

Analysis of the determinants of labor market integration in Algeria: Gender approach

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Abstract:

The objective of this study is to examine the disparities in employment participation by gender in Algeria. Our work contributes to the integration of the gender approach in the labor market. We opted for a multinomial logistic estimation, in order to determine the main factors in the integration of men and women into employment, based on household survey data carried out in 2021. The results of our research indicate that the possibility of having a job as an employee or self-employed, relative to the unemployed modality is determined by socioeconomic variables, the place of residence and human capital. These results imply the need to carry out gender equality policies in terms of access to employment in Algeria.

Key Words: Labor market, gender, Determinants, employment, Algeria.

JEL Classification: J44, J71

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1. Introduction

Today, employment is considered one of the main socio-economic variables strongly affecting the quality of well-being of individuals. Indeed, it constitutes a source of income which encourages consumption, savings and guarantees, through the collaborative action of individuals, social, inclusive and sustainable economic development. Thus, female employment in particular appears to be an inevitable component of sustainable development, after having been considered as a neutral element in economic analyzes linked to the labor market.

According to a recently report published by the World Bank, gender differences are significant in the labor market, notably in the most developed countries. Thus, women have only two thirds of the rights granted to men (BM, 2024, p. 1). In recent decades, the employment rate² of women around the world has accelerated significantly (68.1% of women compared to 75.7% of men (ILO, 2022)). However, the international labor organization ILO has implemented a new indicator which is the employment deficit, estimated globally at 9.3% for men compared to 13.7% for women. This indicator takes into consideration all unemployed individuals who wish to work. So, the criteria used to define unemployment tend to exclude many women. At the same time, the disparity between unemployment (5% for men versus 5.3% for women) and the employment deficit (17.4% for men versus 24.3% for women) is greater for low-income countries, particularly among women (ILO, 2024, p. 2). In Algeria, the female activity rate³ remains too low (18% for women compared to 72% for men) and the unemployment rate for women (21.5%) is more than double that of men (10.4%) (ILO, 2022). However, the female activity rate is continuously growing, particularly in urban areas thanks to women's education and the decline⁴ in fertility (Abramo & Valenzuela, 2005). The existence of jobs reserved for men (Building and public works and hydraulics, agriculture, etc.), and others allocated to women (education, health, traditional crafts) explains the segmentation of the Algerian labor market in relation to the gender of the individual. This segmentation is mainly due to socio-cultural traditions and family and domestic responsibilities linked to women.

The objective of this study is to examine the disparities in employment participation by gender in Algeria. This work contributes to the integration of the gender approach in the labor market by specifying the practical needs of men and women in the labor market. In order to achieve our objective, it is imperative to ask ourselves the following main question: What are the main determinants of the access of individuals (men, women) to the labor market in Algeria?

Other subsidiary questions deserve reflection, namely: What is the concept of gender in the economy? What is the current state of employment by gender in Algeria? What are the determining factors in the participation of men and women in employment?

² -Employment rate (employment population ratio): Ratio of the employed population to the working age population (ONS, 2013, p. 2).

³ -The activity rate is the ratio between the active population (employed + unemployed) and the population of working age (15 years and over) (ILO, 2008, p. 1).

⁴ -The fertility rate is defined as the average number of living children born to a woman (Capul & Garnier, 1996, p. 123). According to the ONS, this rate increased from more than 7 in the 1960s and 1970s, to 3.45 in 1995, to 2.62 in 2010 and to 2.8 in 2022.

This study is based on three main hypotheses listed as follows:

Hypothesis 1: It is assumed that the individuals (women, men) who constitute the supply of labor force have decided on the one hand, to participate in the labor market and on the other hand, they have the choice to accept or refuse the proposed job offer. However, we recognize the relevance of the gender approach in determining the integration of active people into the labor market.

Hypothesis 2: Referring to the standard theory of human capital (Becker, 1971), we admit the existence of a causal relationship between the accumulation of human capital and the possibility of obtaining a job. Furthermore, we support this hypothesis by the crucial importance given to the modality "individual characteristic of the job seeker" such as gender, age, marital status, level of education and place of residence which is considered as one of the main determining factors of the job supply (the modern theory of job prospecting: job search).

Hypothesis 3: We first assume that the comparison between the two groups (female and male), in terms of equal access to employment, is carried out in the same status and the same type of employment. Then, we admit the independence of the alternative variables (the explanatory variables of our model).

The methodological approach followed in this work is a hypothetico-empirico-inductive approach. For this purpose, we use data from the national survey (ONS : Office for national statistics) and local survey carried out in Bejaia. The econometric study was carried out on a sample of 537 individuals, taken from the household survey carried out between February and September 2021 in Bejaia which is a region located in the northeast of Algeria.

Our article is subdivided into a few sections. The first presents a general introduction. The second section expresses the conceptual framework of the gender approach and the literature review. Then, section three indicates the current state of employment by gender in Algeria and the fourth section presents and analyzes the results obtained. Finally, we present in the fifth section the conclusion which constitutes a synthesis of the main results obtained and which shares possible recommendations.

2. Conceptual framework of the gender approach and review of the literature

In this section, we present the concept of the gender approach, then discuss a review of the literature.

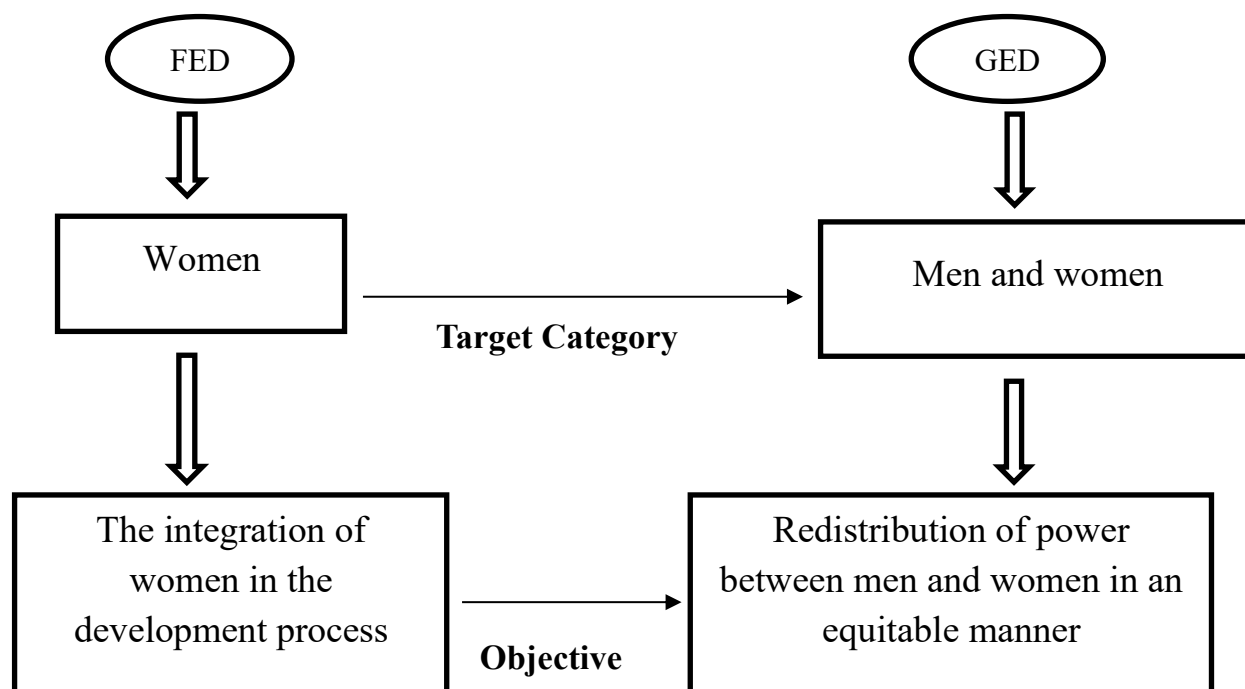
2.1 Conceptual framework of the gender approach

Unlike biological sex, gender in English refers to "masculine" and "feminine" social roles as well as female-male social relations (DDC, 1998, p. 2). Gender refers to a dynamic notion; in fact, multiple social, economic, ecological and cultural transformations are changing socio-economic relations between men and women.

In July 1997, the United Nations Economic and Social Council (ECOSOC) defined the concept of gender mainstreaming as follows: "Gender mainstreaming involves assessing the implications for women and men of any action plan including legislation, procedures or programs in all areas and at all levels. This strategy makes it possible to integrate the concerns and experiences of women and men into the design, implementation, monitoring and evaluation of procedures and programs in all political, economic and social spheres so that they benefit equally and that the current inequality is not perpetuated." (CNES, 2005, p. 15).

According to the Directorate of Development and Cooperation (1998), to apply a gender policy, there is no need to develop and introduce new methods. The gender dimension must be integrated into the methods and instruments that already exist. The notion of gender or balanced development between women and men is considered as a development strategy, where we have moved from the integration of women in development (IFD) to Gender and Development (GED). As a result, gender analysis is not only a conceptual approach but rather a practical and relational one.

Diagram. 1. Transition from the women and development approach (FED) to the gender and development approach (GED)



Source: established by the authors using the site: www.Adequations.org, November 2009, p. 1.

2.2 review of the literature

In this literature review, we attempt to examine themes relating to gender and inequalities in access to employment, the explanatory theories of integration into employment by gender and the factors of integration of men and women to the employment market in Algeria.

2.2.1 Gender and inequalities in access to employment

Until the 1960s, the question of gender was almost absent from economic approaches. Thus, the terms “male/female inequality”, “gender” or even “women” do not exist in epistemological issues in economics (Silvera, 2001, p. 1). Finis Welch (1967) was the first to suggest that female and male employees are complementary and no longer substitutable. He justifies this complementarity by the educational differences existing between the two groups. Within the framework of human capital theory⁵, women's responsibilities (related to household chores, child rearing, etc.) compared to men, affect their employment opportunities and discourage their investments in human capital. Furthermore, according to Becker's theory of discrimination

⁵ -According to G. Becker, human capital is an accumulated stock of knowledge and experience, capable to increasing the future productivity of an individual .

(1957), men and women a priori have the same productivity and the same human capital endowments, but employers prefer to recruit men rather than women (Havet & Sofer, 2002, P. 5). Therefore, differences in employment participation between men and women do not necessarily reflect a difference in human capital. According to Oaxaca and Blinder (1973), there are two components which explain this gap, the component linked to productivity, called: “explained part” and the component called: “unexplained part”. The latter is attributed to the existence of discrimination. Other economists such as Phelps (1972), Aigner and Cain (1977) support the argument of statistical discrimination⁶. Harriet Zellner (1972) and Mark Killingsworth (1987) rather base their approach on labor market favoritism towards men.

In addition, Polachek (1981) attributes to women the role of biological reproduction and their less attachment to the labor market. Havet (2000) confirms the choice of women to invest in family life rather in professional life. Thus, they limit themselves to professions considered “feminine”. As for the authors Mincer and Polachek (1974) and Fuchs (1989), they attribute hiring discrimination to cultural attitudes that influence people. Thus, Mr. Fawcett indicates that union rules, employer prejudices and social customs have prevented women's access to skilled jobs, sending them back to unskilled jobs.

Eggink et al (1994) thus considered the joint work offer of the wife and her partner within the household, taking into account the behavior of the woman, who is more sensitive to variations in the socio-economic environment in relation to man. This approach was further developed by Chiappori et al (1998), then by Moreau (2000), who highlighted a collective rationality of activity choices within the couple. Then comes the study of Meurs and Ponthieux in 1999, in their work dealing with the inequalities in access to full-time salaried jobs between men and women and its consequences on the measurement of salary discrimination.

According to Phillips (2000), inequalities in access to employment could be exclusively due to labor market segmentation. Fakher (2002) also confirmed that the activity rate of young women is very sensitive to the economic situation. Periods of crisis deter young women from entering the job market. But this is less and less true for older women. Aeberhardt, Pouget (2009) and Meurs, Ponthieux (2006) show that individual characteristics, such as diploma or professional experience, do not fully justify the unequal distribution of positions between men and women. Sofer & Thibout (2015), indicate that in the majority of developed countries, traditional gender stereotypes⁷ still remain relevant (Sofer & Thibout, 2015, p.273). Indeed, even though women have significantly increased their paid working time compared to men, they continue to take on almost all of the domestic work and childcare (Champagne, Pailhé & Solaz, 2015, p.209).

According to the employment survey conducted in France in 2018, the diploma explains the possibility of having a job in a more important way for women than for men (Fourrey, 2020, p. 1). Thus, the more qualified a woman is, the more likely she is to have a full-time job. However,

⁶ -Statistical discrimination consists of rejecting an individual because of a fault attributed to him or because members of his group to which he belongs are often assumed to have these faults (Parodi, 2010, p. 63).

⁷ -Gender stereotypes are opinions and beliefs about the differences between women and men, in terms of aspirations, behaviors, and skills (Lefkofridi et al., 2019). Women, more highly educated people, young people, and skilled socio-professional categories generally adhere less to gender stereotypes (Coron, 2023, p. 36, p. 43).

in North Africa, the probability of having a job is negatively correlated with the level of education for both men and women (Gherbi, 2023, p. 167).

2.2.2 Theories explaining employment integration according to gender

Many theories can explain the reasons for professional integration of men and women; such as theories related to human capital, discrimination, segmentation, and household survival strategies.

2.2.2.1 The theory of human capital

Within the framework of Becker's standard human capital theory (1971), investment in human capital (direct expenditure on education) allows for increased productivity and facilitates access to better professions. According to this theory, productive capacity is determined by a set of knowledge (education) and skills (professional training) acquired by an individual. However, the observed differences in salary between men and women come from a productivity gap (level of education and professional experience), and from discrimination (a lesser enhancement of women's human capital compared to that of men). Thus, the existence of salary discrimination leads to strong differences in the structure of male and female jobs (Meng & Meurs, 2001, p. 117).

2.2.2.2 Theories of discrimination

According to Cain (1986), discrimination models can be classified into two broad categories: the taste discrimination model and the statistical discrimination model (Havet & Sofer, 2002, p. 7). In an environment of perfect information, G. Becker (1957), with his general model of discrimination by taste, explains the discriminatory preferences of certain economic agents (employers, workers, consumers) against women. First, the model of discrimination by employers shows that for equal marginal productivity, there is a wage gap equal to the marginal⁸ psychological cost of hiring a woman. Then, the model of discrimination by co-workers (workers) assumes that some male employees are prejudiced against their female colleagues and refuse to work with them. However, this type of discrimination seems to us to play a minor role with regard to gender discrimination (Havet & Sofer, 2002, pp. 21-23).

There are two main trends: the first, introduced by Kenneth Arrow (1963), examines how beliefs about productivity can influence the hiring decisions and remuneration of different groups (female and male). The second trend, initiated by Phelps (1972), studies the consequences of the imperfect evaluation of worker productivity. The basic idea is that employers have limited information on individual productivity. In this case, they are encouraged to use the individual's gender as an easily observable characteristic, when hiring candidates and determining employee salaries. As a result, the statistical information accumulated by employers predicts certain characteristics that are attributed to the group of individuals (female and/or male).

⁸ - Becker constructs a discrimination coefficient assimilated to a non-monetary cost. This cost is considered as if it were monetary and is similar to a form of "psychological cost". The employer seeks to maximize its utility function which is the sum of profits minus the psychological cost induced by the employment of women (Becker, 1957, p. 11).

2.2.2.3 The theory of labor market segmentation

The theory of segmentation constructed in the United States can be transposed into the gender approach to the labor market. This theory is applied to the male/female division, and assumes that the primary market is more specifically male where jobs are stable and protected and better paid. Whereas, the secondary market is reserved mainly for women where jobs are unstable, devalued and unprotected. Segmentation in general thus corresponds to the need of the productive system for a non-homogeneous and non-substitutable workforce between categories of employees. Furthermore, Polachek (1981) indicates that women will tend to specialize in occupations where their career discontinuities are not penalized, that are to say in low-skilled occupations.

2.2.2.4 The theory of household survival strategies

This theory indicates that the labor supply decision of each individual is not taken in isolation, but as dependent on the strategy of the family group. Indeed, the distribution of household roles which corresponds to the Beckerian optimum⁹ is likely to vary depending on the constraints and shocks that the household faces. (Gakou & Kuepie, 2008, p. 6).

The neoclassical approach to family economics according to Becker (1991) and Zerbo (2006), shows that each household maximizes its utility by allocating the available time of each member between market work and domestic activity. This approach consists of optimizing the number of people (men, women) who contribute to the profitable activities of the household. Household survival strategies lead to minimizing the risk of poverty and ensuring the subsistence of the family group.

2.2.2.5 The theory of job prospecting

Job prospecting theory assumes that each individual has the choice between remaining inactive or looking for a job; and that the optimal strategy of a job seeker involves accepting any salary offer higher than the reservation¹⁰ salary.

According to Dan Black (1995), there are two types of employers in the labor market. The former is so prejudiced against women that they only hire male employees. The latter have no discriminatory preferences and therefore hire both male and female workers (Havet, N. and Sofer, C., 2002, P: 100). Audra Bowlus and Zvi Eckstein (1998) explain a model in which it is firms rather than employees that engage in job searches.

2.2.3 The determinants of integration into the labor market according to the gender approach in Algeria.

Theoretical and econometric studies carried out in the Algerian context have shown the differentiated trajectories between men and women in terms of access to employment. First, several determinants encouraged the massive arrival of women on the labor market, such as the

⁹ - The Beckerian optimum refers to the distribution of roles of household members, which should rather be seen as a reference. Where the head of the household is the main economic support, his or her wife has the primary role of ensuring domestic activities and the education of the children when they are young and are supposed to devote themselves to their studies (Boumbia & Kuepie, 2008, p 6).

¹⁰ -The reservation wage takes into account all the parameters affecting the labor market, such as the frequency of arrival of offers and unemployment benefits. (Cahuc & Zylberberg, 1996, p.73).

increase in the level of education, the increase in the age at marriage, as well as the transformations of values leading to new rules social (Mentouri, 2004, p. 10).

Souaber (2006) analyzes the reasons which hinder greater participation of women in economic activity ; according to the results of a logistic regression applied to data from the 2004 employment survey on the two categories of active and inactive women, the level of education plays a primordial role in the integration of women into the labor market. In his article, Talahit. F., divided female employment in Algeria into two main periods. The first period dates from 1960 to 1980 which is characterized by very low female employment, this employment is essentially urban, salaried, relatively qualified and public. However, in the second period from 1985 to 2005, the female activity rate increased following the new economic situation, the demographic transition¹¹ and socio-cultural transformations (Talahit, 2007, p. 3).

In their empirical study, Chennouf and Hafsi, show that the educational level, professional experience, being employed in industry and services have respectively positive effects on being an entrepreneur for the first bivariate probit model, and being an employee in the second model bivariate probit (Chennouf & Hafsi, 2007, p. 1).

The main results obtained by Boufenik.F are as follows: firstly, gender integration is a question of public policy. Then, the marginalization of women, in terms of access, mobility, and work flexibility, slows down development in Algeria. Finally, Algeria is not in an approach through gender integration, because public policies do not adopt laws, which aim to achieve equality between men and women (Boufenik, 2010, pp. 8.465).

Hammouda. N and Souag used two ONS employment surveys (1997 and 2007), in order to analyze the determinants of the participation of men and women in economic activity on the one hand, and to assess the role of individual characteristics in the choice of occupation status, on the other hand. Econometric results show the non-random assignment of individuals to different segments of the labor market in Algeria. They found that men are more exposed to occupying agricultural or unprotected employment compared to women. Thus, having a higher level of education increases the chances of accessing sheltered employment. (Hammouda & Souag, 2012, p. 13).

Benhabib (2017), showed in his survey, conducted in the wilaya of Tizi-Ouzou, that age, human capital and gender have a strong impact on the probability of being unemployed rather than employed. Then, the logit model carried out on the sample of women from this region, indicates that age, human capital and marital status are the most determining factors in women's orientation towards inactivity (Benhabib, 2017, p. 10). Gherbi's (2023) study on informal employment and women's access to the labor market in North Africa is a very interesting analysis. Among the results obtained: men are twice as likely as women to be active in the four countries (Algeria, Morocco, Egypt, Tunisia), but Tunisia remains the most advanced country in terms of the involvement of young people in the labor market, particularly women. According to a sample of 1004 young workers and a probit model, the choice of access to entrepreneurship

¹¹ -Demographic transition: transition in stages from a traditional demographic regime, characterized by high birth and death rates, to a modern demographic regime with the opposite characteristics (low birth rate, low mortality) (Dictionary of economics and social sciences, 1998, P: 447).

is determined by the sociodemographic characteristics of young people and their family environment. Indeed, a young man who has a low level of education, and who depends on a poor family or who has a father who was previously an entrepreneur, increases the possibility of being an entrepreneur. Similarly, young women who have a very low personal or family income turn towards self-employment (Bellache, 2023, p.107).

3. State of employment in Algeria

The analysis of the inventory provides us with an overall vision of the context of the study. Thus, in Algeria, this context is essentially characterized by increased demographic¹² growth and a rural exodus towards urban areas (urbanization), which have profoundly modified the structure of the active population. In addition, the arrival of new forms of employment (temporary work, fixed-term contracts, internships, etc.) makes the boundary between employment and unemployment increasingly blurred.

3.1 Working population in Algeria

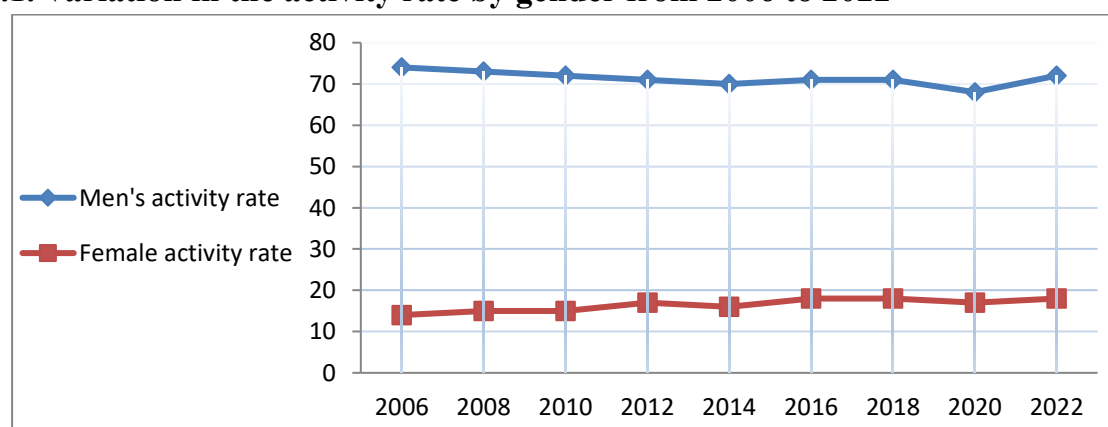
In 2023, according to the ONS, the active population was estimated at 13,425,064 people, i.e. an activity rate of 42%. The male working population represents the majority of workers with a rate of 72% compared to the female working population which is equal to 18% (ILO, 2022).

In Algeria, the active population mainly depends on the gender, age, level of education and sector of activity of the individual.

3.1.1 Evolution of the active population by gender in Algeria

The active population in Algeria has increased very slowly compared to population growth. Figure No. 1 indicates the variation in the male and female activity rate in Algeria between 2006 and 2022. For more than 20 years, the activity rate of women remains very low compared to that of men, despite the increase in level of education of women, and the efforts made by the State with the execution of a legal framework favorable to gender equality. The activity rate, or the proportion of active people out of the entire working age population, is estimated at 69.9% for men compared to only 14.8% for women in 2006. In 2022, the rate male activity rate reaches 72% compared to a rate of 18% for women.

Fig.1. Variation in the activity rate by gender from 2006 to 2022



Source: established by the authors based on estimates modeled by the ILO, 2024.

¹² -The resident population in Algeria is estimated at 46,344,000 people with a natural increase rate of 1.52%. Thus, the distribution by gender indicates a slight predominance of the male population which represents 50.6% compared to the female population (49.4%), or 103 men for every 100 women (ONS, 2023).

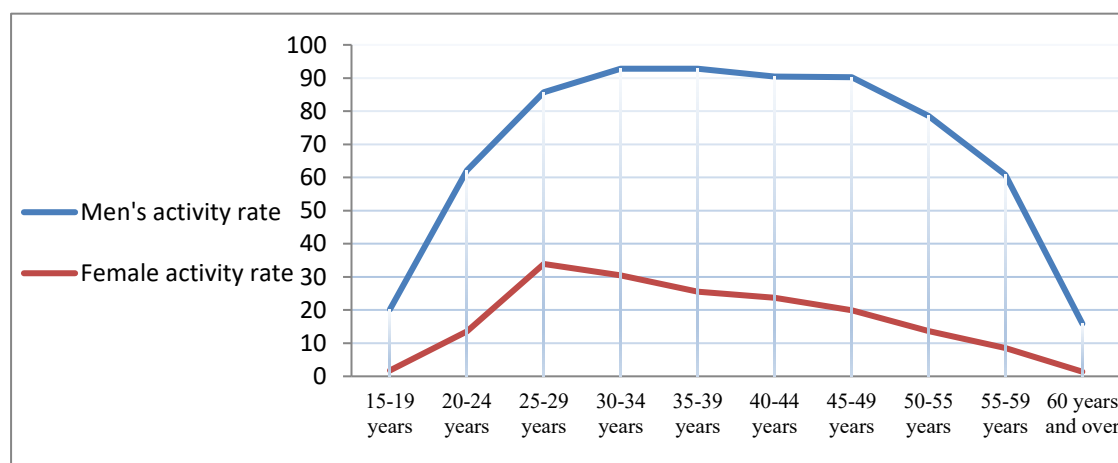
3.1.2 Structure of the active population by gender and age

The Algerian active population is characterized by its youth, particularly for the female active population. Figure No. (2) shows that the activity rate is linked to the age of the individual.

Before the age of 20, activity rates are still low due to school confrontation. It is from the age of 20 that most of the population finds itself in the labor market. The male activity rate increases with age up to the age group: 35 to 39 years, in which we observe the highest activity rate (92.8%). From the age of 40, this rate decreases slightly with age, but from the age of 60 and over (15.9%) there is a very significant drop in the activity rate. This can be explained by the family responsibilities assigned to the man as head of the household.

For women this rate also increases with age, but it reaches its maximum at an earlier age, between 25 and 29 years (33.9%). From the age of 30, the female activity rate gradually decreases with age, this is probably due to marriage and household chores, which force some women to stop working.

Fig.2. Male and female economic activity rates according to age group

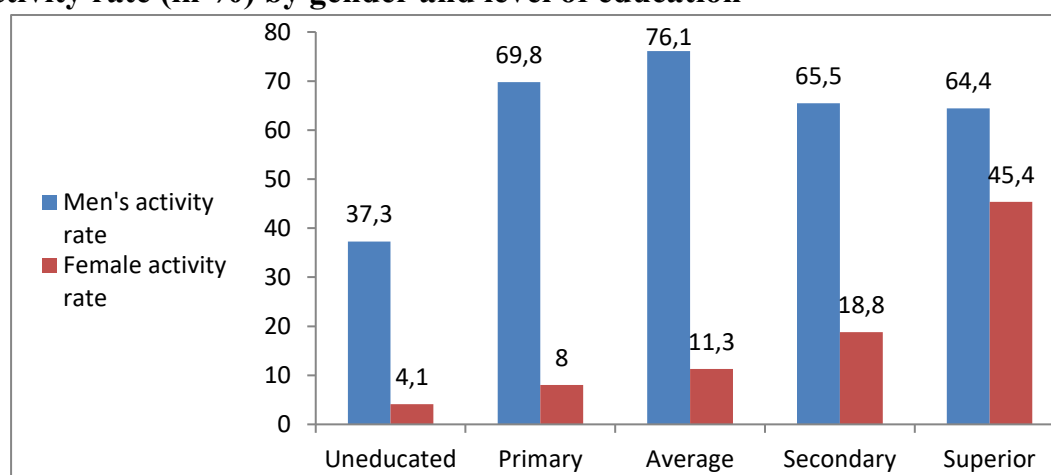


Source: Established by the authors using data from the ONS, 2019, p. 5.

3.1.3 Active population by gender and level of education

The quality of the workforce is measured by its level of education. Figure No. 3 shows the distribution of the activity rate according to gender and level of education in Algeria. It allows us to see that the activity rate of women increases with the evolution of the level of education.

Fig.3. Activity rate (in %) by gender and level of education



Source: Established by the authors using data from the ONS, 2019, p.5.

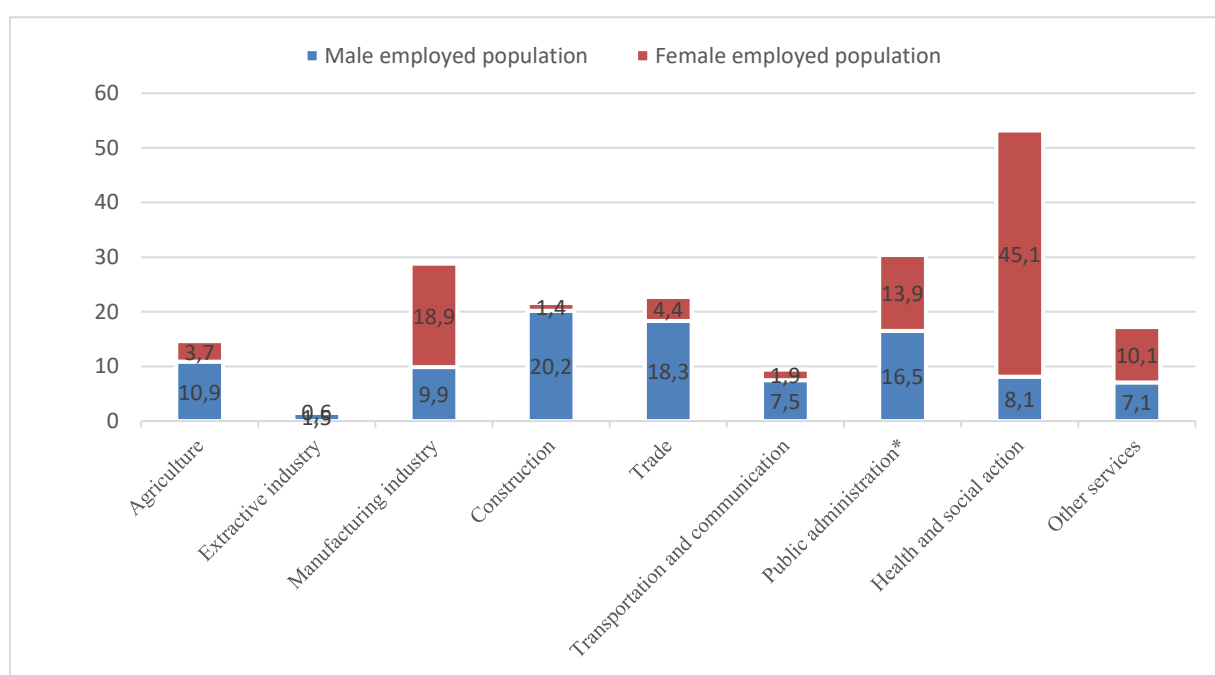
Indeed, the activity rate increases from 4.1% for women without education to 45.4% for women with a higher level of education. For men the situation is different, the activity rate increases to reach its maximum (76.1%) at the average level of education, then it decreases slightly with the evolution of the level of education; to have a rate of 64.4% relating to the higher level of education. This can be explained by the access of the majority of men to employment at an early age, without continuing their studies; following the responsibilities assigned to men within the household.

3.1.4 Active population by gender and sector of activity

The active population by sector of activity indicates the existence of segmentation by gender. That is to say the existence of purely masculine sectors and especially feminine sectors.

Figure No. 4 indicates the distribution of the employed population by gender and by sector of activity. The share of male employment reaches 20.2% in construction work, following construction assistance programs carried out by the public authorities. However, female employment only represents 1.4%. This explains why construction is characterized as purely male work. For men, commerce and public administration employ 18.3% and 16.5% respectively. Next comes the agricultural sector which employs 10%, after which comes the following sectors: manufacturing industry, health and social action, and the extractive industry, which only employed 9.9%, 8.1% and 1.5% respectively. For women, the share of employment in the health and social action sector reaches 45.1%. The manufacturing industry sector is the second largest employer of women with a rate of 18.9%, followed by the public administration sector with a percentage of 13.9%. The share of the commerce, agriculture, transport and communication, and extractive industry sectors only employ 4.4%, 3.7%, 1.9% and 0.9% respectively.

Fig.4. Distribution of the female and male employed population by sector of activity (in %) in 2019



Source: Established by the authors using data from the ONS, 2019, p. 4.

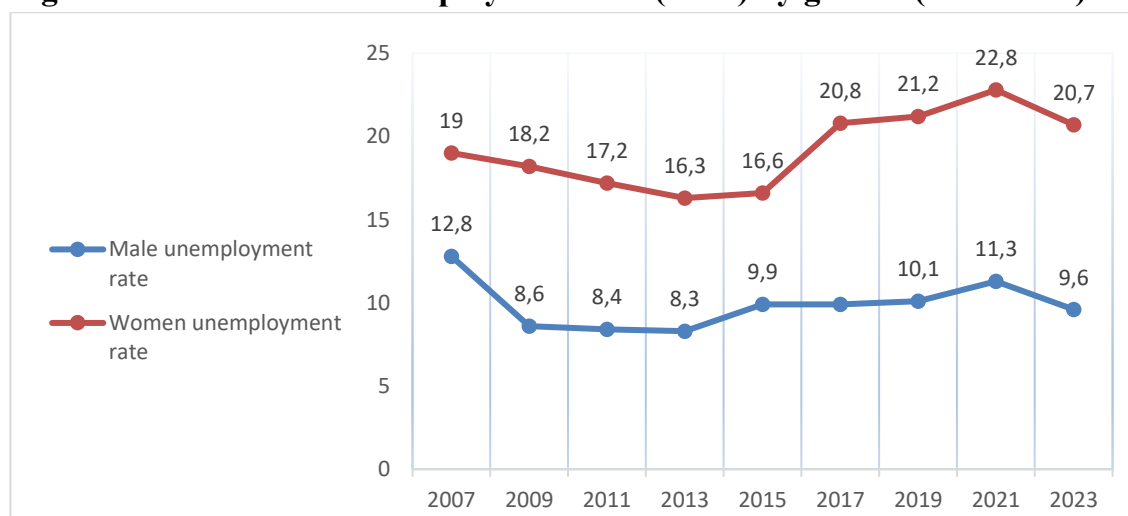
3.2 Unemployed population in Algeria

Since independence, Algeria has adopted strategies to stimulate employment; thanks to development policies in which the issue of combating unemployment is at the center. The unemployment rate in 2023 has been estimated at 11.8% (estimation modeled by the ILO), where unemployment is still higher in urban areas than in rural areas.

3.2.1 Evolution of unemployment by gender in Algeria

During the last decade, unemployment among women has been higher; with the rate being double that of men. During the period 2007 to 2013 the unemployment rate for men and women saw a significant drop, going from 12.8% to 8.3% for men, and varying from 18.3% to 16.3% for women. This reduction is induced by the establishment of employment support systems (ANSEJ, CNAC, ANGEM) without discrimination for women and men, by the public authorities. From 2015 to 2019, the unemployment rate for men saw a slight decline (from 9.9% to 9.1%), while that for women increased from 16.6% to 20.4%. Then, from 2019 to 2021 the male and female unemployment rate increased to reach 11.3% and 22.8% respectively. This increase is due to the spread of the pandemic nationally, which caused the shutdown of some businesses. As a result, several employers were made redundant. Afterwards, in 2023 and at the end of the health crisis, the male and female unemployment rate fell to reach a rate of 9.6% and 20.7% respectively.

Fig.5. Evolution of the unemployment rate (in %) by gender (2007-2023)



Source: Established by the authors based on estimates modeled by the ILO, 2024.

3.2.2 Structure of unemployment by gender and age group

According to ONS, despite the role played by ANEM and job creation assistance schemes (ANSEJ, CNAC, ANGEM) in absorbing the unemployment rate in Algeria; youth unemployment is increasing compared to adult unemployment. In fact, the main job seekers were young people. The unemployment rate particularly affects young people, with the existence of a strong disparity by gender. For the category under 20 years old, the unemployment rate stands at 29.4% (28.1% men, 44.8% women). Then, for the 20-24 years old category, it reaches 26.2% (22.2% men, 45.1% women), Afterwards, it drops to 20.8% (15.4% men, 36% women) for the 25-29 years old category. While the unemployment rate among individuals aged 30 and over decreases more and more, until reaching the rate of 2.6% (2.1% men, 5.9% women) for the age group 55-59 years old.

Table 1. Unemployment rate by gender and age group in 2019 (in %)

Age	Male	Female	Total
Under 20 Yeats old	28.1	44.8	29.4
20-24	22.2	45.1	26.2
25-29	15.4	36.1	20.8
30-34	8.4	18.7	10.9
35-39	5.6	12.7	7.2
40-44	4.1	10.4	5.5
45-49	3.8	5.7	4.1
50-54	3.1	7.0	3.7
55-59	2.1	5.9	2.6
Total	9.1	20.4	11.4

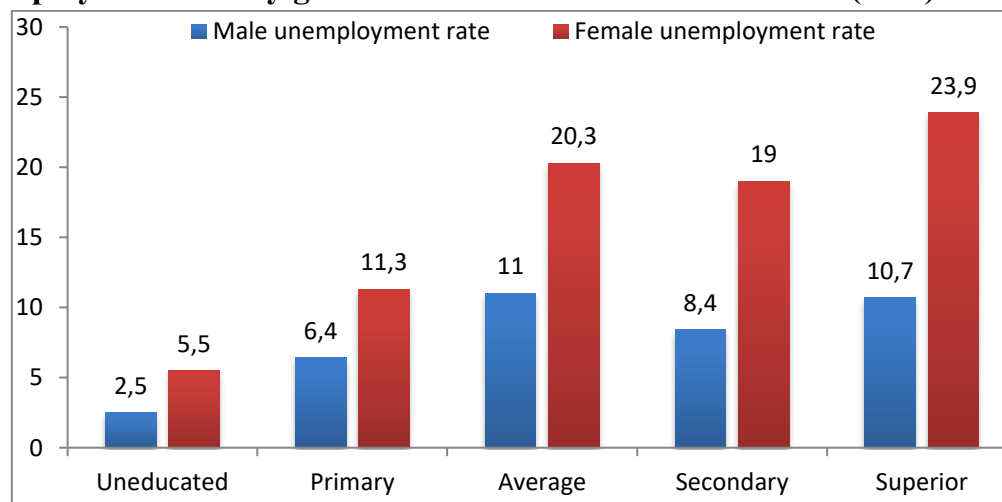
Source: established by the authors using ONS data, 2019, p. 7.

3.2.3 Unemployment by gender and level of education

According to the ONS, female unemployment more affected academics, particularly higher education graduates. This phenomenon can be explained by the high level of education of women compared to men. Although, the job market requires competent employees with a high level of education, the unemployment rate for men does not necessarily depend on the level of education. Indeed, the male unemployment rate falls for those who have no level of education, and those who have a level of primary education to reach the rate of 2.5% and 6.4% respectively. Then, men with middle, secondary and higher education level have almost similar unemployment rates, which stood at 11%, 8.4% and 10.7% respectively.

However, the female unemployment rate increases with increasing education level. Indeed, the unemployment rate for women without education and with a primary level stood at 5.5% and 11.3% respectively. This increases for the middle (20.3%) and secondary (19%) levels, reaching a rate of 23.9% for the higher level.

Fig.6. Unemployment rate by gender and level of education in 2019 (in%)



Source: Established by the authors using data from the ONS, 2019, p. 7.

4. Results obtained

The estimates using the multinomial logistic model make it possible to compare the ratio of the chances of having access to a job as an employee or self-employed or of remaining unemployed for men and women.

4.1 Data presentation and sample analysis methodology

For the econometric part, we used the database taken from the household survey carried out in 2021 in the Bejaia region, with a representative sample which includes 537 individuals, spread over 5 municipalities (2 urban and 3 rural). The employment and gender survey is carried out mainly in the large urban centers of the region. First, we will present the survey data and then we will outline the estimation methodology of the multinomial logistic model.

4.1.1. Data presentation

The study concerns individuals aged 18 and over declaring that they are active (employed, not employed), thus the dependent variable indicates the participation of individuals (men, women) in the labor market as employed (employed or self-employed) or not (unemployed). We retained the following explanatory variables: Sociodemographic variables (gender, age and marital status), area of residence, human capital approximated in our study by the level of education. The terms of the professional situation variable are distributed as follows: 120 unemployed (27 men, 94 women), 325 employees (159 men, 166 women) and 91 self-employed (63 men, 28 women).

4.1.2 Sample analysis methodology

To identify the determinants of labor market participation by gender, we used the Logit model (follows a logistic law). This model makes it possible to calculate the probability of an individual (man, woman) finding employment, as an employee or self-employed or remaining unemployed. We choose to define the unemployed category as a reference value, the coefficients of which are normalized to 0. The estimated model contains three types of variables: continuous variables (age), binary variables (gender, place of residence) and qualitative variables with more than two modalities (marital status, level of education). We assume that the three modalities of the endogenous variable (professional integration) are independent. And the error terms follow a logistic law. The multinomial logistic model is formulated as follows:

$$y_g = \frac{i}{x_g} = \frac{e^{(x_g \beta_i)}}{\sum_{i=1}^i e^{(x_g \beta_i)}} + \varepsilon_g \dots\dots\dots (1)$$

Where i represent choices;

g Indicates the gender of the individual (man, woman);

β_i Parameter vector linked to the characteristics x_g ;

y_g Represents the factors that determine the probability of participating or not in employment for an individual g; ε_g refer to error terms.

From equation (1), we obtain the probability of participation in employment P (between 0 and 1), formulated as follows:

$$\text{For men: } p_h = P\left(y_h = \frac{i}{x_h}\right) = \frac{e^{(x_h \beta_i)}}{1 + \sum_{i=3}^{i-1} e^{(x_h \beta_i)}}$$

$$\text{For women : } p_F = P\left(y_F = \frac{i}{x_F}\right) = \frac{e^{(x_F \beta_i)}}{1 + \sum_{i=1}^{i-1} e^{(x_F \beta_i)}}$$

4.2 Identification of factors in the integration of individuals into the labor market

Factors of access to employment for the active population as employed (employee, self-employed) or not employed; are estimated by a multinomial logistic model using a labor supply equation for the overall population (Table No. 2). According to the likelihood test and the chi-square test we see that the estimate is overall significant, that is to say there is at least one of the independent variables exerting an influence on the dependent variable. The pseudo- R^2 indicates a performance of 30%, because these are qualitative variables. We retained the following three determinants: Socio-demographic determinants, area of residence and human capital.

4.2.1 Socio-demographic determinants of workers' access to employment.

Sociodemographic variables (gender, age and marital status) have an effect on the probability of being employed or self-employed, taking the unemployment situation as a reference. Being a man increases the odds of entering the labor market as an employee and as a self-employed person rather than remaining unemployed. Men are 4.4 more likely to have a job as an employee compared to women; also, men are 9.1 more likely to be self-employed compared to women. This explains the relevance of the gender approach in determining access to employment. Thus, a man has a better chance of accessing employment as a self-employed person than working as an employee. Age increases the probability of participating in the labor market, relative to the unemployed, up to a certain level where the possibility of having a job decreases with increasing age. We also note that older individuals are more likely to be employed than to be self-employed. Since protected jobs require professional experience, which will be acquired automatically with age. All things being equal, single people and married people with children are less likely to be self-employed compared to the unemployed. Since individuals prefer salaried employment which is more stable and less risky.

4.2.2 Area of residence and participation in the labor market

The area of residence (urban or rural) has no influence on the probability of active workers accessing the job market, or remaining unemployed. Indeed, currently the rural environment no longer represents an obstacle to entering the labor market, following the improvement of the mode of life in rural areas, and the development of means of transport.

4.2.3 The effect of human capital as a factor in access to employment

In our study, the level of human capital is approximated by the education level variable. Firstly, the fact of being without education or with a primary level reduces the probability of having access to employment (salaried, self-employed) relative to the unemployment situation (Individuals with at most a primary level of education has respectively 3.1 and 1.6 times less likely to work as an employee and self-employed compared to the unemployed). Subsequently, having a low level of education (no education + primary level and middle level) reduces the ratio of chances of participating in the labor market as an employee.

Table2. Estimation by the multinomial Logistics model of the factors of access to the labor market

Exogenous variables	Employee		Independent	
	B	Exp(B)	B	Exp(B)
Mal gender	1.488*	4.426	2.205*	9.068
Age	0.644*	1.905	0.505*	1.657
Bachelor	-1.003	0.367	-2.260**	0.104
Married without children	-0.340	0.712	-0.903	0.406
Married with children	-0.898	0.407	-1.741***	0.175
Rural area	0.358	0.699	-0.274	0.760
Without education and primary level	-3.124*	0.044	-1.572*	0.208
Average level	-1.275**	0.279	0.012	1.012
Secondary level	-0.363	0.696	0.004	1.004
Constant	0.646		-0.306	
-2 log of likelihood	471.666			
Khi-carré (sig)	153.900			
Pseudo-R2(Negelkerke)	30%			
N	537			

Source: calculations established by the authors using SPSS software version 27, 2023.

The reference category is the unemployed.

*Significant at 1%, **Significant at 5%, ***Significant at 10%

4.3 Specification of the determinants of participation of men and women in employment

In order to specify the determinants of access to employment separately for men and women, we introduced two secondary equations of labor supply which firstly indicate men's access to the activity and in secondly, women's access to work (table No. 3). The estimation of the two multinomial logistic models is overall significant. The pseudo-R2 indicates a performance of 30% for the male group and a performance of 33% for the female group. Older men are more likely to be employed as self-employed than as employees, taking the unemployed category as a reference. Thus, age increases the ratio of chances of access to paid employment for a man by 2.468 times and for a woman by 1.977 times. Since some married women decide to stop working to take care of domestic work. As a result, age constitutes a barrier to female work. But men enter the job market at an early age, even before completing their studies, until retirement.

Table3. Estimation by the multinomial Logistics model of the determinants of the integration of men and women into the labor market

Exogenous variables	Men				Women			
	Employee		Independent		Employee		Independent	
	B	Exp (B)	B	Exp (B)	B	Exp (B)	B	Exp (B)
Age	0.903**	2.468	0.782**	2.186	0.681**	1.977	0.453	1.572
Divorced, Other	-0.521	0.594	0.077	1.081	-0.409	0.665	-2.157*	0.116
Married	0.246	1.279	1.098	2.998	0.322	1.380	-0.843	0.430
Without children								
Married with children	1.771**	5.879	2.139**	8.494	-1.027	0.358	-2.261**	0.104
Rural area	-0.038	0.962	0.278	1.320	-0.563*	0.569	-0.873*	0.418

Analysis of the determinants of labor market integration in Algeria: Gender approach

Without education and primary level	-1.142	0.319	0.197	1.218	-4.513	0.011	-1.845**	0.158
Average	-0.798	0.450	0.001	2.721	-0.813	0.443	-1.203	0.300
Secondary	0.751	2.120	1.548**	4.702	-0.616*	0.540	-0.915	0.401
Constant	-0.643		-2.53		0.6		0.700	
-2 log of likelihood	209.441				208.439			
Khi-carré(sig)	172.024				179.368			
Pseudo-R2 (Nagelkerke)	30%				33%			
N	249				288			

Source: calculations established by the authors using SPSS software version 27, 2023.

The reference category is the unemployed,

*Significant at 1%, **Significant at 5%, ***Significant at 10%.

Regarding marital status, a married man with children is more likely to have a job as an employee or self-employed compared to a single man. However, the probability of participating in the labor market as self-employed for a married woman with children decreases compared to a single woman. This situation reflects the reality of the household. Being married with children requires the head of the household to seek employment, whether independent or salaried, to provide for the needs of their family. The multiplication of responsibilities linked to various household tasks and child-rearing for a married woman with children discourages women from entering the job market.

Residing in a rural area reduces the ratio of chances of accessing the labor market for a woman, as an employed person compared to an urban area. However, the area of residence has no influence on the probability of access to employment for a man. This can be explained on the one hand by the socio-cultural traditions with regard to female work linked to the resident of rural areas, and on the other hand by the work of women in other informal sectors such as agriculture. For a man, having a secondary level of education increases the probability of participating in self-employed employment by 4.702 times, compared to a higher level. For a woman, the fact of being without education or with a primary level reduces the possibility of having a job (salaried, self-employed) relatively to the higher level. Thus, the fact of having a secondary level for a woman reduces the possibility of being an employee compared to the higher level. These results show that access to self-employed employment for a man does not require a higher level of education. Since some informal activities do not require a high level of education. Concerning women with a high level of education, they prefer to remain unemployed while waiting for a better job position, instead of having a job downgraded in relation to their level of study.

5. CONCLUSION

The analysis of multinomial logistic regression offers an econometric study which consolidates the theoretical study, linked to the determinants of professional integration of men and women in Algeria. We retained the following three determinants: Socio-demographic determinants (gender, age, and marital status), area of residence and human capital approximated by the level of education. The estimation of the multinomial logistic model is carried out first, using a labor supply equation for the overall population. Then, we introduced two secondary equations of

labor supply which indicate firstly the access of men to the activity and secondly the access of women to work.

The estimation of the global equation of labor supply confirms the relevance of the gender approach in determining individuals' access to employment in Algeria (confirmation of hypothesis 1). Indeed, being a man increases the odds of entering the labor market as an employee and as a self-employed person rather than remaining unemployed. Thus, men are respectively 4.4 and 9.1 more likely to have a job as an employee and self-employed compared to employed and self-employed women.

The probability of participation in the labor market is an increasing function of age, up to a certain level where the possibility of having a job decreases with increasing age. However, age constitutes a barrier to female work, since some married women decide to stop working to take care of domestic work. But men enter the job market at an early age, even before completing their studies, until retirement, particularly for the self-employed.

Marital status constitutes a determining factor in the participation of individuals in employment, particularly for married people with children compared to single people. This situation encourages men and discourages women from entering the job market. Indeed, a head of household is forced to work to provide for himself and his family. However, the woman withdraws from the labor market to take care of household chores and educate her children. For women, the low level of education reduces the possibility of access to employment as an employee or self-employed, relative to the unemployed modality; which confirms G. Becker's hypothesis on the importance of human capital in women's access to employment (confirmation of hypothesis 2). However, access to self-employed employment for a man does not require a higher level of education. Indeed, certain informal activities do not require a high level of education. Concerning women with a high level of education, they prefer to remain unemployed while waiting for a better job position, instead of having a job downgraded in relation to their level of study, this explains the rate high unemployment among women compared to men.

The fact of residing in a rural area reduces the probability of access to employment for a woman, compared to the urban area, this is due on the one hand to the work of women in other informal sectors such as agriculture, and on the other hand to the socio-cultural habits which are spreading in the rural areas of the wilaya of Bejaia. Furthermore, the lessons learned from the standard theory of human capital allow us to confirm on the one hand that human capital in Algeria positively affects women's employment for a certain level of education, but it negatively affects men's access to employment as self-employed. On the other hand, by referring to the modern theory of job prospecting, we validate the hypothesis that individual characteristics (gender, age, marital status, level of education, place of residence) play an important role in the participation of workers in the labor market. However, they do not affect the integration of men and women into employment in the same way (confirmation of hypotheses 2 and 3).

The high unemployment rate, particularly for female graduates, and the importance of informal activity carried out by both men and women explain the inability of the formal labor market to absorb those leaving the higher education system.

Discrimination linked to the individual's gender, and the weight of socio-cultural traditions can also be very explanatory variables of the individual's professional situation but which are

difficult to measure. In order to refine and generalize our results at the national level, it is essential to expand the study sample in the wilaya of Bejaia, and in other wilayas of Algeria. It is also interesting to carry out a comparative study on the determinants of access to employment by gender, between two wilayas of Algeria; for example, a northern wilaya and a southern wilaya. Finally, the results obtained imply the need to pursue gender equality policies in terms of employment integration by public authorities in Algeria.

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