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The impact of active labor market policies on the employment outcomes of youth graduates in the Tunisian governorates

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Abstract: In this paper, we analyze the impact of determinant factors on the employment of youth graduates in Tunisian governorates, and the effectiveness of active labor market policies. Our main objective is to identify the relationship between active labor market policies and professional insertion by considering regional disparity. We especially distinguish between the inland areas (the West areas) characterized by the highest youth unemployment rates, and the coastal areas (the East areas) where this problem is less important. This paper is different and novel. It is the first work that analyses youth employment by governorate using the database of the National Employment and Self Employment Agency (ANETI 2013) -relative to the Ministry of Vocational Training and Employment. We have found regional disparities in the access to active labor market policies and employment. More precisely, the youth have more chance to be employed if they have more scarce qualifications, have participated to any active labor market policy and are from the coastal regions of the country.

Keywords: active labor market policies, employability, higher education graduates, regional disparities, probit, Heckprobit.

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1. Introduction

Tunisia is largely considered as a country that has achieved good macroeconomic performances. Before the revolution, the economic growth rate reached an average of five percent a year. The growth was inclusive with a remarkable decline of poverty (from 32 percent to 16 percent between 2000 and 2010) and the income per capita of the lower 40 percent of the population has increased by one-third during the same period. In addition, Tunisia has also performed significantly on most development indicators. In fact, the improvement of the country's infrastructure, information and communication technology infrastructure, human development, education, etc. is always considered as the principal objective of the government. At the same time and included among the priorities of the Eleventh and Twelfth Development Plan, youth employment is seen as a mainly key for development challenge of the country.

However, by the last years, the economy has struggled to advance, growth is insufficient compared to other similar economies and the country is plagued by high unemployment. In fact, the rate of job creation and the quality of the jobs created remained low. The unemployment has been maintained at the same level since 2000s where the rate is around 14 percent, but the young between 18 and 29 years old rate is three times higher than the adult rate. Even more, 23.3 percent of youth graduates were considered as job applicants in 2010. These youth graduates have been affected by the lack of job creation in the Tunisian economy where the majority of the jobs created were in low-value-added activities or in the informal sector, in addition to the low wages and the no job security which did not respond to their aspirations.

In this sense, many educational, training and actives labor policies are adopted by the government in order to facilitate their professional insertion. Since the late seventies, these policies have promoted more job opportunities but the progress towards this objective is slow and therefore the effectiveness of such policies is to be questioned. As a result, young and educated individuals have envisaged a dramatic decrease of their employment at the moment where the situation reflects a structural mismatch between the demand for labor essentially unskilled and a growing supply of skilled labor (The outcomes of the university are doubled between 2002 and 2015 which are passed from 28565 to 58174 graduates according to the Statistics of the Ministry of Higher Education).

Until 1990s, the graduates' unemployment was negligible, but in 2012 over 30 percent is jobless (The part of graduates in the total of unemployed is around 28.5 percent and it differs from one region to another. This part is about 36.5 percent for the South East and 33.2 percent for the South West in 2010 and relatively low in the coastal area (North East is about 23.5 percent) and Great Tunis (24.8 percent) where it is easier to find a job for qualified persons). In fact, the profile of unemployed has changed significantly due to the post-independence education policy that leads over the last two decades to an increasing number of the higher graduates, but with a qualification in discordance with the demand of the labor market (The share of population aged 15 and over with tertiary level quadrupled from 3.7 percent to 12.3 percent between 1990 and 2010).

In reality, the economy, stuck in lower productivity activities, is unable to absorb this rapid increase of graduates in reason of a limited domestic private investment and foreign direct investment. In addition, the public sector, which in 2010 employed over 60 percent of these graduates, is found saturated facing the university outcomes. The persistence of high unemployment accompanied by the low quality of available jobs is one of the major factors of the social discontent that had lead to the Revolution.

The problem of unemployment has become increasingly important all over the regions after the revolution where the unemployment rate has reached 18.3 percent in 2011 (The unemployment rate is around 15.6 percent in 2016), but it is more serious for gender (In 2012, the unemployment rate of women is around 25.6 percent which is almost the double of the men rate (14.6 percent)) and in the inland areas where the revolution had triggered. The discrepancies of development between governorates are huge in that inland areas are more hit by the unemployment of youth graduates (47.7 percent in Gafsa) than the coastal areas (10.1 percent Ariana) (For more details see the appendix1: table 6 and the Tunisian map). The unemployment rate for youth between 15 and 29 is considerably higher in the inland regions (in 2010, 52.6 percent for Gafsa and 49.4 percent for Tataouine). It is also higher for graduates in the same governorates where Tataouine (56 percent in 2012), Sidi Bouzid (50.2 percent in 2012) and Gafsa (49.9 percent) present the highest level of this rate.

The situation of the Tunisian labor market, especially the situation of graduates and their professional insertion in different governorates with the distinction between inland and coastal area constitutes our main interest in this work. More precisely, the paper aims to address the following research questions: what are the determinants of the youth graduates employment in Tunisia and in each governorate? How these factors affect the professional insertion? Are the youth

graduates, who benefit from the employment government policies more likely to be integrated and to find a job? Do these factors have different effect from gender to governorate?

According to the existing literature, our paper is different and novel in several ways. First, we use the rich database of the National Employment Agency and Self Employment (ANETI) relative to the Ministry of Vocational Training and Employment. This micro-database includes all the job applicants who are enrolled in the National Employment Agencies in all the governorates and it contains much information about them. But it is not exhaustive in the sense that it does not consider all the unemployed persons. However, in order to find a job and to beneficiate from the labor government policies, these job applicants are obliged to enroll in these agencies.

In this study, we limit our analysis to the youth graduates. It is the first that makes use of this micro-database which contains the April 2013 status of 117 588 graduates enrolled in 2010 at all the Tunisian governorates agencies with women representing 67.27 percent. The high quality of the data and the large size of the sample lead to a detailed analysis of the graduates' professional insertion determinant factors and the effectiveness of government employment policies. Second, it is the first study in Tunisia that evokes the problem of regional unemployment and graduates professional insertion by distinguishing between coastal and inland areas. Particularly, for each governorate we try to assess the impact of each determinant factor on the professional integration and on the possibility to benefit from an active labor policy. Third, we study the correlation between the government policies and the professional insertion of youth graduates.

The remainder of the paper is organized as follows. Section 2 provides a brief survey of the existing literature on the determinant factors of the professional insertion. Section 3 describes the data and outlines the methodology adopted by this analysis. Section 4 analyzes the impact of the determinant factors on the professional insertion in Tunisia considering regional distribution of individuals with the objective to study the effectiveness of the employment policies considered by the government. Section 5 is a conclusion.

2. Literature review

The literature that evokes the youth graduates unemployment is rich. Many authors are interested in explaining this problem and its dynamic. They are also interested in highlighting the differences between countries and their experiences in resolving this problem (Boeri and Terrell, 2002 and Boeri, 2001). Many others are typically concerned by the professional insertion and the active labor market policies but few of them have analyzed the impact of the determinant factors on this process, and on a successful school-to-work transition (Super, 1980, 1988; Mason, 1985; Allard & Ouellette, 1995; Fournier et al, 1992; Limoges, 1987, 1991; Masdonati, 2007; Haynes et al, 2011).

Understanding the school-to-work transition process remains complex, fragmented and extended as time. It is due to the impact of various factors that play an important role in such a transition: sociological (The sociological factors: economic (Landry & Coll, 1990; Kotler & Caslione, 2009; Ristea et al, 2010), political (Langlois, 1985; Mason, 1985; Limoges, Lemaire & Dodier, 1987), cultural (Kuepie et al, 2013; Young, 1983), demographic and also geographic factors (Dockery, 2000; Baum et al, 2008)), psychological (The psycho-professional factors as the personal and professional identity (Zaccaria, 1965; Munley, 1977; Conger, 1973; Erikson, 1972, 1980; Friend, 1973; Knefelkamp & Slepitza, 1976; Lavoie, 1976; Ouellette, 1984; Pelletier & Bujold, 1984; Bujold, 1989)) and socio-psychological (The socio-psychological factors like family, friends, school (Bronfenbrenner, 1977; Guichard, 1993; Hotchkiss & Borow, 1984, 1990; Battagliola, 2001; Hanchane, 2002) and labor environment (Super, 1980; Young, 1983; Chen & Regan, 1985)) factors. Generally, works on the determinants of professional insertion do not consider all these dimensions. For example, Mason, 1985 identified many factors related to environment, family, education and also job, which can largely affect this insertion and can contribute to its success or its failure. These factors present only the sociological and socio-psychological characters while the psychological factors of the person who applies for a job are not introduced. However, the model of Allard and Ouellette (1990) incorporates all of these factors.

The professional insertion of youth in developed and developing countries has been the object of numerous researches and studies. Hanchane, 2002 studied the case of France by adopting a longitudinal approach and taking into account socio-demographic factors. His objective was to examine the diversity of the school-to-work transition paths considering as determinants the type of cohabitation with the parents and the access to life as couple, in addition to variables characterizing the accumulation of human capital in the original educational system and in the labor market. Another work in the same context had studied the determinants of the socio-professional insertion process of graduates in the labor market of Romania using a sample of master students (Ristea et al., 2010). The authors found that the success of the socio-professional insertion depends on quantitative and qualitative criteria. It depends also on the creation of

psycho-social conditions that allow people not only to be inserted but to keep themselves on the labor market. In a study relative to Morrocco and based on micro-data and using a multinomial Logit model, Bougroum et al, 2002 showed that the insertion of graduates is influenced by many socio-demographic factors (age, diploma, marital situation, etc), in that the individual trajectories of typical determinants help to throw light on certain mechanisms of selectivity at work in order to get the first job. In several countries, many other empirical studies using duration models have studied the determinants of unemployment and also those of the professional insertion. The objective is to explain their effects first off on the period of unemployment and, second, on the insertion process which leads to a regular job (Montmarquette et al, 1996; D'agostino & Mealli, 2000; Kupets, 2006; Haynes et al., 2011).

Nowadays, a growing literature is interested in the situation of the labor market in Tunisia and especially on the youth and graduates unemployment, but most of them have considered macroeconomic perspectives. Particularly, they have focused on the evolution of labor demand and supply and on the net effect of unemployment in a context of sustained growth (The World Bank, 2004; Boughzala, 2004; Nabli et al., 2007; Redjeb & Ghobentini, 2005). For example, Stampini and Verdier-Chouchane (2011) studied the dynamics of the youth labor market in Tunisia from 2005 to 2007. They showed that sustained economic growth would reduce youth unemployment over the next years and the highest potential to attend this objective is the growth of the private sector services. However, the investigation of the labor market characteristics reveals that young graduates experience long unemployment. The report of OECD 2015 presented also an overview on the unemployment in Tunisia and synthesized the different causes and consequences on the economic growth.

Another stream of literature focused on the evolution of unemployment and on the analysis of the labor market policies effect. Haoues et al, 2012 had analyzed the trends in youth employment and unemployment in Tunisia from 1984 to 2010 and evaluated the labor market reforms and active labor market policies adopted by the government in order to assess the effectiveness of these policies. They found that the economy suffers from unemployment and is unable to create jobs for these graduates. The government policies have done very little to improve the labor market conditions for the Tunisian youth. The report of ETF 2014 had provided also an overview of current employment policies and active labor market programs adopted by the government with the assessment of their results and outcomes. However, the recent study of David and Marouani (2013) presented a comparative analysis of the impact of international mobility in Tunisia and Jordan which are characterized by high unemployment and migrant populations. The authors shed light on the mechanisms through which emigration affects labor market outcomes. They found that the global crisis worsened the unemployment situation by increasing labor supply in both countries.

Other studies have typically considered the employment of university graduates. The Tunisian Ministry of Employment and Professional Integration of the Youth (ME) and the World Bank, 2008 had presented a study on the employment opportunities and the school to work transition for a sample of higher graduates in 2004. The results prove that unemployment is relatively high for this category especially for women. The recent study of Mouaddeb and Kriaa, 2016 had analyzed the determinants access to the graduates' first employment and the impact of the active labor market (the introductory traineeship in professional life SIVP1) on the employment quality and the salary. They found a raising positive effect of this active labor market policy on the access conditions to the first salary.

Nevertheless, the studies interested in analyzing the impact of determinant factors on the professional insertion and the effect of government policies of employment in developing countries, particularly in Tunisia, are rare and still absent when it concerns regional data. This idea is precisely what this empirical study went to pursue.

3. Data and methodology

To analyze the determinant factors of the professional insertion by governorate, we use the database of the National Employment Agency and Self Employment (ANETI) of the Ministry of Vocational Training and Employment. This micro-database contains varied information about the existing job applicants for the year 2010 and their status in April 2013 in all the agencies of the Tunisian governorates.

We estimate in a first model the probability of participating in the different active labor market policies considering biographical, training and regional characteristics (Model 1). The second model assesses the probability to get a job taking into account the hypothesis that the person would profit from an active labor market policy or would not. This hypothesis is taken on as a binary variable (The value of this variable takes 1 if the graduate gets a job and 0 otherwise) in a first version of this model (Model 2.1) and then introduced as a politomic (This variable takes

different value according to the type of the active policy) for each type of policy in the second version (Model 2.2). The third model is Heckprobit (This model is similar to the Heckman procedure to control for a sample selection bias) which is a probit sample selection model with an endogenous treatment of the active labor market policies. We estimate the probability to be employed rather than unemployed with the control of the probability that the individual is rather participating into active labor market policy (Model 3). It is a bivariate model with two separate probit model presenting correlated disturbances. This correlation is explained by the fact that two binary dependent variable are two interrelated decisions. Thus the first probit equation, estimating the probability to participate in one of the ALMPs, is completely observed, but we have only a selected or censored sample for the probit equation representing the probability to be employed.

The sample is composed of 117588 youth graduates where 67.27 percent are women and 60.36 percent have profited from the different active labor market policies (ALMP) proposed by the government but only 18.47 percent have been employed during the last three years. These active labor policies are: reintegration contract in the active life (CRVA), introductory traineeship in professional life of higher education graduates (SIVP), civil voluntarian contract (CVC), contract partially financed by the government (CPFG) and insertion contract of higher education graduates (CIDES) (See appendix 2, table 7 for more details about these active labor policies).

In this analysis three types of determinants are used: biographical, regional and training characteristics. The regional distribution of individuals is considered according two criteria: the governorates of residence and the governorates of registration at the ANETI office. In fact, statistics show that a high proportion of the population is resident on the District of Tunis (The district of Tunis includes the governorates of Tunis, Manouba, Ariana and Ben Arous) (19.20 percent) and the Center East (18.62 percent). The training characteristics refer to the diploma (We note that, according to the ANETI, higher technician certificates are considered on the labor market, at the same degree of qualification that the Bachelors of technology) and the fields of studies.

4. Results

The results of the estimated models are presented in terms of marginal effects. The finding in table 1 proves that model 1 analyzing the probability of participating at the ALMP (considered as a binary variable) and Model 2.1 of the employed that beneficiates of the ALMP (considered as a binary variable), present poor discriminate powers. Once the ALMPs are introduced as politomic variable (Model 2.2), the discriminate power and the explanatory power become good.

We refer to the endogenous treatment of the ALMP in order to highlight the real effects of the ALMPs on employment in the case of Tunisian graduates. The significance level of the coefficient atrho (Table 1) and the Wald test of independent equation suggest that the null hypothesis of no correlation between error term of main (employed) and selection (ALMP) equations is rejected for the entire sample. This means that the estimated probabilities to be employed without the sample selection control are biased. We can conclude, thus, that ALMP enhance the probability to be employed for each school title.

Table 1: Explanatory power of the estimated models

Model 1: Participation to ALPM		Model 2: Employed		Model 3:Heckprobit	
		ALMP (Binary variable) Model 2.1	All ALMPs Model 2.2		
log likelihood	-73423.7	-50485.	-29924.7	**log likelihood**	-108293.3
Pseudo R^2	0.1919	0.0703	0.4490	**Wald chi2(77)**	1614.95
Wald Chi2	3122.59	6653.86	34936.41	**Prob > chi2**	0.0000
Prob	0.0000	0.0000	0.0000	**Censored obs**	43942
Correctly classified(lstat)	61.86%	81.27%	92.28%	**Uncensored obs**	68335
Roc curve	0.6065	0.6895	0.8564	**Athrho**	**-2.203*** **
Sensitivity	92.51%	3.19%	66.64%		(0.0761)
Specificity	14.21%	99.38%	98.22%		

The second model (Model 2) presented in this table investigates the impact of the ALMPs and other graduates characteristics on the probability to be employed. Firstly, the ALMP is introduced as a binary variable where it takes the value of 1 if the graduate participates in any ALMP and 0 if not (Model 2.1). The result indicates that the youth that participates to one of the different policies has only 9.32 percent of chance to be employed. Secondly, the introduction of the different ALMPs

through polytomic variable demonstrates that only SIVP and CVC present significant effects on the probability to get a job (Model 2.2). A participant in a SIVP program has less 1.85 percent of chance to be employed compared to another graduate who did not take part in this ALMP. In fact, the SIVP is largely used in order to encourage firms to employ graduates permanently. However, usually participants are fired after the theoretical period of the SIVP training program. Compared to the SIVP, the graduate who benefits from a CVC has more chance to be employed. Also, a youth with CVC experience has more 81.3% chance to get a job compared to an active person without any participation in ALMP. In fact, this program (CVC) is designated to the higher education graduates who are first job seekers, and who have not benefited from SIVP program. Previously, the objective is to acquire design capacities and professional attitudes facilitating youth insertion in the labor market or a free-lance work. Hereby, participating in a CVC policy develops skills and competences for the youth, which makes the employer more encouraged for the recruitment, consequently enhancing employability.

Table 2 : ALMPs effects on professional insertion

	ALMP (Binary variable) Model 2.1	**All ALMPs Model 2.2**
Active labor market policy (binary variable)	**0.0932***** (0.00226)	
Active Labor Policy, ref Active		
CIDES/CRVA		-0.00716 (0.0395)
SIVP		**-0.0185***** (0.00367)
Civil volontarian contracts CVC		**0.813***** (0.00284)
Contracts partially financed by the government		0.0324 (0.0579)

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Our objective in this analysis is to identify the effects of several characteristics on the questions of the employability and the participation in active labor policies. The results are presented in table 3 and 4. Considering the biographical information (Table 3), men present less 1.8 percent chance to participate in any ALMP (Model 1). At the same time, they represent more 5.73 percent chance to be employed compared to women (Model 2.1 and 2.2). If we consider the different types of ALMP, the coefficient becomes non significant. The correction of the sample selection (Model 3) increases the probability to be employed to 6.47 percent. Oldest graduates present a negative probability to participate in any ALMP (-1.05 percent). This category presents also a weak probability to be employed (0.3 percent), which is confirmed in the Model 3 (0.66 percent). Moreover, married graduates have less chance to participate in any ALMP compared to the single (-0.72 percent) (Model 1). They also present a negative probability to be employed compared to single persons while considering ALMP as binary (Model 2.1) or politomic variable (Model 2.2) (respectively - 6.10 percent and -1.84 percent). However, the correction of sample selection (Model 3) makes this probability positive but remains weak.

Considering the training characteristics (Table 4), results show that old graduates present less probability to benefit from any ALMP (-2.47 percent) (Model1) and to be employed (-2.34 percent) (Model2). The correction of sample selection (Model 3) attenuates this negative effect especially for the probability to be employed (- 0.74 percent). School titles show a net correlation between scarcity of the diploma and the participation in the ALMP. The graduate architects present significant coefficients with a positive probability to participate in ALMP of 21.7 percent (Model 1) and a probability to be employed of 21.3 percent (Model2). Considering the selection sample problem the school title has no significant effect (Model3). Graduate Pharmacists and technicians present significant and positive probabilities to participate in ALMP (respectively 34.6 percent and 5.33 percent) and to be employed (respectively 43.6 percent and 2.74 percent). The positive effect persists with the bias selection treatment in the case of graduate pharmacists but it becomes negative for the graduates Technicians. Graduate Engineers present positive probabilities for each model but probabilities slowed down in the last model.

Table 3: Impact of biographical characteristics on ALMPs participation and professional insertion

	Model 1: Participation to ALPM	Model 2: To be employed		Model 3:Heckprobit		
		ALMP (Binary variable) Model 2.1	All ALMPs Model 2.2	ALMP (Binary variable)	Employed	Marginal effects
Man (Ref :Women)	-0.018***	0.057***	-0.000502	-0.0821***	0.172***	0.0647 ***
	(0.00337)	(0.00272)	(0.00282)	(0.00856)	(0.00894)	(0.000)
Age	-0.0105***	-0.003***	-0.0036***	-0.00263***	-0.00138	0 .00661 ***
	(0.000600)	(0.000469)	(0.000531)	(0.000422)	(0.00105)	(0.000)
Marital statut ref (single person)						
Divorced	0.00691	-0.0320	0.00224	-0.0161	-0.0619	-0.0400
	(0.0451)	(0.0314)	(0.0401)	(0.113)	(0.116)	(0.392)
Married	-0.0720***	-0.061***	-0.0184***	-0.198***	0.0371***	0 .0050***
	(0.00516)	(0.00341)	(0.00396)	(0.0128)	(0.0140)	(0.373)
Widower	-0.0788	-0.120***	-0.0205	-0.251	-0.295	-0.1399
	(0.0908)	(0.0410)	(0.0721)	(0.231)	(0.271)	(0.189)

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 4: Impact of training characteristics on ALMPs participation and professional insertion

	Model 1: Participation to ALPM	Model 2: To be employed		Model 3:Heckprobit		
		ALMP (Binary variable)	All ALMPs	ALMP (Binary variable)	Employed	Marginal effects
Year of diploma	-0.0247***	-0.023***	-0.0125***	-0.0467***	-0.0319***	-0.00744***
	(0.000858)	(0.000624)	(0.000709)	(0.00163)	(0.00226)	(0.00103)
Diploma, reference Bachelor and Licence						
Pharmacist	0.346***	0.436***	0.0128	1.410***	0.452***	0.1714*
	(0.0250)	(0.0602)	(0.0526)	(0.265)	(0.160)	(0.056)
Other title	0.232***	0.0901	-0.0654	0.546*	-0.150	-0.0730
	(0.0899)	(0.0916)	(0.0409)	(0.329)	(0.282)	(0.1114)
Architecte	0.217***	0.213***	0.157**	0.619***	-0.0388	-0.0169
	(0.0416)	(0.0560)	(0.0642)	(0.159)	(0.141)	(0.763)
Engineer	0.118***	0.144***	0.0594***	0.282***	0.0645***	0.0268*
	(0.00859)	(0.00922)	(0.00945)	(0.0250)	(0.0246)	(0.01)
Technician diploma	0.0543***	0.0274***	0.0288***	0.164***	-0.0686***	-0.0203*
	(0.00398)	(0.00321)	(0.00361)	(0.0104)	(0.0104)	(0.0042)
Postgraduate degree	-0.0162**	0.0191***	-0.00219	-0.0683***	0.156***	0.0522*
	(0.00785)	(0.00683)	(0.00714)	(0.0198)	(0.0210)	(0.0083)
Higher technician certificate (BTS)	-0.0598***	0.0861***	0.0299***	-0.184***	0.271***	0.1043*
	(0.0114)	(0.0102)	(0.0111)	(0.0229)	(0.0237)	(0.0113)
Undergraduate level	-0.00343	0.102***	0.0299***	0.0125	0.177***	0.0753*
	(0.0108)	(0.00987)	(0.00957)	(0.0276)	(0.0277)	(0.0108)
Doctorate	0.165	0.592***	0.199	0.397	0.608	0.2157
	(0.201)	(0.215)	(0.138)	(0.687)	(0.701)	(0.2292)
Doctor of Medicine	0.113	0.126*	-0.0808**	0.199	0.0963	0.0243
	(0.0736)	(0.0670)	(0.0352)	(0.218)	(0.200)	(0.760)
Veterinarian		0.396*	0.436	4.648	0.208	0.0801
		(0.214)	(0.280)	(133.2)	(0.572)	(0.2208)

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

However, BTS and postgraduates present negative probabilities to participate in ALMP (respectively -5.98 percent and -1.62 percent) (Model 1) while they have more chance to be employed (respectively 8.6 percent and 1.91 percent) (Model 2.1). Coefficients increase after the correction of sample selection (respectively 10.43 percent and 5.22 percent) (Model 3). PhD, doctor of medicine and veterinarian present no significant effects on the probabilities to participate in any ALMP (Model 1). But, they have more chance to be employed when ALMP is introduced as a binary variable (respectively 5.92 percent, 12.6 percent and 39.6 percent) (Model 2). The correction of the sample selection presents no significant effect (Model 3). Only undergraduates present no significant effect on the probability to participate in ALMP (Model1), but a positive and significant probability to be employed (Model 2) decreases from 10.2 percent to 7.53 percent in the Model 3.

In order to take into account the totality of educational characteristics, we integrate all the 50 fields proposed by the system (See appendix 2 table 8 for the estimated results of the models). The analysis shows that 29 fields present significant coefficients of the probabilities to participate in an ALMP and to be employed. Among the 29 fields only 5 (wood and furniture, medicine, paramedical specialties, textile and clothing and socio-cultural education) have positive coefficients which reveals more chance to participate in any ALMP comparing to the reference (Management and accounting) and only 3 of them have a chance to be employed (medicine 17.4 percent, paramedical specialties 5 percent, textile and clothing 6.83 percent). But these coefficients become no significant with treatment effect model (Model 3). However, the other fields present negative coefficients.

For the 29 fields with significant probabilities to be employed without the treatment effects (Model 2.1 and 2.2) only 11 fields have positive and significant effects on the employability of graduate youth (Medicine, paramedical specialties, textile and clothing, divers, electricity and electronics, hotels and tourism, transport and communication, hair and beauty, metal construction, mechanical, textile and leather) which implies that their chances to find a job are more important than the 18 fields that present negative coefficients.

The endogenous treatment considering the marginal effects improves the result of certain fields with a change of their coefficients' sign from negative to positive (Legal sciences, soil sciences and specialties annexes, foreign languages and translation, chemistry, math and physics, history and geography, Islamic sciences). This finding means that the participation in ALMP can help to improve graduates' employability. Graduates from these fields are the most exposed to unemployment and find many difficulties to be inserted. So to benefit from an ALMP allows them to accumulate other qualifications requested by the labor market which can facilitate their integration. At the same time, many other fields have improved the significance of their coefficients which means that their employability can be enhanced by considering the effect of ALMP (Agribusiness studies, natural and biological sciences, economics and pharmacy). But certain fields have lost the significance of their coefficients so that these policies have no effect on graduates' employability (Medicine, paramedical specialties, textile and clothing, philosophy, sociology and psychology, hotels and restaurants, agronomy and assimilated, IT discipline, architecture and specialties annexes, Arab language, rural engineering, hair and beauty, metal construction).

In conclusion, two categories of fields are signalized: the fields with high employability where graduates (Medicine, paramedical specialties, textile and clothing, metal construction, IT discipline, Architecture and specialties annexes, rural engineering, hair and beauty, hotels and restaurants, agronomy and assimilated) do not need ALMP in order to find a job and fields with abundant numbers of graduates who find many difficulties to be inserted (Philosophy, sociology and psychology, Arab language).

Table 5 presents the estimated results considering regional characteristics. Graduates from regions with higher unemployment rate may have more chance to participate in any ALMP (Model 1) which improves their employability (Model 3). By considering the region of residence, we find that being from the Center East and the South East can enhance the chance to benefit of any ALMP compared to the Center West and the South West (Model 1). For the probability to be employed, graduates from the South present negative coefficients (Model 2) which change the sign with treatment effect only for the South East (Model 3). Youth from the Center West presents positive and significant coefficients (Model 2) which becomes negative with the treatment effects (Model 3). Being from the coastal areas particularly from the Center East preserves the opportunity to get a job even with the treatment effects. However, the estimated coefficients of the employment office region are no significant. This finding confirms the multi-correlation between the regional disparity of the economic activity, ALMP, and the employability.

Table 5: Impact of regional characteristics on ALMPs participation and professional insertion

	Model 1: Participation to ALPM	Model 2: To be employed		Model 3:Heckprobit		
		ALMP (Binary variable) Model 2.1	All ALMPs Model 2.2	ALMP (Binary variable)	Employed	Marginal effects
Regional unemployment rate	0.00245***	0.0010***	0.00149***	0.00567***	-0.00229**	0.00567***
	(0.000358)	(0.00027)	(0.000290)	(0.000926)	(0.000945)	(0.000926)
Region of residence ref District of Tunis						
North East	-0.00461	-0.00714	-0.00279	-0.00663	0.00350	-0.00663
	(0.00571)	(0.00437)	(0.00488)	(0.0147)	(0.0151)	(0.0147)
North West	-0.00120	-0.000849	0.00458	-0.00293	0.00294	-0.00293
	(0.00508)	(0.00391)	(0.00419)	(0.0131)	(0.0133)	(0.0131)
Center East	**0.0216*** **	-0.00556	**0.0135*** **	0.0257*	-0.0444***	**0.0257***
	(0.00516)	(0.00400)	(0.00448)	(0.0133)	(0.0136)	(0.0133)
Center West	**-0.0151*** **	**0.0107*** **	-0.00614	-0.0477***	0.0657***	**-0.0477*** **
	(0.00503)	(0.00393)	(0.00418)	(0.0129)	(0.0131)	(0.0129)
South East	**0.0291*** **	**-0.018*** **	0.000639	0.0769***	-0.115***	**0.0769*** **
	(0.00537)	(0.00405)	(0.00443)	(0.0141)	(0.0144)	(0.0141)
South West	**-0.0155*** **	**-0.021*** **	**-0.0225*** **	-0.0191	-0.0520***	-0.0191
	(0.00593)	(0.00433)	(0.00459)	(0.0151)	(0.0156)	(0.0151)
Region of the Employment Office , ref district of Tunis						
North East office		-0.00314	0.00620		-0.0124	-0.0045
		(0.00426)	(0.00476)		(0.0102)	(0.283)
North West office		**0.00883** **	0.00734		0.0174*	0.0072
		(0.00422)	(0.00454)		(0.00984)	(0.073)
Center East office		0.00540	**0.00734***		0.00683	0.0028
		(0.00354)	(0.00384)		(0.00826)	(0.407)
Center West office		0.00191	0.00317		0.00113	0.0001
		(0.00401)	(0.00431)		(0.00946)	(0.975)
South East office		**0.0102** **	0.00242		0.0159	0.0067
		(0.00448)	(0.00483)		(0.0102)	(0.107)
South West office		-1.77e-05	0.000824		-0.00764	-0.0029
		(0.00398)	(0.00429)		(0.00931)	(0.436)
Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1						

5. Conclusion

Over the last decade, many developed and developing countries have realized the persistence of unemployment. This situation has attracted the attention of economists and policymakers. Nowadays, the problem of unemployment becomes more serious because of structural characteristics. In order to tackle this phenomenon it is essential to study the explaining factors. The professional insertion is difficult due to the pressure of environmental factors such as economic evolution, new forms of employment, the increase of youth and graduates unemployment, and the length of the school-to-work transition. This process becomes complex and dependent on the individual skills and qualities (OCDE, 2000).

The estimated results prove that the access to ALMP and its effectiveness depend mainly on the school title, the field of study, and the region of residence. The treatment effect confirms the positive correlation between the ALMP and employability. For certain fields, ALMP can sustain the employability of youth graduates. Considering regional characteristics, youth from the coastal area, where economic activities are developed, can easily benefit from ALMP and they present more chance to be employed which is not the case for youth from inland area. In fact, the region of the employment offices has no significant effects both on participating in ALMP and getting a job. In

conclusion, regional disparities have a large effect on the participation in ALMP and on the employability of youth which depends on skills characteristics.

Appendix A. Supplementary material

Supplementary data associated with this article can be found, in the online version, at https://dx.doi.org/10.14254/jems.2017.2-2.7.

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Appendix 1

Tunisian Map

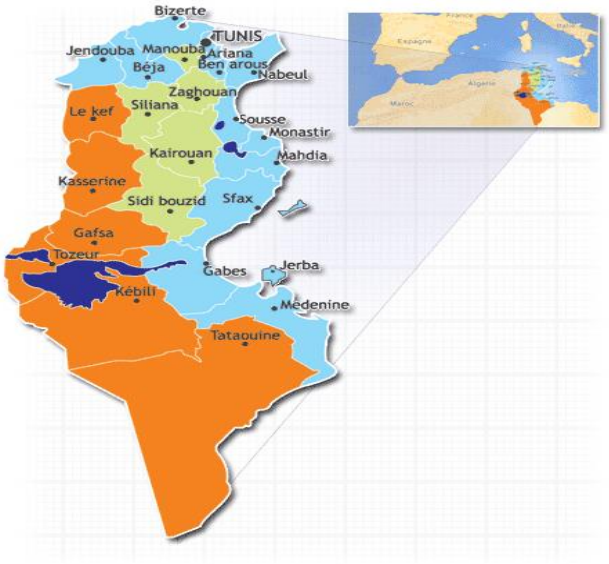

Table 6: Unemployment rates in Tunisia by governorate (2010)

	Graduates unemployment rate 2010 (%)	Unemployment rate 2010 (%)
Tunis	13.6	14.2
Ariana	10.9	10.8
Ben Arous	15.2	12.2
Mannouba	24.8	15.3
District of Tunis	16.1	13.1
Nabeul	24.1	11.4
Zaghouan	11.5	4.9
Bizerte	22.3	12.8
North East	19.3	9.7
Béja	31.3	11.5
Jendouba	40.1	17.7
Kef	27.9	12.4
Siliana	27.9	15.6
North West	31.8	14.3
Sousse	19.6	13.0
Monastir	18.7	6.1
Mahdia	28.8	12.2
Sfax	18.5	7.4
Center East	21.4	9.7
Kairouan	37.9	10.6
Kasserine	38.9	20.7
Sidi Bouzid	41.0	14.7
Center West	39.3	15.3
Gabès	39.4	18.1
Médenine	32.6	13.9
Tataouine	39.1	23.6
South East	37.0	18.5
Gafsa	47.4	28.3
Tozeur	42.8	14.5
Kébili	24.0	17.0
South West	38.1	19.9
Total	**23.3**	**13.0**

Appendix 2

Table 7: Summary of ALMPs considered in the study

ALMP	Objectives	Targeted population	Duration (months)	Stipend/month
SIVP	Acquire skills that facilitate professional insertion in the private or public sector.	Tunisian graduates seeking for a first job.	24	The government contribution =150 TND (US$102) with Social security coverage.
CVC	Improve beneficiaries' employability and facilitate insertion into the workforce through voluntary internships and part-time work in community services.	higher education graduates and first time job seekers.	12	The government contribution = 200TND (US$136) with Social security coverage.
CRVA	Allow workers who lost their jobs to obtain new skills, meeting the requirements of a job offer previously identified in a private firm.	Unemployed persons for technical or economic reasons and with at least 3 years' experience in the same firm.		The government contribution = 200TND (US$136) with Social security coverage and up to 30% of transportation costs.
CPFG (PC50)	Encourage private firms recently created and located in less developed areas to hire higher education graduates by paying half the wage for 12 months.	Higher education graduates and first-time job seekers.		The government contribution = 50 percent of wages of newly hired employees for a year, up to 250 TND (US$170). Possibility of training programs provided by ANETI.
CIDES	Obtain professional skills by alternating between a private and a public firm or private training program agreed by the beneficiary, the firm and ANETI.	Graduates of higher education who have been unemployed for more than two years since obtaining diploma.		The government contribution = 150 TND (US$102)

Table 8: Fields of studies impacts on ALMPs participation and professional insertion

	Model 1: Participation to ALPM	Model 2: To be employed		Model 3:Heckprobit		
		ALMP (Binary variable)	All ALMPs	ALMP (Binary variable)	Employed	Marginal effects
Fields of study, ref Management and accounting						
Wood and furniture	0.153*	0.0406	0.130	0.403	-0.121	-0.0590
	(0.0832)	(0.0805)	(0.106)	(0.278)	(0.267)	(0.1067)
Medicine	0.123***	0.174***	0.106**	0.342**	0.149	0.0576
	(0.0430)	(0.0431)	(0.0469)	(0.134)	(0.116)	(0.0456)
Paramedical specialties	0.0720***	0.0502***	-0.0120	0.213***	-0.0155	-0.0025
	(0.0128)	(0.0108)	(0.00977)	(0.0352)	(0.0330)	(0.0133)
Textile and clothing	0.0483**	0.0683***	0.0756***	0.144**	0.0796	0.0218
	(0.0230)	(0.0208)	(0.0261)	(0.0596)	(0.0607)	(0.0253)
Sociocultural education	0.0275**	0.0109	-0.0187**	0.0952***	-0.0428	-0.0164
	(0.0112)	(0.00864)	(0.00819)	(0.0292)	(0.0289)	(0.0117)
Divers	-0.0941***	0.129***	0.0546*	-0.210***	0.326***	0.1184*
	(0.0325)	(0.0303)	(0.0283)	(0.0797)	(0.0862)	(0.0332)
Legal Sciences	-0.0906***	-0.0134***	-0.00514	-0.246***	0.190***	0.0595*
	(0.00699)	(0.00511)	(0.00565)	(0.0167)	(0.0175)	(0.0071)
Philosophy, sociology and psychology	-0.0834***	-0.044***	-0.0132	-0.219***	0.0600*	0.0061
	(0.0127)	(0.00849)	(0.00997)	(0.0314)	(0.0332)	(0.0135)
Hotels and restaurants	-0.0810***	-0.041***	-0.0135	-0.176***	0.00876*	-0.0032
	(0.0129)	(0.00854)	(0.00963)	(0.0318)	(0.0333)	(0.0136)
Soil Science and specialties Annexes	-0.0788***	-0.040***	-0.0121*	-0.189***	0.0985***	0.0313*
	(0.00951)	(0.00631)	(0.00725)	(0.0235)	(0.0242)	(0.0098)
Agronomy and assimilated	-0.0777***	-0.056***	-0.00939	-0.151***	0.00811	0.0003
	(0.0200)	(0.0112)	(0.0144)	(0.0488)	(0.0489)	(0.0198)
Agribusiness studies	-0.0649***	-0.0134	-0.00622	-0.130***	0.109***	0.0423*
	(0.0144)	(0.00998)	(0.0109)	(0.0357)	(0.0357)	(0.0143)
Foreign Languages and Translation	-0.0585***	-0.034***	-0.0153***	-0.149***	0.0707***	0.0170*
	(0.00576)	(0.00413)	(0.00461)	(0.0137)	(0.0144)	(0.0061)
Natural and biological sciences	-0.0559***	0.000643	0.00306	-0.112***	0.118***	0.0451*
	(0.0132)	(0.0101)	(0.0108)	(0.0330)	(0.0338)	(0.0135)
Information Science	-0.0347***	0.00128	-0.00179	-0.0707**	0.0585*	0.0187
	(0.0121)	(0.00884)	(0.0101)	(0.0299)	(0.0301)	(0.0122)
IT discipline	-0.0340***	-0.031***	-0.0216***	-0.0734***	-0.0162	-0.0037
	(0.00524)	(0.00366)	(0.00403)	(0.0133)	(0.0135)	(0.0054)
Architecture and specialties Annexes	-0.0335***	-0.045***	-0.0221***	-0.0704**	-0.0314	-0.0192
	(0.0114)	(0.00751)	(0.00854)	(0.0286)	(0.0294)	(0.0120)
Economics	-0.0235***	-0.00802	0.00553	-0.0491**	0.0590***	0.0153***
	(0.00842)	(0.00615)	(0.00706)	(0.0210)	(0.0211)	(0.0086)
Electricity and electronics	-0.0178**	0.0171***	0.0121*	-0.00893	0.0622***	0.0214**
	(0.00881)	(0.00651)	(0.00729)	(0.0207)	(0.0207)	(0.0089)
Arabe language	-0.101***	-0.066***	-0.0147*	-0.291***	0.0652**	-0.0003
	(0.0106)	(0.00646)	(0.00817)	(0.0256)	(0.0281)	(0.0116)
Rural Engineering	-0.112***	-0.0397**	-0.0141	-0.286***	0.0853	0.0298

	(0.0265)	(0.0170)	(0.0201)	(0.0659)	(0.0682)	(0.0273)
Chemistry	-0.113***	-0.037***	-0.0162*	-0.255***	0.145***	0.0533*
	(0.0114)	(0.00754)	(0.00863)	(0.0279)	(0.0291)	(0.0117)
Math and physics	-0.116***	-0.067***	-0.0251***	-0.298***	0.110***	0.0267*
	(0.00798)	(0.00493)	(0.00600)	(0.0193)	(0.0213)	(0.0088)
History and geography	-0.122***	-0.056***	-0.00401	-0.343***	0.124***	0.0250**
	(0.00949)	(0.00600)	(0.00765)	(0.0230)	(0.0251)	(0.0103)
Fishing	-0.149**	0.000120	0.0315	-0.320**	0.326**	0.1282**
	(0.0619)	(0.0455)	(0.0501)	(0.157)	(0.160)	(0.0595)
Forest	-0.164***	-0.0147	0.0488	-0.380***	0.247**	0.0869**
	(0.0463)	(0.0320)	(0.0387)	(0.115)	(0.118)	(0.0459)
Hydrolic engineering	-0.189***	-0.0317	-0.0222	-0.425***	0.272**	0.1020*
	(0.0394)	(0.0266)	(0.0303)	(0.0996)	(0.107)	(0.0410)
Hotels and tourism	-0.190***	0.309***	0.131	-0.423***	0.476***	0.1720*
	(0.0617)	(0.0666)	(0.0805)	(0.156)	(0.172)	(0.0613)
Islamic sciences	-0.267***	-0.078***	-0.0604**	-0.682***	0.356***	0.1216*
	(0.0383)	(0.0243)	(0.0238)	(0.101)	(0.118)	(0.045)
Transport	-0.0237	0.00751	0.0237	-0.0182	0.0469	0.0149
	(0.0380)	(0.0284)	(0.0331)	(0.0955)	(0.0995)	(0.0405)
Transport and communication	-0.0220	0.0317***	0.0122	-0.0257	0.113***	0.0458*
	(0.0140)	(0.0110)	(0.0119)	(0.0354)	(0.0353)	(0.0140)
Artisanat	0.0476	-0.0317	-0.0460*	0.0902	-0.0493	-0.0216
	(0.0432)	(0.0315)	(0.0256)	(0.116)	(0.117)	(0.0472)
Arts and graphics	-0.0181	-0.047***	-0.0167	-0.0104	-0.107***	-0.0473*
	(0.0143)	(0.00948)	(0.0110)	(0.0362)	(0.0373)	(0.0151)
Other fields of studies	-0.0186	-0.0470	-0.00693	-0.0439	-0.0991	-0.0431
	(0.0591)	(0.0364)	(0.0430)	(0.149)	(0.151)	(0.0609)
Building studies	-0.00308	-0.080***	-0.0314	0.0323	-0.171**	-0.0720*
	(0.0325)	(0.0163)	(0.0223)	(0.0815)	(0.0853)	(0.0349)
Hair and Beauty	-0.0308	0.511*	0.398	0.0621	0.659	0.2513
	(0.214)	(0.267)	(0.341)	(0.570)	(0.633)	(0.1937)
Metal construction	0.0665	0.106**	0.0793	0.223*	0.113	0.0421
	(0.0481)	(0.0453)	(0.0499)	(0.133)	(0.136)	(0.0541)
Leather and footwear	0.0827	-0.0120	0.0844	0.222	-0.162	-0.0723
	(0.0776)	(0.0568)	(0.0793)	(0.221)	(0.220)	(0.0876)
Livestock and related	-0.0500	-0.0868***	-0.0341	-0.0535	-0.156*	-0.0673**
	(0.0351)	(0.0164)	(0.0228)	(0.0876)	(0.0875)	(0.0350)
Office jobs	-0.0132	-0.00187	0.00896	-0.0338	-0.0136	-0.0048
	(0.0183)	(0.0134)	(0.0166)	(0.0470)	(0.0484)	(0.0194)
Civil engineering and building related	0.0214	-0.0200**	-0.00558	0.0516	-0.0948***	-0.0370*
	(0.0137)	(0.00908)	(0.0107)	(0.0357)	(0.0346)	(0.0138)
Mechanical	-0.0149	0.0553***	0.0243***	-0.0162	0.162***	0.0625*
	(0.00962)	(0.00763)	(0.00799)	(0.0238)	(0.0235)	(0.0094)
General Mechanical	-0.00738	0.0338	0.0283	0.00299	0.108	0.0371
	(0.0350)	(0.0273)	(0.0329)	(0.0886)	(0.0925)	(0.0375)
Dentistry	0.0649	0.200	-0.0276	0.201	0.243	0.0968
	(0.151)	(0.153)	(0.107)	(0.421)	(0.413)	(0.1574)

Veterinary Medicine	0.0109	0.0311	-0.00546	0.00256	0.0125	0.0016
	(0.0786)	(0.0591)	(0.0675)	(0.206)	(0.196)	(0.0782)
Pharmacy	-0.0265	0.0208	-0.0108	-0.0492	0.111**	0.0462*
	(0.0173)	(0.0135)	(0.0138)	(0.0433)	(0.0437)	(0.0174)
Biology	-0.0172	0.0258	0.00489	-0.0297	0.0933	0.0410
	(0.0354)	(0.0273)	(0.0241)	(0.0900)	(0.0891)	(0.0353)
Food and chemical products	-0.117	0.0523	0.0243	-0.288	0.176	0.0614
	(0.0727)	(0.0589)	(0.0518)	(0.177)	(0.190)	(0.0751)
Vehicle repair and amo gear	0.0197	-0.0511	-0.00467	0.0364	-0.118	-0.0548
	(0.0611)	(0.0381)	(0.0515)	(0.154)	(0.163)	(0.0654)
Health	-0.0468	0.0746	-0.0676**	-0.0701	0.0333	0.0129
	(0.0646)	(0.0561)	(0.0336)	(0.162)	(0.169)	(0.0684)
Textile and leather	-0.0109	0.0839***	0.0437**	-0.0117	0.194***	0.0752*
	(0.0203)	(0.0172)	(0.0176)	(0.0514)	(0.0506)	(0.0198)
Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1						

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