Spring uprisings.

3.2 Sample Characteristics

Table 1 presents summary statistics of the full sample of variables used in our empirical examination. We observe that 21% of youth are unemployed in the MENA countries under consideration. Socio-economic determinants show that 54% of youth respondents are males and 23% of the respondents are married. Most respondents have high school education which is the highest attainment (69%) followed by a much lower figure for university education (27%). Among youth who responded to the survey, 72% of whom reported a skill mismatch problem. Even more, 84% of the respondents studied at public schools and 29% of whom are classified as upper class. Household factors indicate that 47% of the surveyed have fathers with school education, compared to only 10% of the fathers with a university education. In the same regard, 38% of respondents have mothers with school education, compared to 6% of mothers with a university education.

Institutional factors show that 89% of respondents perceive job creation as a primary concern showing a relatively low level of confidence in both the government and unions; that is, only 31% of respondents trust either the government or unions. Regarding the gender factors, 86% of respondents identify the need for government intervention to promote gender equality in the labor market; compared to 92% of respondents identifying the need for similar actions in promoting gender equality in education. Furthermore, 80% of surveyed think that the movement should promote gender equality in the family code issues, such as marriage, inheritance, childcare, and divorce. The results also show that 43% of youth believe that the government should promote gender equality in politics. The statistics also indicate that 79% of respondents believe that men have more rights than women in the labor market. Finally, we find that only 4% of youth participated in the Arab Spring demonstrations. Interestingly, we observe that 16% of youth report that they are economically excluded in the present time, while 29% of them were economically excluded before the

Table 1 Summary statistics of variables. *Source:* SAHWA Youth Survey (2016), author's analysis

	Mean	SD
Dependent variable: unemployment	0.21	0.41
Socio-economic factors		
Male	0.54	0.50
School	0.69	0.46
University	0.27	0.44
Skill mismatch	0.72	0.45
Public	0.84	0.36
Married	0.23	0.42
Upper class	0.29	0.45
Household factors		
Father has a school education level	0.47	0.5
Father has a higher education	0.10	0.31
Mother has a school education level	0.38	0.49
Mother has a higher education	0.06	0.23
Institutional factors		
Job concern	0.89	0.32
Concerning about corruption	0.92	0.28
Placing no confidence in government	0.31	0.46
Placing no confidence in unions	0.31	0.46
Gender equality: labor market equality	0.86	0.35
Gender equality: education equality	0.92	0.26
Gender equality: family code	0.80	0.40
Gender equality: involvement in politics	0.43	0.49
Men having more rights than women in jobs	0.79	0.41
Arab Spring factors		
Participating in demonstrations	0.04	0.19
Being economically excluded in the current time	0.16	0.37
Being economically excluded in pre-2011	0.29	0.45
Country		
Algeria	0.21	0.40
Egypt	0.20	0.40
Lebanon	0.20	0.40
Morocco	0.19	0.39
Tunisia	0.20	0.40
Area of residence		
Urban	56.07	0.37
Number of observations	9860	

Arab Spring. Tables 6 and 7 in the "Appendix" show the summary statistics of variables by gender and country, respectively.

Table 2 shows the percentage of unemployed by their characteristics. The results show that 57% of unemployed are males, while only 13% of unemployed are married. We observe that 74% of unemployed have a school education, while 20% of them have a university education. We also find that 62% of unemployed of those respondents suffer from a

Table 2 Percentage of unemployed youth by characteristic. *Source:* SAHWA Youth Survey (2016), author's analysis

Variable	Percentage
Unemployed youth	
Is a male	56.80
Has a school education	74.32
Has a university education	20.06
Reports a skill mismatch problem	61.84
Studied at a public school	91.59
Is married	12.72
Belongs to the upper class	21.23
Intuitional factors	
Concerning about corruption	91.83
Placing no confidence in government	33.46
Placing no confidence in unions	35.76
Gender equality: labor market equality	80.43
Gender equality: education equality	88.55
Gender equality and family code	74.85
Gender equality: involvement in politics	44.37
Man having more rights than women in jobs	82.19
Arab Spring factors	
Participating in demonstrations	4.31
Being economically excluded in the current time	20.99
Being economically excluded in pre-2011	36.84
Youth unemployed from	
Algeria	28.38
Egypt	8.17
Lebanon	6.63
Morocco	20.65
Tunisia	36.45
Youth unemployed from	
Urban	56.07
Number of observations	9860

skill mismatch problem. The data shows that around 92% of unemployed studied in public schools. We observe that 21% of unemployed belong to the upper class. The results also show that 92% of unemployed are concerned about corruption as the main challenge facing their country. Unemployed showed little confidence in both the government and unions. In fact, only 33% of unemployed placed confidence in the government compared with 36% trusting unions. In addition, the vast majority of unemployed saw a need for government consolidation to gender equality in various fields; 80% of unemployed expressed the need for government assistance to achieve gender equality in labor market compared with 88% favoring government efforts to embolden gender equality in education. In addition to education and labor market, 75% of unemployed supported government intervention to promote gender equality in family codes compared with 44% expressing their support of governmental measures in promoting women's involvement in political life. In the same regard, 82% of unemployed believe that men are granted more rights than women in the labor market. Examining the percentage of unemployed based on both institutional and

socio-economic factors pave the way to the Arab Spring factors in which 4% of unemployed youth participated in demonstrations. Finally, 21% of unemployed currently classify themselves as economically excluded compared to 37% in the period before 2011.

3.3 Modeling Approach

By using a probit model, the empirical analysis aims at examining the micro-determinants of youth unemployment in the MENA region:

$$Unemployment_i = Socio_i\,\beta_1 + Houehold_i\,\beta_2 + Instituitions_i\,\beta_3 + Arab\_Spring_i\,\beta_4 + \mathrm{u}_i$$

where $Unemployment_i$ is the dependent variable defined as binary variable equals to one if the youth is unemployed and equals to zero otherwise for a youth $i = \{1,\ldots,N\}$. The explanatory variables are the socio-economic factors ($Socio_i$), household factors ($Houehold_i$), institutional factors ($Instituitions_i$), Arab Spring factors ($Arab\_Spring_i$) and u_i is the error term, which follows a normal distribution. Finally, β_i are vectors of parameters to be estimated. Starting from the fact that a probit model is being used, estimating the probability of youth to be unemployed should come first, followed by generating the marginal effect of providing both the sign and magnitude of change in being unemployed in response to change in any of the independent variables.

We run eight different probit regressions in order to take into account the accurate impact of each category of the independent variables. Model 1 includes only socio-economic factors. Model 2 has only household factors. In fact, household factors have a considerable impact on future employment due to numerous psychological and multi-dimensional causes that involve the youth and their parents (Becker et al. 2010). In addition, Model 3 consists of combining both socio-economic and household factors. Next, Model 4 includes both institutional and Arab Spring factors, while Model 5 takes into consideration socio-economic, institutional and Arab Spring factors. Even further, Model 6 consists of involving socio-economic, household, institutional, and Arab Spring factors. Finally, Model 7 takes into account socio-economic, household, institutional, Arab Spring, and controls for countries. In order to dynamically verify our results and quantitatively diversify the regression models at hand, two interactive explanatory variables were formed through multiplying the male factor separately with both school and university education. Thus, Model 8 includes socio-economic, household, institutional, Arab Spring, country effects, and interaction terms.

4 Results and Discussion

4.1 Empirical Results

This section discusses the estimated marginal effects of the probit model that is presented in Table 3.

Beginning with Model 1 that includes only socio-economic factors, we find that education, skill mismatch, marriage and being part of the upper class are all negatively and significantly correlated with unemployment. Other socio-economic variables, such as having studied at a public school and being a male, are significant, however, positively correlated with unemployment. The robustness of such results in determining youth unemployment is consistent across the eight regression models in Table 3.

Table 3 Youth unemployment drivers in the MENA region (Probit model, marginal effects)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Socio-economic factors								
Male	0.008*		0.009**		−0.002	0.000	0.002	0.108***
	(0.004)		(0.004)		(0.007)	(0.006)	(0.001)	(0.035)
School	−0.188***		−0.136***		−0.171***	−0.135***	−0.094***	−0.032***
	(0.033)		(0.027)		(0.042)	(0.034)	(0.016)	(0.008)
University	−0.175***		−0.128***		−0.164***	−0.129***	−0.097***	−0.033***
	(0.021)		(0.015)		(0.028)	(0.022)	(0.008)	(0.012)
Skill mismatch	−0.078***		−0.066***		−0.062***	−0.055***	−0.051***	−0.052***
	(0.018)		(0.020)		(0.010)	(0.012)	(0.008)	(0.007)
Public	0.145***		0.123***		0.126***	0.111***	0.060***	0.054***
	(0.001)		(0.009)		(0.012)	(0.004)	(0.003)	(0.003)
Married	−0.131***		−0.129***		−0.126***	−0.123***	−0.061***	−0.061***
	(0.035)		(0.027)		(0.029)	(0.024)	(0.004)	(0.005)
Upper class	−0.057***		−0.047***		−0.046***	−0.037***	−0.046***	−0.046***
	(0.001)		(0.001)		(0.001)	(0.001)	(0.001)	(0.001)
Male*school								−0.101***
								(0.036)
Male*university								−0.113***
								(0.026)
Household factors								
Father has a school education level		−0.040***	−0.026***			−0.022***	−0.017**	−0.016***
		(0.001)	(0.002)			(0.002)	(0.007)	(0.006)
Father has a higher education		−0.008	0.014			0.017	0.016	0.016
		(0.021)	(0.019)			(0.027)	(0.031)	(0.031)

Table 3 (continued)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Mother has a school education level		−0.106***	−0.078***			−0.064***	−0.045***	−0.046***
		(0.009)	(0.011)			(0.011)	(0.001)	(0.001)
Mother has a higher education		−0.049	−0.017			−0.020	−0.013	−0.014
		(0.032)	(0.032)			(0.036)	(0.032)	(0.033)
Institutional factors								
Job concern				0.189***	0.159***	0.148***	0.105***	0.104***
				(0.030)	(0.028)	(0.024)	(0.001)	(0.000)
Corruption concern				0.109***	0.074***	0.069***	0.041*	0.042*
				(0.020)	(0.021)	(0.020)	(0.022)	(0.021)
Placing no confidence in government				0.011	0.026	0.035	0.028*	0.027*
				(0.044)	(0.039)	(0.041)	(0.014)	(0.014)
Placing no confidence in unions				0.022	0.006	0.004	0.012	0.013
				(0.065)	(0.056)	(0.057)	(0.037)	(0.036)
Gender equality: labor market equality				−0.072***	−0.045**	−0.038*	−0.022	−0.022
				(0.019)	(0.021)	(0.021)	(0.020)	(0.020)
Gender equality: education equality				−0.065***	−0.049***	−0.044***	−0.032***	−0.033***
				(0.019)	(0.006)	(0.006)	(0.011)	(0.011)
Gender equality: family code				−0.040***	−0.025***	−0.024***	−0.017	−0.018*
				(0.002)	(0.003)	(0.002)	(0.011)	(0.010)
Gender equality: involvement in politics				−0.028***	−0.017**	(0.011)	−0.012**	−0.012**
				(0.003)	(0.007)	(0.007)	(0.005)	(0.005)
Men having more rights than women in jobs				0.027***	0.024***	0.023***	0.020***	0.022***
				(0.010)	(0.007)	(0.007)	(0.003)	(0.001)

Table 3 (continued)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Arab Spring factors								
Participating in demonstration				0.024***	0.015***	0.011***	0.018	0.015
				(0.009)	(0.000)	(0.003)	(0.012)	(0.015)
Being economically excluded in the current time				0.015	0.009	0.004	0.000	0.001
				(0.022)	(0.024)	(0.022)	(0.019)	(0.019)
Being economically excluded in pre-2011				0.050***	0.047***	0.040***	0.018***	0.018***
				(0.001)	(0.006)	(0.003)	(0.001)	(0.002)
Country								
Algeria							0.223***	0.219***
							(0.063)	(0.060)
Lebanon							0.023	0.019
							(0.037)	(0.032)
Morocco							0.155	0.151
							(0.097)	(0.093)
Tunisia							0.254**	0.252**
							(0.125)	(0.123)
Area of residence								
Urban							−0.023*	−0.023*
							(0.014)	(0.014)
N	9860	9860	9860	9860	9860	9860	9860	9860
Pseudo R^2	0.058	0.030	0.070	0.046	0.089	0.097	0.129	0.131
Pseudo Log Likelihood	−4735.474	−4879.616	−4678.808	−4800.021	−4581.592	−4543.902	−4378.938	−4373.025

No education category is the reference group for education variables

Statistical significance: *= 10%; **=5%; ***=1%. Robust standard errors are in parentheses

The results of Model 2 show that having a school education is negatively and significantly correlated with unemployment for both parents, while higher education is not a significant variable for both parents. The robustness of these variables is confirmed by the results of the eight regressions models in Table 3.

Model 3 confirms the robustness of both the socio-economic and household factors. These results confirm the negative and significant correlation of many socio-economic variables, such as education, skill mismatch, marriage and being part of the upper class. Such results also confirm the positive and significant correlation of other socio-economic variables, such as having studied at a public school and being a male.

By meticulously examining the unique events of the Arab Spring, a wave of mass demonstrations that started in Tunisia in 2010 and led to toppling many Middle Eastern dictators including those who ruled for decades countries including Egypt, Tunisia, Yemen, and Libya, once can conclude that an accurate quantitative estimate of youth unemployment in the MENA region cannot avoid the impact of the recent political turmoil (Malik and Awadallah 2013). Thus, Models 4, 5, 6, 7 and 8 took into account institutional and Arab Spring related variables in the SAHWA Youth Survey.

We find that institutions and perception of economic exclusion in the pre-2011 period are robust in the 5 models. Specifically, Model 4 corroborates the robustness of both institutional and Arab Spring factors. We find that perceiving the problem of job creation as the primary challenge facing the country and reporting concerns about corruption in the country are found to have a positive incidence on the unemployment of youth. They also indicate that better gender equality in labor market, education, family codes, and political participation decreases the probability of unemployment. Moving to the Arab Spring perception related factors, we find that youth who perceive to be economically excluded before the Arab Spring were more likely to be unemployed, compared to their perception in the current time, i.e. after the Arab Spring. These results suggest the need for government intervention to promote gender equality in different dimensions (labor market, education, family codes, and politics) in order to reduce youth unemployment.

Model 5, 6, and 7 verify the joint robustness of the socio-economic, institutional and Arab Spring factors in determining youth unemployment. We find that being a male becomes not significant in these models. The combination of categories in Model 5 also led to a variation in the coefficients of some explanatory variables, such that of school and university variables.

Model 8 integrates two new explanatory variables, which are the interaction terms male*school and male*university. Surprisingly, both of these interaction variables decrease the possibility of facing unemployment, noting that such results are not consistent with some empirical evidence, such as Stefanova-Lauerova and Terrell's (2002) findings. In addition, country variables are added and showing positive effect of Algeria and Tunisia compared with the reference group Egypt. This explains the aggravating problem of youth unemployment in the Arab World.

By examining Table 4 that shows the results of regressions for both males and females separately, we can identify education, both school and university levels, as negatively impacting unemployment for both males and females. Having studied at a public school is negative and significant at the 1% level with coefficients 0.11 for males and 0.10 for females. Belonging to the upper class, surprisingly, decreases the chances of being unemployed only for males according to the regressions run in Table 4. When accounting for household factors, a female is unexpectedly less likely to be unemployed reinforcing the effective role of several household factors in reducing female unemployment. In fact, these results are antithetical with those of several authors in the literature review, such as those of

Table 4 Youth unemployment drivers in the MENA region by gender (Probit model, marginal effects)

	Male	Female
Socio-economic factors		
School	−0.199***	−0.080***
	(0.055)	(0.025)
University	−0.182***	−0.073***
	(0.032)	(0.015)
Skill mismatch	−0.077***	−0.027*
	(0.005)	(0.015)
Public	0.111***	0.100***
	(0.014)	(0.014)
Married	−0.148***	−0.103***
	(0.019)	(0.026)
Upper class	−0.053**	−0.021
	(0.022)	(0.019)
Household factors		
Father has a school education level	−0.002	−0.044***
	(0.006)	(0.006)
Father has a higher education	−0.008	0.049***
	(0.056)	(0.000)
Mother has a school education level	−0.062***	−0.066***
	(0.004)	(0.023)
Mother has a higher education	−0.023	−0.019**
	(0.063)	(0.008)
Institutional factors		
Job concern	0.139***	0.156***
	(0.010)	(0.038)
Corruption concern	0.088**	0.027
	(0.042)	(0.032)
Placing no confidence in government	0.020	0.037
	(0.016)	(0.064)
Placing no confidence in unions	0.030	0.013
	(0.040)	(0.069)
Gender equality: labor market equality	−0.026***	0.053
	(0.000)	(0.053)
Gender equality: education equality	−0.044***	−0.042***
	(0.003)	(0.012)
Gender equality: family code	−0.029***	−0.021*
	(0.003)	(0.012)
Gender equality: involvement in politics	0.001	−0.025
	(0.006)	(0.022)
Men having more rights than women in jobs	0.017	0.031***
	(0.013)	(0.002)
Arab Spring factors		
Participating in demonstration	0.006	0.011***
	(0.004)	(0.001)

Table 4 (continued)

	Male	Female
Being economically excluded in the current time	0.019	−0.011
	(0.012)	(0.038)
Being economically excluded in pre-2011	0.036***	0.047***
	(0.000)	(0.012)
Area of residence		
Urban	−0.009***	0.003
	(0.002)	(0.004)
N	4584	5276
Pseudo R^2	0.113	0.085
Pseudo Log Likelihood	−2465.236	−2054.102

No education category is the reference group for education variables

Statistical significance: * = 10%; ** = 5%; *** = 1%. Robust standard errors are in parentheses

Stefanova-Lauerova and Terrell (2002). The Arab Spring left a heavy toll on the labor market in the MENA region as a result of the increase in unemployment levels. Arab Spring perception related factors such as economic exclusion before 2011 has had a substantial impact on youth unemployment for both genders in the MENA region. It is noteworthy that participating in the demonstrations of the Arab Spring is a significant explanatory variable positively affecting unemployment for females.

In scrutinizing the results of Table 5 that includes five different regressions for the countries of the sample, we notice the significance of factors, such as male, university education and marriage. Being a male is, however, an insignificant explanatory variable in Morocco. Furthermore, marriage is negatively correlated with unemployment in Algeria, Morocco, Lebanon, and Tunisia. The interactive variable male × education is significant in several countries. Male × education is extremely significant in Egypt and Tunisia, with a marginal effect of 0.865 for Egypt and −0.505 for Tunisia. The Arab Spring perception related factors have had a considerable effect on increasing unemployment in the MENA region. The Arab Spring variables are markedly evident in Table 5 presenting the significance of explanatory variables, such as participating in demonstrations in Egypt and Tunisia and current economic exclusion in Morocco and Tunisia.[3]

4.2 Discussion

Msigwa and Bwana (2013) argue that gender, geographical location, education, skills, area of residence and marital status are all significant variables in determining youth unemployment. These results are consistent with our empirical findings. However, the authors claim that education is negatively correlated with unemployment, an inconsistent claim with our regression results in Table 5 that presents positive coefficients for both university education in Egypt and school education in Lebanon and Egypt. Furthermore, Stefanova-Lauerova and Terrell (2002) claim that the gender factor is positively correlated

[3] Arayssi and Fakih (2017) show that the effect of finance on growth was markedly plausible in the pre-Arab Spring period. However, this factor lost its significance after the Arab Spring.

Table 5 Youth unemployment drivers in the MENA region by country (Probit model, marginal effects)

	Lebanon	Algeria	Morocco	Tunisia	Egypt
Socio-economic factors					
Male	0.033*	0.242***	−0.035	0.543***	−0.748***
	(0.017)	(0.058)	(0.066)	(0.075)	(0.053)
School	−0.035	−0.305**	−0.102***	−0.039	0.043
	(0.028)	(0.149)	(0.009)	(0.057)	(0.030)
University	−0.051***	−0.313***	−0.215***	0.123***	0.086
	(0.016)	(0.056)	(0.017)	(0.041)	(0.079)
Skill mismatch	−0.072***	−0.128***	−0.004	−0.085***	0.013
	(0.008)	(0.001)	(0.048)	(0.004)	(0.009)
Public	0.015	0.173***	0.029	0.187***	0.030***
	(0.012)	(0.042)	(0.049)	(0.044)	(0.009)
Married	−0.058***	−0.173***	−0.158***	−0.162*	0.052***
	(0.005)	(0.014)	(0.014)	(0.090)	(0.002)
Upper class	−0.014*	−0.067***	−0.020	−0.066***	0.023
	(0.008)	(0.002)	(0.019)	(0.010)	(0.018)
Male*school	−0.069***	−0.182***	−0.014	−0.505***	0.865***
	(0.013)	(0.049)	(0.086)	(0.088)	(0.059)
Male*university	−0.025	−0.185***	0.025	−0.407***	0.958***
	(0.022)	(0.012)	(0.083)	(0.026)	(0.000)
Household factors					
Father has a school education level	−0.014	0.014	−0.067**	−0.053	0.019
	(0.017)	(0.030)	(0.028)	(0.053)	(0.020)
Father has a higher education	0.028***	−0.006	−0.029***	−0.041**	0.016*
	(0.010)	(0.033)	(0.002)	(0.017)	(0.010)
Mother has a school education level	−0.013	−0.093***	−0.039***	−0.111***	−0.005*
	(0.011)	(0.028)	(0.012)	(0.005)	(0.003)
Mother has a university education level	−0.001	−0.051	0.022	−0.161***	−0.006
	(0.010)	(0.053)	(0.020)	(0.023)	(0.026)
Institutional factors					
Job concern	0.098***	0.115	0.052***	0.149***	0.046**
	(0.005)	(0.076)	(0.015)	(0.002)	(0.023)
Corruption concern	0.039	−0.022	0.090***	0.041	0.033
	(0.046)	(0.016)	(0.006)	(0.078)	(0.133)
Placing no confidence in government	0.002	0.063***		0.017	−0.014***
	(0.006)	(0.001)		(0.041)	(0.002)
Placing no confidence in unions	0.039***	−0.036***		0.047	0.000
	(0.009)	(0.005)		(0.084)	(0.011)
Gender equality: labor market equality	−0.004	−0.017	0.033***	−0.080***	−0.020
	(0.009)	(0.065)	(0.005)	(0.016)	(0.019)
Gender equality: education equality	−0.020	−0.076*	−0.076***	0.009	0.059***
	(0.059)	(0.040)	(0.019)	(0.027)	(0.011)
Gender equality: family code	−0.006*	−0.016	−0.007	−0.044***	−0.010
	(0.003)	(0.022)	(0.013)	(0.013)	(0.013)

Table 5 (continued)

	Lebanon	Algeria	Morocco	Tunisia	Egypt
Gender equality: involvement in politics	−0.009***	0.013	0.008	−0.039***	0.012***
	(0.002)	(0.044)	(0.042)	(0.012)	(0.001)
Men having more rights than women in jobs	0.003	0.005	0.044	0.092***	0.019***
	(0.003)	(0.028)	(0.033)	(0.023)	(0.003)
Arab Spring factors					
Participating in demonstrations			0.017	0.053***	−0.033***
			(0.019)	(0.001)	(0.004)
Being economically excluded in the current time			0.015***	0.007	−0.012**
			(0.003)	(0.047)	(0.005)
Being economically excluded in pre-2011			0.070***	0.018***	−0.006
			(0.026)	(0.005)	(0.016)
Area of residence					
Urban	0.005***	0.011***	−0.071***	−0.116***	0.033***
	(0.002)	(0.002)	(0.016)	(0.003)	(0.004)
N	2000	2036	1854	2000	1970
Pseudo R^2	0.183	0.092	0.091	0.110	0.074
Pseudo Log Likelihood	−392.911	−1104.664	−903.331	−1174.971	−528.687

No education category is the reference group for education variables

Statistical significance: *=10%; **=5%; ***=1%. Robust standard errors are in parentheses. It is worth mentioning that estimates for the Arab Spring factors do not exist for Lebanon and Algeria because they did not witness major protests like Morocco, Tunisia, and Egypt

with unemployment confirming the findings of Escudero and Mourelo (2014) regarding the impact of the gender factor on unemployment. Such findings are nevertheless refuted by Table 4 that specifically presents males and females regression results. Gangji and Plasman (2008) conclude that unemployment in Europe is highly correlated with state dependence. Such conclusions are neither supported nor debunked by our empirical analysis due to the lack of sufficient data relevant to the MENA region that does not have efficient welfare benefits in the first place. Baussola et al. (2015) also argue that females suffer more severely from financial recessions than their male counterparts. Their conclusion is evidently confirmed by our empirical results in the Arab Spring perception related variables of Table 4 validating the claim that females are more likely to be affected by crises than males.

Bertoni and Ricchiuti (2017) argue that gender and occupation mismatch are positively associated with unemployment. This claim is consistent with our results to a certain extent. A discrepancy, however, is evidently noticed in Table 5 in which a skill mismatch problem is not a significant variable in Egypt. Bertoni and Ricchiuti (2017) also claim that married are less likely to be unemployed, a result consistent with our empirical analysis. Stefanova-Lauerova and Terrell (2002) also argue that living in a disadvantaged neighborhood increases the chances of being unemployed. This has been markedly confirmed by our regression models in the area of residence.

Choudhry et al. (2012) suggest that institutional factors, such as labor market reforms targeting unemployment and government intervention to restore confidence in government are statistically significant determinants of youth unemployment, confirming the empirical

findings of Table 3. Furthermore, Fakih and Ghazalian (2015a) corroborate the need for government intervention to foster gender equality in the labor market and increase female labor force participation in the MENA region. Such results are consistent with our regression models in Table 4 in the institutional factors highlighting the need for robust government intervention to mitigate the impact of gender discrimination on unemployment. In the same realm, our empirical findings conclude that having gender equality in both education and labor market is negatively correlated with unemployment, emphasizing the inescapable need to bolster gender equality in the labor market and family codes. Fakih and Ghazalian (2015a) argue that espousing policies to promote gender equality and improve women's well-being, social status and education can greatly reduce female unemployment, confirming the empirical results of Tables 3, 4 and 5. Choudhry et al. (2012) suggest that policy makers should actively reform the labor market by adopting active policies to stimulate economic growth and eliminate various causes of unemployment. Restoring back confidence in government, combating corruption and promoting gender equality are inevitable steps that should be meticulously espoused by policy makers. This is markedly aligned with the institutional factors of our empirical findings. In the same regard, Kregel (2011) argue that fiscal stimulus should be greatly utilized to mitigate the severity of economic exclusion after political and economic turmoil. This is particularly relevant to our results on the Arab Spring perception related factors that are statistically significant in multiple regressions.

5 Concluding Remarks

Unemployment is the source of various economic conundrums including poverty, homelessness and inequality (Eita and Ashipala 2010); therefore, tackling unemployment has become inevitable. During the last few decades, scholars have been globally devoted to unfolding the puzzling dilemmas regarding the determinants of unemployment (Mlatsheni and Rospabé 2002) to properly propose policy recommendations. Putting unemployed youth back on track is a global objective, especially after political and economic turmoils which usually exacerbates unemployment levels (Urbanos-Garrido and Lopez-Valcarcel 2015). Following the financial crisis of 2008, a spike of youth unemployment rates has been witnessed in various regions globally (Choudhry et al. 2012).

MENA region is no exception in this realm, thus, youth unemployment deserves similar attention from the academia sphere due to the inexorable impact of the Arab Spring uprisings on the labor market. The presented empirical model examines mainly the micro-determinants of unemployment in various regions concluding that these determinants include socio-economic factors, household factors, institutional factors, and Arab Spring perception related factors. The model corroborates the positive significant correlation between gender and unemployment attributing such relation to the intricate social structures of the MENA region. It is strongly evident that the Arab Spring's impact has largely been plausible in improving the perceptions of economic performance prospects.

Youth unemployment has been addressed by two different views, a traditional one that mainly attributes the problem of unemployment to the availability of jobs, and another reformist one seeking to dissect the problem by acknowledging the impact of supplying jobs, but it also bears in mind the causes that increase the probability of facing unemployment (Clark and Summers 1982). The level of education is one of the fundamental determinants of unemployment (Isengard 2003), especially that this factor largely shapes

the professional profile of many youth in the MENA region. Thus, government policies in dealing with unemployment have prominently featured the labor market and the economy at large shaping many contributing factors that youth are subject to when transitioning from school to the labor market, thus, emboldening the role of institutional factors in determining unemployment (Audas et al. 2005). Policy makers should concentrate their efforts on fostering gender equality in the labor market along with promoting substantial reforms in education ensuring that those residing in the lower centiles have equal opportunities to employment out of the fate of poverty and unemployment. The main findings also suggest that policy makers should actively reform the labor market by adopting active policies to stimulate economic growth and eliminate causes of unemployment (Choudhry et al. 2012). Restoring back confidence in government, combating corruption and promoting gender equality are inevitable steps that should be meticulously espoused by policy makers. Furthermore, fiscal stimulus should also be taken into consideration to mitigate the severity of economic exclusion after political and economic turmoil (Kregel 2011). When examined with inequality and social mobility, the effectiveness of policy recommendations in dealing with unemployment's causes could easily be implemented through combating corruption using unconventional mechanisms by activating the role of NGOs, families and social norms, intensifying the efforts to expand economic prosperity to those who are economically excluded before and after 2011 Arab Spring events.

It is worth noting that understanding youth labor markets is subject to some limitations that have to do with current methods of assessing unemployment rates and may entail numerous challenges (Statistics Canada 2015) compared to NEET indicator. Leach et al. (2010) cite that limitations may include discrepancies between total unemployment and registered unemployment, measurement difference, number of observations per year, geographic coverage and differences in age-groupings. More specifically, the discrepancies between registered unemployment and total one can lead to misleading results, as those who gave up on registering as unemployed are no longer part of the labor force. Other factors included also result in varying differences between different studies and methodologies. Therefore, future research might want to use different indicators when exam ining the drivers of unemployment like NEET rates in order to overcome these limitations. Another possible extension will be feasible when panel data become available allowing to account for the unobservable characteristics and the dynamic behavior of unemployed. This is of importance particularly for youth who are characterized by high discrepancies in the labor market in developing countries.

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Appendix

See Tables 6 and 7.

Table 6 Summary statistics of variables by gender

	Female		Male	
	Mean	SD	Mean	SD
Dependent variable: unemployment	0.19	0.39	0.22	0.41
Socio-economic factors				
School	0.66	0.47	0.71	0.45
University	0.29	0.45	0.25	0.44
Skill mismatch	0.73	0.44	0.71	0.46
Public	0.84	0.37	0.85	0.36
Married	0.28	0.45	0.20	0.40
Upper class	0.31	0.46	0.27	0.45
Household Factors				
Father has school education	0.48	0.50	0.47	0.50
Father has university education	0.10	0.31	0.10	0.30
Mather has school education	0.39	0.49	0.37	0.48
Mother has university education	0.06	0.24	0.06	0.23
Institutional factors				
Job concern	0.13	0.34	0.16	0.37
Concerning about corruption	0.03	0.16	0.04	0.21
Placing no confidence in government	0.31	0.46	0.30	0.46
Placing no confidence in unions	0.30	0.46	0.32	0.47
Gender equality: labor market equality	0.90	0.31	0.83	0.38
Gender equality: education equality	0.94	0.24	0.91	0.28
Gender equality: family code	0.84	0.36	0.77	0.42
Gender equality: Involvement in politics	0.36	0.48	0.48	0.50
Men having more rights than women in jobs	0.75	0.44	0.83	0.37
Arab Spring factors				
Participating in demonstrations	0.02	0.16	0.05	0.21
Being economically excluded in the current time	0.16	0.37	0.17	0.37
Being economically excluded in pre-2011	0.29	0.45	0.29	0.45
Country				
Algeria	0.21	0.41	0.21	0.40
Egypt	0.22	0.41	0.19	0.39
Lebanon	0.22	0.41	0.19	0.39
Morocco	0.14	0.35	0.23	0.42
Tunisia	0.22	0.41	0.19	0.39
Area of residence				
Urban	0.62	0.49	0.60	0.49
N	4584		5276	

Table 7 Summary statistics of variables by country

	Lebanon	Algeria	Morocco	Tunisia	Egypt
Dependent variable: unemployment	0.07	0.28	0.23	0.37	0.09
Socio-economic factors					
Male	0.50	0.53	0.65	0.50	0.50
School	0.61	0.74	0.65	0.75	0.71
University	0.38	0.24	0.25	0.24	0.25
Skill mismatch	0.91	0.72	0.64	0.69	0.62
Public	0.50	0.97	0.85	0.95	0.94
Married	0.20	0.09	0.11	0.14	0.64
Upper class	0.35	0.32	0.35	0.23	0.21
Household factors					
Father has school education	0.74	0.46	0.33	0.39	0.42
Father has university education	0.16	0.09	0.08	0.07	0.12
Mother has school education	0.76	0.37	0.19	0.26	0.30
Mother has university education	0.13	0.04	0.03	0.04	0.06
Institutional factors					
Job concern	0.03	0.11	0.14	0.36	0.11
Concerning about corruption	0.02	0.09	0.05	0.02	0.01
Placing no confidence in government	0.63	0.30	0.00	0.43	0.15
Placing no confidence in unions	0.30	0.36	0.00	0.43	0.43
Gender equality: labor market equality	0.95	0.77	0.80	0.88	0.91
Gender equality: education equality	0.98	0.90	0.84	0.93	0.97
Gender equality: family code	0.87	0.66	0.80	0.85	0.84
Gender equality: Involvement in politics	0.53	0.45	0.34	0.48	0.33
Men having more rights than women in jobs	0.79	0.78	0.70	0.86	0.82
Arab Spring factors					
Participating in demonstrations	0.00	0.00	0.13	0.03	0.04
Being economically excluded in the current time	0.00	0.00	0.15	0.40	0.28
Being economically excluded in pre-2011	0.00	0.00	0.18	0.75	0.52
Area of residence					
Urban	0.77	0.62	0.60	0.68	0.38
N	2000	2036	1854	2000	1970

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