

# Youth Employability and Skill Mismatch in Lebanon

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## **Abstract**

This paper explores factors explaining youth employability and the perception of the skill mismatch problem in Lebanon. We use a unique dataset covering young people aged from 15 to 29. The empirical analysis uses a bivariate probit model to jointly determine the probability of being employed and to perceive a skill mismatch problem. The estimation is conducted first over the whole sample of youth, and then it is implemented by region and gender. The main findings of our paper reveal that the labor market problems (employability and skill mismatch) are indeed jointly determined and that important differences across regions and gender are present. They also indicate the relevance of the following characteristics: youth age, marital status, higher education, and the level of financial support received from parents. The paper also offers some insights into youth labor market problems.

**Keywords:** Employability; Skill mismatch; Youth; Socio-economic factors; Bivariate probit model

## **Acknowledgements**

The research leading to these results has received funding from the European Community's Seventh Framework Programme FP7/2007-2013 under grant agreement n° 613174 for the SAHWA Project ([www.sahwa.eu](http://www.sahwa.eu)).

## **1. Introduction**

Employability is the primary concern of any job seeker, especially a new one who is part of the youth population. Employability is commonly related to a number of labor supply-side constraints, which adversely affect the potential of job entrants, especially the youth among them, to find jobs fast enough. These constraints relate to socio-economic characteristics of youth (e.g. age, gender, education, class), and regional specificities (Pool and Sewell, 2007). Employability is considered to be constrained when a labor market skill mismatch occurs. The mismatch is caused by the existence of skills (real or perceived) deficiency in the labor market. Skill mismatch has been identified to impose a significance drag on economic growth and job creation across the Arab Mediterranean Countries (AMCs) who have large youthful populations compared to other economic regions (Bhattacharya and Wolde, 2012; Fakhri and Ghazalian, 2015). Thus, we hypothesize that employability and skill mismatch problems are typically jointly determined in the labor market. In this paper, we argue that household and youth characteristics affecting youth employability may also play a role in understanding the skill mismatch problem.

Despite some efforts by the government to tackle the problem of youth unemployment in Lebanon, especially after the end of the civil war in 1990, the unemployment rate remains among the highest in the world. Table 1 shows a number of average comparative statistics over the period 2005-2015 on youth labor force participation in Lebanon, the Middle-East and North Africa (MENA) region, and the world. The table shows that youth labor force participation rate in Lebanon is the lowest in the world compared to all economic regions. In addition, it is lacking behind the average of the MENA countries. Looking at youth to adult unemployment rate in Lebanon, we observe a ratio that is higher than the average of the MENA region and it is among the highest in the world. Overall, these statistics are alarming and raise urgent labor policy questions that should be among the top priority items in policymaking in the country.

Understanding factors affecting youth employability and skill mismatch problems are, thus, an important requirement for evidence-based policymaking in the country. This is the case because low labor force participation rates result in bad social outcomes for the poor and lead to youth marginalization, which includes social exclusion, loss of health care coverage and income inequality (Dibeh et al., 2016). Understanding the employability and mismatch problems is also helpful to design policies that improve labor market regulations and institutions (Djankov and Ramalho, 2009).

The main purpose of this paper is to test the hypothesis that employability and skill mismatch are jointly determined in the labor market using Lebanon as a case study for the AMCs. Another objective is to determine the relevant household and youth characteristics that affect both employability and the perception of skill mismatch among the youth in Lebanon. This paper adds to the existing labor literature by providing new evidence from developing countries where empirical studies are scarce. Additionally, this paper uses a unique dataset from Lebanon covering young people aged from 15 to 29 years old. The data is sourced from the SAHWA Youth Survey (2016). The empirical analysis uses a bivariate probit model to jointly determine the probability of being employed and to perceive a skill mismatch problem. Unlike the univariate probit model, the methodology used in this paper allows for the error terms to be correlated across the employability and skill mismatch equations. The estimation is conducted first over the whole sample of youth, and then it is implemented by region and gender. The main findings of our paper reveal that the labor market problems (employability and skill mismatch) are indeed jointly determined and that important differences across regions and gender are present. They also indicate the relevance of the following characteristics: youth age, marital status, higher education, and the level of financial support received from parents.

The paper unfolds as follows. Section 2 summarizes the related literature on employability and skill mismatch issue. Section 3 presents the data, the main variables, summary statistics, and the empirical methodology. Section 4 details the empirical results. Finally, section 5 discusses the results and provides some concluding remarks.

## **2. Related literature**

Factors affecting employability and skill mismatch have received attention from several social sciences, especially economics (see for example Houston, 2005). The two problems constitute a significant constraint especially those young higher education graduates seeking to participate in the labor force. This constraint is especially acute in the AMCs that have seen a number of youth agitations during the period of the Arab Spring. Existing studies report variations across countries in factors affecting employability and in the perception of the skill mismatch problem. According to Fugate et al. (2004), employability reflects the set of attributes that lead to an active adaptation at the workplace. Among the attributes is a career identity that allows the worker to channel and enhance her active adaptation. In a

seminal paper on the relationship between minimum wages, labor market institutions, and youth employment, Neumark and Wascher (2004) use data from 17 OECD countries over the period 1975-2000 and find that minimum wages lead to employment losses among youth. Doiron and Gørgens (2008) find that a past employment period increases the chance of future employment, yet the length of employment does not matter. Their result suggests that maintaining a connection with the labor market is beneficial to the worker. Luecking and Fabian (2000), using a logistic regression based on selected US data from 1993 to 1997, find that employment behavior changes after the internship period is over. During the post internship period, gender, race and disability are not found to be important to the employment status. Bradley and Devadason (2008) find that youth in Bristol, UK are subject to more frequent job rotations, periods of unemployment, and lower salaries. In terms of perception, the main finding is that youth perceived their job market difficulties as transitory. Ibarraran et al. (2014) find that youth training programs in the Dominican Republic helped men improve their job formality and increase their earnings, yet these programs had no effect on the employment rate.

Moving to the skill mismatch problem, we can distinguish between workers and firms' perceptions. On the worker side, a real mismatch between skills and requirements results in wasted resources in terms of education, which leads to workers' dissatisfaction according to Tsang (1987) and to a high propensity to change jobs according to McGoldrick and Robst (1996). These nefarious effects result in lower profits for the firms (e.g. Groot, 1993) and in lower productivity for the workers (Belfield, 2000). Bender and Heywood (2009), using panel data for Ph.D. holders in the US, find that being married and having a professional experience are important determinants for the skill mismatch perception for males but not for females. Lassibille et al. (2001) use data from Spain to study the transition from school to work. They find that youth with higher educational attainment are less likely to report a skill mismatch problem. In addition, these youths have a shorter period of unemployment. However, Badillo-Amador and Vila (2013) find contradictory results where skill mismatch was weakly associated with the educational level in Spain. They also find that the mismatch problem is negatively correlated with wages.

On the firm side, Almeida and Aterido (2011) argue that, mostly in developing countries, mismatches between job requirements and workers' skills are one of the main hurdles that lower growth and productivity of firms. Skill mismatch also negatively affects the hiring decision of firm, which increases the unemployment rate and the costs of production (e.g.

O’Sullivan et al., 2011 for the MENA region). The mismatch also increases turnover rates (e.g. Hersch, 1991 for the US case). It also increases in firm size (Gelb et al., 2007; Kaplan and Pathania, 2010). Hallward-Driemeier and Aterido (2009), utilizing firm-level data from 105 countries, report that firms who are in the export sector are more likely to report a skill mismatch problem. Clarke (2010) confirms these results using data on firms from South Africa who perceive labor skill shortages as a major obstacle to business making. Lyon et al. (2012), using data from 25 developing countries, report that larger firms are more likely to find the skill mismatch as a major obstacle to production and growth.

### **3. Methodology**

#### **3.1 Data**

We use a novel micro dataset on Lebanon; the SAHWA Youth Survey (2016), which is a nationally representative survey of 2,000 youth aged between 15 and 29 years old.<sup>1</sup> The SAHWA Youth Survey is a comprehensive survey that covers all administrative regions of Lebanon. The survey is constructed by dividing the regions into strata in order to make sure a proper representation of the youth population in each geographic unit. Specifically, the survey covers a number of themes on household and youth characteristics such as household assets, dwelling characteristics, parent’s education and employment, education, labor market, social relationship, religion, political engagement, culture and values and migration. Finally, it is worth mentioning that it adopts a multi-stage probability sampling procedure to ensure a random, representative sample for identifying households and main respondents. This survey was also conducted in four other Arab countries: Egypt, Tunisia, Algeria, and Morocco.

#### **3.2 Variable definitions**

We use two dependent variables that are binary in nature. The first variable takes the value one if the youth is employed and zero otherwise. The second variable is defined to be equal to one if the young respondent reports that their education did not prepare him/her for the labor market and zero otherwise.

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<sup>1</sup> The SAWHA Project brings together a consortium of fifteen partners, universities and research centers from Europe and Arab countries to research youth prospects and perspectives in a context of multiple transitions under the leadership of the Barcelona Centre for International Affairs (CIDOB).

The explanatory variables are derived from the previous literature and cover a number of household and youth characteristics. Youth characteristics include the youth age in years; a binary variable that equals one if the young respondent is a male and zero otherwise; education is defined through four binary variables that are equal to one when the youth has acquired primary, middle, secondary, and higher education, respectively, and zero otherwise. We include a binary variable equal to one when the youth is in a public school and zero otherwise. A binary variable equal to one if the youth declares that, compared to people of his/her age, he/she is in the middle class or upper income category. Another binary variable is used to control for financial support received from parents. This variable is defined to capture the amount of money received to cover the youth personal needs. We also include a binary variable that captures the socio-economic concerns of youth. It is equal to one if socio-economic problems are reported as salient and zero otherwise. Moving to household characteristics we include four variables. First, we control for the household size defined by the number of people in the household or the family size. Second, father education is measured through a binary variable equals to one if the father has no education and zero otherwise. Third, we include mother education that is measured in the same manner as the father's education. Fourth, we create a dummy variable indicating whether or not the respondent has a capitalist parent. This variable equals to one if the father is both self-employed and an employer of others. The explanatory variables also include regional variables capturing the geographic distribution of the respondents. They include eight regional binary variables capturing all Lebanese regions. The nature of the residence area of the respondent is an additional variable that is captured by a binary variable that is equal to one when the residence is located in an urban setting and zero otherwise.

### **3.3. Summary statistics**

Table 2 presents the descriptive statistics of the variables for the whole sample, while Table 3 and Table 4 present those statistics by region and gender, respectively. Looking into the dependent variables, we observe that the average employability in our dataset is around 35% for the whole sample. However, when comparing between core and periphery regions, we notice some discrepancy between the two regions with 32% for the core and 38% for the periphery. Interestingly, figures by gender show substantial difference between male (44%) and female (24%) respondents. Moving to the second dependent variable, which is skill mismatch, we observe that the majority of respondents (92%) report that the mismatch problem is an issue. Comparing this variable by region and gender we detect little variation.

Youth characteristics show an equal distribution between male and female in the sample. The result of the summary statistics shows that the average age in the sample is 21 years old, while around 75% of youth are single. However, we observe that the proportion of single males is greater than single females as can be seen in Table 4. Moving to educational attainment, we observe that around 38% of youth have higher education with a small variation by region and by gender. Interestingly, youth with primary educational level constitutes the smallest group at an average of 4% in the whole sample, 3% in the core region, 5% in the periphery region, 6% for males, and 3% for females. We also observe that around 60% of youth attended public schools, yet this percentage is higher in the core region (60%) compared to 36% in the periphery region. Moreover, 35% of youth respondents reported that they belong to the upper and middle income social class. The summary statistics results also show that half of the youth received financial support from parents, while this number decreases to 43% in periphery regions. Finally, the proportion of youth who reported having a form of socio-economic concern is equal to 80%. This variable shows some variation by region and gender with 72% in the core, 90% in the periphery, 83% for male, and 78% for female.

Turning to household characteristics, we observe that the average number of people living in the household is equal to four. The percentage of non-educated fathers is 7%, while it is equal to around 2% in the core region and 14% in the periphery region. Similarly, non-educated mothers constitute 7% of all mothers. This figure decreases to 3% in the core region but increases to 12% in the periphery region. Finally, household characteristics indicate that around 9% of youth have a capitalist parent. This number remains more or less unchanged across region and gender.

Moving to regional characteristics, we observe that the majority of youth (46%) reside in Mount Lebanon, which is part of the core region, followed by the north region (11%), then by the south region (10%), which are part of the periphery region, and finally, Beirut (9.6%). In addition, we observe that around 77% of youth live in urban areas.

### **3.4 Econometric model**

As already mentioned, the objective of this paper is to study the determinants of youth employability and labor market skill mismatch problem. To do so we use a limited dependent variable model (probit).

Let  $E_i$  represent a binary variable equal to one if the youth is employed and zero otherwise for respondent  $i = (1, \dots, I)$ . Also, let  $M_i$  be a binary variable equal to one if the youth reports a skill mismatch problem. Variables  $E_i$  and  $M_i$  are observed since they indicate a decision or assertion made by the youth regarding employment and skill mismatch. These binary variables capture the benefits from being employed ( $E_i^*$ ) and the costs resulting from the skill mismatch problems ( $M_i^*$ ) that are actually not observed by the researcher. The variable  $E_i^*$  and  $M_i^*$  are defined as latent variables and not observed in the data; they can be represented as follows:

$$E_i^* = Y_i \alpha^E + H_i \beta^E + u_i^E, \quad (1)$$

$$M_i^* = Y_i \alpha^M + H_i \beta^M + u_i^M, \quad (2)$$

With the following probit rules:

$$E_i = \begin{cases} 1 & \text{if } E_i^* \geq 0 \\ 0 & \text{if } E_i^* < 0 \end{cases} \quad (3)$$

$$M_i = \begin{cases} 1 & \text{if } M_i^* \geq 0 \\ 0 & \text{if } M_i^* < 0 \end{cases} \quad (4)$$

In equations (1) and (2),  $Y_i$  is a vector of variables representing youth characteristics,  $H_i$  is the vector of variables representing household characteristics where the youth resides, and  $u_i$  is the error term. The vectors  $\alpha^E$ ,  $\beta^E$ ,  $\alpha^M$ , and  $\beta^M$  represent the vector of parameters to be estimated. Equations (1) and (2) can be estimated using the univariate probit model. However, such a model might produce biased estimators if the error terms include unobservable characteristics that influence jointly the dependent variables. Therefore, we use the bivariate probit model instead, which allows the error terms in equations (1) and (2) to be correlated in the estimation, where the dependent variables are jointly determined. We assume that the error terms are normally distributed and are independently and identically distributed. In the bivariate model we estimate the correlation parameter and we use the Wald test statistic to determine its significance.

## 4. Empirical results

In this section, we present and discuss the empirical results from the bivariate probit model for the whole sample first. We then present the results broken down by region and gender. In our empirical analysis we estimate the correlation parameter denoted by  $\rho$  in order to determine whether or not there is a correlation between the error terms across equations (1) and (2). We use the Wald test to determine the statistical significance of the correlation. We test if the null hypothesis indicating the absence of any significant correlation between the error terms should be rejected against the alternative hypothesis indicating the presence of a significant correlation. Therefore, if we reject the null hypothesis, we can conclude that employability and skill mismatch are jointly determined in the youth labor market.

### 4.1 Main results

Table 5 reports the empirical results from the main estimation, which includes the whole sample. First, looking at the results of the Wald test, we find strong evidence of the rejection of the null hypothesis at the 1% significance level, suggesting that equation (1) and (2) should be estimated using the bivariate probit model instead of the univariate probit model. This result supports the earlier mentioned hypothesis that employability level and skill mismatch problems are jointly determined in the labor market. Second, the result related to the correlation parameter  $\rho$  indicates that the error terms in equations (1) and (2) are negatively correlated with -0.288 and -0.238 at the 1% significance level for a model with regional dummies and another one without these dummies, respectively. It should be noted that columns (i) and (ii) are for the probability that youth is employed ( $P_r(E=1)$ ) and the probability that youth perceive a skill mismatch problem ( $P_r(M=1)$ ), respectively. These columns include seven regional dummy variables. Columns (iii) and (iv) have the same probability but exclude regional dummies. The results show that the log pseudo-likelihood number is higher for the model with regional dummies as can be seen in the last panel of the results, indicating a better explanatory power for columns (i) and (ii) that control for regional effects.

#### *Youth characteristics*

The results reveal that age is an important determinant for both the employability of youth and the problem of skill mismatch. We find that the likelihood of being employed increases with age at the 1% level of statistical significance, while the likelihood of young people to perceive a skill mismatch problem decreases with age at the 5% level of significance. We

also find that being male increases the likelihood of employability but it decreases the perception of suffering from a skill mismatch. Both effects are statistically significant at 1%. Single youth are more likely to be employed and to perceive a skill mismatch problem. These likelihoods are significant at 1% and 5% levels of significance, respectively.

Turning to educational attainment, we find that having a middle school level of education is not significant determinant of employability and of the perception of a skill mismatch problem, compared to youth with no education or primary education (our reference group). However, young people with secondary education level are less likely to be employed at the 5% significance level, but they are more likely to perceive a skill mismatch problem also at the 5% level of significance. Lastly, young people with higher education are more likely to perceive a skill mismatch problem at the 1% significance level, while it is not statistically significant for employability. Besides, having attended a public school is only statistically significant for the skill mismatch problem when we exclude regional effects in column (iv).

The implications of social class (upper and middle income social class) for employability and skill mismatch do not exhibit any statistical significance. The results in Table 5 also show that youth receiving financial support from their parents are less likely to be employed at the 1% significance level, while the effect of this variable on the skill mismatch problem is not statistically significant. Finally, socio-economic concerns of young people increase the likelihood of being employed only when we control for regional dummies in column (i) at the 5% significance level. However, having such concerns decreases the likelihood of perceiving a skill mismatch problem at the 10% significance level only in column (iv), which excludes regional dummies.

#### *Household characteristics*

Moving to the household characteristics, we find that household size is the most significant variable. Specifically, the results indicate that the number of people in the household is negatively correlated with the probability of young people to perceive a skill mismatch problem at the 1% significance level in columns (ii) and (iv). However, the results are not statistically significant for employability as shown in columns (i) and (iii). Interestingly, father's and mother's education are not statistically significant determinants for youth employability and skill mismatch problem with an exception for the implications of father's education on the likelihood of young people to perceive a skill mismatch problem. The results show that youth with fathers with no education are significantly less likely to report a

skill mismatch problem. This result is significant at the 1% significance level when we exclude regional dummies in column (iv). However, mothers' education plays no role in the skill mismatch perception. Besides, parents' education (fathers and mothers) results seem to suggest that the educational attainments of parents do not play a significant role in youth employability. Finally, we find that having a capitalist parent is not statistically significant in all specifications. This result seems to indicate that the wealth level of the household is not taken into account when young people report that are more likely to be employed and more likely to perceive a skill mismatch problem.

#### *Residence area*

The results reveal that urbanization is not an important determinant for youth employability and skill mismatch problem. The results are not statistically significant in all specification in columns (i)-(iv). That is, there is no difference between urban and rural areas in the probability to be employed and to report that skill mismatch between education and job requirements is a problem that faces youth in the labor market.

#### **4.2 Results by region**

Next, we turn our analysis to the results of bivariate probit model by region. The analysis is conducted separately for two regions. First, the core region includes Beirut (the capital city) and the adjacent Mount Lebanon governorate. Second, the periphery region includes South, Nabatieh, North, Akkar, Bekaa, and Baalbek regions. We use the same specifications as illustrated in the main results in Table 5, i.e. there are four specifications presented in columns (i)-(iv). Columns (i) and (ii) are for the joint probability that youth is employed and perceive a skill mismatch problem, respectively, in the core region. Columns (iii) and (iv) are for the periphery region. The results are presented in Table 6. As is the case in the main estimation reported in Table 5, the results of the Wald test strongly reject the null hypothesis at the 1% significance level suggesting that equations (1) and (2) by region should be determined jointly using a bivariate probit model. That is, youth employability and skill mismatch problems are jointly determined in the labor market also across regions. The results of the correlation parameter  $\rho$  show that the error terms in equations (1) and (2) are negatively correlated with -0.615 and -0.289 at the 1% significance level for core region and periphery region, respectively. Finally, when comparing the log pseudo-likelihood levels between the two regions we find that it is significantly higher in the core region, indicating a better explanatory power for the independent variables in the model of core region.

### *Youth characteristics*

In both the core and periphery regions, youth age is found to have a positive and statistically significant effect (at 1% significance level) on the employability of youth, while it is not relevant to the problem of skill mismatch. The effect of gender is found to be similar across the two regions. This indicates that males are more likely to be employed compared to females at the 1% significance level. However, they are less likely to perceive a skill mismatch problem also at the 1% significance level. Moving the marital status, we find that being single is positively correlated with the likelihood of being employed in the two regions at the 1% significance level, while it is positively correlated with the skill mismatch only in the core region at the 5% significance level.

With regards to educational attainment, compared to the category of primary and no education, the results show that having middle school education is positively correlated with the probability to perceive a skill mismatch problem only in the periphery region at the 10% significance level. Having a secondary education reduces the probability of being employed but it increases the probability to perceive a skill mismatch problem only in the periphery region at the 5% and 10% levels of significance, respectively. Finally, young people with higher education are more likely to perceive a skill mismatch problem at the 1% significance level in the two regions, while the results do not show any statistical difference in the likelihood of being employed between youth with higher education and those in the primary and no education category in the two regions. In the same context, we find that there is no difference between private and public schools.

The results of social class, financial support from parents and explicit socio-economic concerns, show interesting results. First, we find that social class decreases the probability to perceive a skill mismatch problem in the core region, while it increases this probability in the periphery region. Similar observations are found for the implications of socio-economic concerns of youth. Second, social class and socio-economic concerns are not found to be important determinants of employability in the two regions. Third, we find strong evidence that financial support received from parents reduces the probability being employed in the two regions. However, financial support increases the probability to perceive a skill mismatch problem at the 10% level only in the core region.

### *Household characteristics*

Household size is found to be statistically significant only for the skill mismatch problem. Specifically, we find that the household size has negative effect on the likelihood to perceive a skill mismatch issue in the two regions, while household size does not affect youth employability also in the two regions. Youth with non-educated fathers are less likely to perceive a skill mismatch problem only in the core region. Surprisingly, youth with non-educated mothers are more likely to perceive a skill mismatch problem but only in the core region. The results show that non-educated fathers and mothers do not exert a significant effect on youth employability in both regions. Finally, youth with capitalist parents are more likely to be employed only in the core region. This variable is not statistically significant with regards to the skill mismatch problem in the two regions.

### **4.3 Results by gender**

This section presents the results of the bivariate probit model by gender in Table 7, using again the same specification giving the main results. Columns (i) and (ii) report the results for the males, while columns (iii) and (iv) are for females. Looking at the Wald test, our results strongly reject the null hypothesis at the 1% significance level but for the male subsample. This results suggests that equations (1) and (2) should be estimated jointly but only for the male subsample. The results of the correlation parameter  $\rho$  are statistically significant only in the case of males. In other words, youth skill mismatch and employability seem to be simultaneously related for males but not for females. Finally, when comparing the log pseudo-likelihood levels between genders we find that it is significantly higher for males, indicating a better explanatory power for the independent variables in the model considering the male subsample.

### *Youth characteristics*

The results show considerable variations between males and females. Youth age is found to have a positive and significant effect (at 1% significance level) on employability across the two genders. However, the implications of youth age on skill mismatch problem are not statistically significant for both genders. Being single reduces the probability of being employed for males but increases it for females. The results also indicate being single is an important determinant for the skill mismatch problem but only for males.

Moving to educational attainment, we find that there are no significant differences between youth with middle school education and youth with primary or no educations (reference

group). Secondary education is found to be relevant only for males. Specifically, we find that youth with secondary education are less likely to be employed but only at the 10% significance level, while they are more likely to report a skill mismatch problem also at the 10% significance level compared to the reference group. Finally, males with higher education are less likely to be employed but more likely to report a skill mismatch issue at the 10% significance level. Interestingly, females are more likely to be employed and report a skill mismatch problem but only at the 10% significance level. Besides, the results for school type are not statistically significant indicating a similarity between youth in private and public schools on the probability to be employed.

Being in the upper and middle income class is found to have a positive effect on the likelihood to report a skill mismatch problem at the 5% significance level but for females only. Financial support received from parents is negatively correlated with youth employability at the 1% significance level for both females and males. However, financial support received from parents is positively correlated with the skill mismatch problem but only for males at the 5% level of significance. Finally, the socio-economic concerns variable is not statistically significant in all specifications.

#### *Household characteristics*

Household size decreases the likelihood to be employed and increases the likelihood to report a skill mismatch problem for males only at the 5% significance level. Youth with fathers with no education have a lower probability to be employed and to report a skill mismatch problem but only for males (5% significance level). The results for mothers' education are not statistically significant for both males and females suggesting that the educational background of mothers is not a relevant determinant for youth employability. Finally, male youth with capitalist parents are more likely to be employed at the 5% significance level. The result is not statistically significant for females.

#### *Residence area*

A female living in an urban setting is less likely to report a skill mismatch problem at the 5% significance level, while there is no difference between females living in urban areas and those living in rural areas in the probability of being employed. The same is found for males.

## **5. Discussion and concluding remarks**

This paper examines two topical labor market questions: employability and skill mismatch. These problems constitute a major obstacle for youth access to the job market, especially in developing countries where the divergence between the educational setting and job requirements is pronounced. Specifically, using a unique dataset on Lebanese youth, this paper examines the implications of socio-economic characteristics of youth and their households on the probability of being employed and on the likelihood of reporting a skill mismatch problem. This examination is based on a bivariate probit model that assumes that these two labor problems are jointly determined on the labor market. The empirical analysis is carried out for the whole sample first, and then it is repeated by region and gender.

The empirical analysis reveals a number of interesting results that can be summarized as follows.

In terms of youth characteristics, we find that employability and the perception of a skill mismatch problem are increasing in age. This result is robust across all three specifications (main, region, gender) except that youth age is not found to have an effect on the perception of a skill mismatch problem in the gender specification. We also find that being male increases the likelihood of employability but it decreases the perception of suffering from a skill mismatch in all specifications. Being single also increases the likelihood of being employed but it increases the likelihood of perceiving a skill mismatch issue. Yet at closer examination, we find that these results only hold for males but not for single females who are less likely to be employed and whose marital status does not affect their perception of skill mismatch. We find, across all specifications, that youth with secondary education are less likely to be employed. However, higher education is not found to be related to the employment status except that males with university level education are less likely to be employed than females. Moreover, we find that acquiring more education increased the likelihood to perceive a skill mismatch problem. Youth receiving financial support from parents are found to be less likely to be employed in all specifications. Yet only male youth and those living in the core region perceive a skill mismatch problem.

Turning to household characteristics, we find that youth living in larger households are less likely to perceive a skill mismatch problem, yet these youths are not less likely to be employed. Surprisingly, father and mother educational levels are not found to be relevant.

Having a capitalist parent increases the probability of being employed only in the core region and for males. Living in an urban or rural setting is not affecting youth employability.

These observations suggest that youth characteristics play a more important role than household characteristics in examining the twin problems of employability and skill mismatch. The results found in this paper also raise a number of policy issues. One of our findings indicates that being single reduces the probability of being employed for males but increases it for females. This finding hints to the presence of implicit discrimination against married women on the labor market and is in line with recent evidence from Lebanon showing that an important part of the gender wage is attributed to discrimination against married women (Dah and Fakh, 2016). Having found that the likelihood of perceiving a skill mismatch problem increases in the level of education, one may conclude that education raises job market expectations and with it perceptions of inadequacy and misfit on the job market. Needless to remind the reader about the genesis of the ‘Arab Spring’ and Mohamed Bouazizi, the young street vendor who immolated himself to death in protest against the lack of economic opportunity in December in 2010 in Tunisia, held a university degree. Moreover, frustrations related to a mismatch could lead to a reduction in job seekers’ efforts (Belfield, 2000), which results in lower labor productivity and negative macroeconomic implications on the economy. Another noteworthy result relates to non-significance of the social class and of parents’ wealth. This suggests that two students hailing from different socio-economic backgrounds may face similar labor market conditions in terms of employment and skill mismatch. General socio-economic concerns are shared by youth regardless of their employment status, which indicates that social malaise in Lebanon is a macroeconomic rather than a microeconomic problem.

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**Table 1:** Youth labor market indicators by economic region (averages, 2005-2015)

	Youth labor force participation rate	Youth to adult unemployment rate	Youth employment to population ratio
Lebanon	29.1	5.2	22.9
Middle East	31.4	3.7	23.2
North Africa	34.0	3.5	24.7
World	48.5	2.9	42.3
OECD countries	48.4	2.5	40.7
East Asia	55.7	2.9	50.3
South-East Asia and the Pacific	52.9	5.4	45.3
South Asia	42.6	3.8	38.4
Latin America and the Caribbean	52.9	2.9	45.3
Sub-Saharan Africa	54.3	2.0	47.7

Source: Key Indicators of the Labour Market (KILM) 2015 of the International Labour Organization.

**Table 2:** Descriptive statistics of variables used in the analysis

	Mean	Standard Deviation	Minimum	Maximum
<b>Dependent variables</b>				
Employability	0.344	0.475	0	1
Skill mismatch	0.919	0.273	0	1
<b>Independent variables</b>				
<i>Youth characteristics</i>				
Age: years	21.708	4.681	15	29
Gender: male	0.502	0.500	0	1
Marital status: single	0.745	0.436	0	1
Education: primary	0.036	0.188	0	1
Education: middle	0.220	0.414	0	1
Education: secondary	0.352	0.478	0	1
Education: higher	0.383	0.486	0	1
School type: public	0.496	0.500	0	1
Social class: upper & middle	0.347	0.476	0	1
Financial support from parents	0.500	0.500	0	1
Socio-economic concern	0.798	0.401	0	1
<i>Household characteristics</i>				
Household size: number of people	4.091	1.493	1	12
Father's education: none	0.071	0.256	0	1
Mother's education: none	0.074	0.261	0	1
Capitalist parents	0.086	0.281	0	1
<i>Regional characteristics</i>				
Akkar	0.047	0.212	0	1
Baalbek	0.054	0.227	0	1
Bekaa	0.055	0.229	0	1
Beirut (capital city)	0.096	0.294	0	1
North	0.112	0.316	0	1
South	0.099	0.299	0	1
Mount Lebanon	0.464	0.499	0	1
Nabatieh	0.068	0.252	0	1
<i>Residence area</i>				
Urban	0.772	0.420	0	1
<i>N</i>	2000			

**Table 3:** Descriptive statistics of variables by region

	Core region		Periphery region	
	Mean	Standard Deviation	Mean	Standard Deviation
<b>Dependent variables</b>				
Employability	0.318	0.466	0.379	0.485
Skill mismatch	0.979	0.142	0.840	0.367
<b>Independent variables</b>				
<i>Youth characteristics</i>				
Age: years	21.427	4.809	22.068	4.488
Gender: male	0.490	0.500	0.518	0.500
Marital status: single	0.749	0.434	0.740	0.439
Education: primary	0.027	0.161	0.049	0.216
Education: middle	0.214	0.410	0.228	0.420
Education: secondary	0.361	0.481	0.340	0.474
Education: higher	0.393	0.489	0.369	0.483
School type: public	0.604	0.489	0.356	0.479
Social class: upper & middle	0.368	0.483	0.321	0.467
Financial support from parents	0.553	0.497	0.432	0.496
Socio-economic concern	0.724	0.447	0.901	0.299
<i>Household characteristics</i>				
Household size: number of people	3.845	1.290	4.406	1.668
Father's education: none	0.016	0.126	0.142	0.349
Mother's education: none	0.035	0.183	0.124	0.330
Capitalist parents	0.093	0.290	0.079	0.270
<i>N</i>	1124		876	

Note: Core region includes Beirut (the capital city) and adjacent Mount Lebanon. Periphery region includes South, Nabatieh, North, Akkar, Bekaa, and Baalbek.

**Table 4:** Descriptive statistics of variables by gender

	Male		Female	
	Mean	Standard Deviation	Mean	Standard Deviation
<i>Dependent variables</i>				
Employability	0.444	0.497	0.244	0.430
Skill mismatch	0.891	0.311	0.946	0.225
<i>Independent variables</i>				
<i>Youth characteristics</i>				
Age: years	21.403	4.672	22.016	4.672
Marital status: single	0.835	0.372	0.654	0.476
Education: primary	0.059	0.235	0.032	0.177
Education: middle	0.243	0.429	0.197	0.398
Education: secondary	0.323	0.468	0.381	0.486
Education: higher	0.375	0.484	0.390	0.488
School type: public	0.513	0.500	0.479	0.500
Social class: upper & middle	0.351	0.478	0.344	0.475
Financial support from parents	0.494	0.500	0.507	0.500
Socio-economic concern	0.825	0.380	0.778	0.416
<i>Household characteristics</i>				
Household size: number of people	4.155	1.529	4.026	1.455
Father's education: none	0.077	0.266	0.065	0.247
Mother's education: none	0.078	0.268	0.070	0.256
Capitalist parents	0.087	0.281	0.086	0.281
<i>Regional characteristics</i>				
Akkar	0.049	0.215	0.046	0.210
Baalbek	0.053	0.224	0.056	0.231
Bekaa	0.051	0.220	0.060	0.238
Beirut (capital city)	0.084	0.277	0.109	0.311
North	0.120	0.326	0.105	0.306
South	0.108	0.311	0.090	0.287
Mount Lebanon	0.465	0.499	0.467	0.499
Nabatieh	0.071	0.256	0.066	0.249
<i>Residence area</i>				
Urban	0.754	0.431	0.790	0.408
<i>N</i>	1005		995	

**Table 5:** Benchmark results (Bivariate probit)

	(i)	(ii)	(iii)	(iv)
	Pr(E=1)	Pr(M=1)	Pr(E=1)	Pr(M=1)
<i>Youth characteristics</i>				
Age: years	0.173*** (0.016)	-0.037** (0.015)	0.172*** (0.016)	-0.031** (0.014)
Gender: male	1.213*** (0.103)	-0.427*** (0.103)	1.216*** (0.103)	-0.391*** (0.094)
Marital status: single	0.734*** (0.116)	0.283** (0.138)	0.748*** (0.115)	0.248** (0.123)
Education: middle	-0.045 (0.259)	0.165 (0.202)	-0.127 (0.260)	0.309 (0.188)
Education: secondary	-0.599** (0.264)	0.408** (0.202)	-0.647** (0.264)	0.529*** (0.189)
Education: higher	-0.200 (0.276)	0.926*** (0.214)	-0.235 (0.276)	0.870*** (0.202)
School type: public	-0.014 (0.116)	0.021 (0.113)	-0.023 (0.114)	0.184* (0.103)
Social class: upper & middle	0.033 (0.120)	0.017 (0.122)	0.036 (0.119)	0.126 (0.111)
Financial support from parents	-8.073*** (0.221)	0.208 (0.139)	-8.101*** (0.179)	0.215 (0.134)
Socio-economic concern	0.251** (0.124)	-0.059 (0.137)	0.178 (0.116)	-0.208* (0.124)
<i>Household characteristics</i>				
Household size: number of people	0.029 (0.034)	-0.088*** (0.032)	0.028 (0.032)	-0.152*** (0.029)
Father's education: none	-0.001 (0.217)	-0.230 (0.175)	-0.087 (0.205)	-0.471*** (0.165)
Mother's education: none	-0.222 (0.188)	0.039 (0.184)	-0.204 (0.185)	0.046 (0.179)
Capitalist parents	0.348 (0.213)	0.126 (0.207)	0.242 (0.210)	0.071 (0.182)
<i>Residence area</i>				
Urban	0.175 (0.125)	-0.157 (0.112)	0.129 (0.117)	-0.041 (0.107)
<i>Region</i>	Yes	Yes	No	No
<i>N</i>	2000	2000	2000	2000
$\rho$	-0.288*** (0.092)		-0.238*** (0.090)	
<i>Wald test (chi2)</i>	8.628		6.364	
<i>p-Value</i>	(0.003)		(0.011)	
<i>Log pseudo-likelihood</i>	-829.645		-908.008	

Note: E, employability and M, skill mismatch. Primary and no education is the reference group for education. Statistical significance: \*=10%; \*\*=5%; \*\*\*=1%. Robust and residence area clustered standard errors are in parentheses.

**Table 6:** Results by region (Bivariate probit)

	Core region		Periphery region	
	(i)	(ii)	(iii)	(iv)
	Pr(E=1)	Pr(M=1)	Pr(E=1)	Pr(M=1)
<i>Youth characteristics</i>				
Age: years	0.136*** (0.024)	-0.060 (0.039)	0.209*** (0.023)	-0.015 (0.017)
Gender: male	1.272*** (0.146)	-0.893*** (0.285)	1.161*** (0.153)	-0.303*** (0.115)
Marital status: single	0.669*** (0.162)	0.621** (0.294)	0.892*** (0.170)	0.118 (0.160)
Education: middle	0.136 (0.384)	0.249 (0.533)	-0.333 (0.362)	0.423* (0.222)
Education: secondary	-0.341 (0.387)	-0.009 (0.546)	-0.820** (0.370)	0.861*** (0.227)
Education: higher	0.012 (0.410)	7.061*** (0.841)	-0.531 (0.385)	0.992*** (0.232)
School type: public	0.068 (0.171)	-0.042 (0.283)	-0.137 (0.158)	0.026 (0.120)
Social class: upper & middle	0.192 (0.175)	-0.707** (0.305)	-0.133 (0.166)	0.373*** (0.137)
Financial support from parents	-8.309*** (0.282)	0.971* (0.576)	-8.027*** (0.251)	0.113 (0.146)
Socio-economic concern	0.099 (0.153)	-0.633* (0.357)	0.276 (0.217)	0.391** (0.165)
<i>Household characteristics</i>				
Household size: number of people	0.032 (0.057)	-0.185** (0.079)	0.019 (0.040)	-0.074** (0.033)
Father's education: none	-0.820 (0.520)	-2.376*** (0.558)	-0.008 (0.232)	-0.173 (0.173)
Mother's education: none	0.236 (0.376)	8.179*** (0.905)	-0.337 (0.228)	0.012 (0.190)
Capitalist parents	0.839** (0.422)	-0.108 (0.438)	0.153 (0.274)	0.270 (0.212)
<i>N</i>	1124	1124	876	876
$\rho$	-0.615*** (0.206)		-0.289*** (0.109)	
<i>Wald test (chi2)</i>	4.680		6.241	
<i>p-Value</i>	(0.030)		(0.012)	
<i>Log pseudo-likelihood</i>	-281.968		-540.324	

Note: E, employability and M, skill mismatch. Core region includes Beirut (the capital city) and adjacent Mount Lebanon. Periphery region includes South, Nabatieh, North, Akkar, Bekaa, and Baalbek. Primary and no education is the reference group for education. Statistical significance: \*=10%; \*\*=5%; \*\*\*=1%. Robust and residence area clustered standard errors are in parentheses.

**Table 7: Results by gender (Bivariate probit)**

	Male		Female	
	(i)	(ii)	(iii)	(iv)
	Pr(E=1)	Pr(M=1)	Pr(E=1)	Pr(M=1)
<i>Youth characteristics</i>				
Age: years	0.371*** (0.078)	-0.033 (0.021)	0.124*** (0.021)	-0.029 (0.022)
Marital status: single	-0.584** (0.262)	0.416** (0.181)	0.999*** (0.146)	0.178 (0.236)
Education: middle	-0.115 (0.770)	0.232 (0.255)	0.048 (0.387)	0.112 (0.391)
Education: secondary	-1.453* (0.759)	0.427* (0.254)	-0.224 (0.392)	0.364 (0.408)
Education: higher	-2.953*** (0.971)	1.100*** (0.281)	0.721* (0.392)	0.681* (0.410)
School type: public	-0.321 (0.210)	-0.005 (0.149)	0.091 (0.152)	0.136 (0.172)
Social class: upper & middle	-0.009 (0.197)	-0.258 (0.158)	0.044 (0.153)	0.599** (0.249)
Financial support from parents	-10.325*** (0.971)	0.424** (0.183)	-8.555*** (0.522)	-0.132 (0.242)
Socio-economic concern	0.092 (0.257)	-0.093 (0.170)	0.214 (0.159)	0.166 (0.244)
<i>Household characteristics</i>				
Household size: number of people	0.157** (0.071)	-0.096** (0.044)	0.025 (0.048)	-0.042 (0.053)
Father's education: none	-0.694** (0.316)	-0.502** (0.239)	0.361 (0.271)	0.207 (0.264)
Mother's education: none	-0.133 (0.373)	0.291 (0.241)	-0.091 (0.258)	-0.283 (0.278)
Capitalist parents	1.094** (0.498)	0.234 (0.305)	0.134 (0.282)	-0.047 (0.289)
<i>Residence area</i>				
Urban	-0.057 (0.229)	-0.049 (0.140)	0.074 (0.168)	-0.424** (0.205)
<i>Region</i>	Yes	Yes	Yes	Yes
<i>N</i>	1005	1005	995	995
$\rho$	-0.767*** (0.133)		-0.087 (0.145)	
<i>Wald test (chi2)</i>	9.809		0.359	
<i>p-Value</i>	(0.001)		(0.548)	
<i>Log pseudo-likelihood</i>	-329.693		-404.002	

Note: E, employability and M, skill mismatch. Primary and no education is the reference group for education. Statistical significance: \*=10%; \*\*=5%; \*\*\*=1%. Robust and residence area clustered standard errors are in parentheses.