

Empirical analysis of the women's employment in the Maghreb countries

تحليل تجريبي لعمل المرأة في دول المغرب

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Abstract :

ملخص :

Despite the economic growth opportunities of the female workforce, women in the three Maghreb countries (Algeria, Morocco and Tunisia) faced low levels of activity for more than three decades. The aim of this work is to determine the reasons that hinder the development of women's employment in these three countries. The study made use of linear regression method with the least square method on panel data for the period 1991 to 2017. The results obtained confirm a certain spatial variability. It appears from the study that women's unemployment rate and the male unemployment rate explains a little more female participation rate in Algeria but less in Morocco and Tunisia. And these social and cultural factors are the main obstacle to women's access to employment in these countries.

Keywords : Activity rate; female employment; informal employment; OLS; GDP / h.

رغم فرص النمو الاقتصادي التي تمثلها القوى العاملة النسائية، تواجه النساء في البلدان المغاربية الثلاثة (الجزائر والمغرب وتونس) معدلات منخفضة للنشاط لأكثر من ثلاثة عقود. يتمثل طموح هذا العمل في تحديد الأسباب التي تؤدي إلى إبطاء تطور عمل المرأة في البلدان الثلاثة. تستخدم الدراسة طريقة الانحدار الخطي باستخدام أقل طريقة مربعة على بيانات اللوحة للفترة من 1991 إلى 2017. تؤكد النتائج التي تم الحصول عليها بعض التباين المكاني. يتبين من الدراسة أن معدل بطالة النساء ومعدل بطالة الرجال يفسر أكثر قليلاً معدل نشاط النساء في الجزائر ولكن أقل قليلاً في المغرب وتونس. وأن العوامل الاجتماعية - الثقافية هي العقبة الرئيسية أمام وصول المرأة إلى العمل في هذه البلدان

الكلمات المفتاحية: معدل النشاط ، توظيف الإناث، عمل غير رسمي ، الناتج المحلي الإجمالي، للفرد

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1. INTRODUCTION:

Female employment is a work force reserve underutilized source for wealth creation, economic growth and social cohesion. The rate of female participation in the labor force in North Africa remains among the lowest in the world, estimated at 22.5% in 2015 (ILO, 2016). It rised in 2017 to 19.22% in Algeria, to 26.05% in Morocco and to 26.46% in Tunisia (World Bank, 2018). The opportunities for women to access the labor market and to be able to evolve in line with their abilities are now part of challenges that have set many societies. Thus, it should explore all ways to explain the low female participation rate.

In this work, we opted for a linear regression by the least square method on panel data to explain the low female participation rate in the three countries. We took as explanatory variables: female unemployment rate, the unemployment rate of men and GDP per capita. We have chosen to study variables that have not been explored by various empirical studies that address the determinants of women's employment in Algeria, Morocco and Tunisia.

This work is structured in three sections. The first section presents analysis of the theoretical and empirical literature of female employment. This approach will highlight the reasons that hinder the development of female employment. In the second section, we analyze the economic integration of women in the three Maghreb countries. A third section presents an empirical study by mobilizing panel series covering the period from 1991 to 2017.

2. LITERATURE REVIEW:

The employment of women is a driving force in the overall development approach, but there are many barriers to women's participation in the labor market in the three countries, both in the economic situations and in the weakness of public policies. To this added other barriers such as family support, education level and the weight of tradition.

Studies that have addressed the nature of the relationship that exists between the employment rate of women and the education level showed and a high level of training provides access to jobs in the most lucrative sectors (Mincer, 1974). This relationship was confirmed by another study conducted by the OECD in 2011, where it shows the existence of a positive correlation between employment and training, employment rates rise with the level of education among men and women on average. The female employment rate stood at 48.9% of those whose education level is lower than the second cycle of secondary education and 80% among graduates of tertiary education.

El Mataoui R (2017) also confirms that in Morocco, more educated women are the more difficulties of insertion in the labor market are smaller. Souaber H. (2006) for its part has analyzed the causes that hinder greater participation of Algerian women in economic activities, and arrived at results that education plays a important role in the integration of women in the labor market. This was confirmed by Mujahid and Zafar (2013) showing that female education remains a major indicator of female participation in the labor force. In all these studies adds Analysis Himrane M. et al. (2016) which shows that the probability that a woman in the Maghreb participating in the labor force increases with the evolution of its education. Gouider A. (2009), tried

to identify the determinants of women's activities in Tunisia. He also measured the wage discrimination by gender. He conducted a study on the basis of statistical data from the author's 1999 employment survey; the author came to the conclusion that, in the same economic characteristics, women are victims of wage discrimination.

When the relationship between female employment and fertility, Laplante B., (2008) notes that in international comparisons, the participation rate of women does not seem linked systematically to fertility. It is noted that the fertility rate is highest in the Scandinavian countries with the average of two children per woman, and lowest in Germany and Austria and in the countries of southern Europe, with an average fertility rate hardly more than a child. A priori, fertility is not an obstacle to women's participation in the labor market.

However in a study conducted in Turkey, where female participation rate in declined (from 72% in 1955 to 24.4% in 2007). Onur Çakir (2008) reveals a negative relationship between the female participation rate and fertility rate; that is to say, when the number of children per woman decreased, women find themselves lightened the load of children and become more available gainfully employed to improve the well-being of their households. The same results were confirmed by an empirical study by Aboohamidia A. (2013). The author has studied the factors behind the female participation rate in the labor market for a country panel (Pakistan, Egypt, Morocco and Turkey). His findings confirm that fertility rates negatively influences the rate of female participation in the labor market.

In contrast, women's entrepreneurship enables job creation, economic growth and innovation. The diversity of entrepreneurship has a positive impact on socioeconomic development (Verheul et al, 2006). In 2012, Morocco, only 20% of working women are employed, 14.7% are independent, 57.3% were homemakers and 12% work in cooperatives (Moisseron JY, 2017). Thus, in a context of economic recession and unemployment growth, the development of entrepreneurship in general and women's entrepreneurship in particular can serve as a fundamental lever for job creation. But a survey by the World Bank between the period 2003 - 2010 shows that the female entrepreneurship in the MENA region represents only 15% of companies in this region (Cawtar, 2015). The development of women entrepreneurship is hampered by the influence of cultural values and stereotypes (Touzani, et al, 2015).

Furthermore, a qualitative study by Salman et al. (2011) conducted in Morocco shows that women entrepreneurs in Morocco encounter difficulties related to social practices that are justified by the traditions and customs. These social practices imposed on women to observe certain rules of conduct with respect to their families and society. But also, women entrepreneurs in Morocco are motivated by the search for independence, autonomy and personal fulfillment Himrane M. (2018).

For women entrepreneurs, it should be distinguished between the directors of the company that develop their activities in more or less autonomous, in the formal sector, and women at the head of a micro enterprise (self-employment) mostly informal. In reality, women's work is much more developed, but it is sometimes invisible and unrecognized in the calculation of GDP. Generally it merges with informality¹.

The weak female employment in the formal sector is offset by faster growth in the informal sector. Statistics show that the proportion of women in informal employment

¹ Informality is apprehended by affiliation or not employed under a social security system.

is growing faster than their participation in formal employment (34.1% in 2005 against 42% in 2010 (Souag A., 2018).

However, if the trend is rising this can be justified by the fact that some women may receive coverage through the registration of their spouse or parent. Globally, about 40% of women who have an employment do not contribute to social protection (ILO, 2016).

If women are much more in the informal employment in the formal employment is because they have socioeconomic characteristics favorable. Indeed, traditions, social norms and the care of children makes women prefer undeclared work from home. A phenomenon confirmed by Lakjaa A. (1997) through his study of informal work in Algeria where he was particularly interested in women workers in homes. This study confirms that among the main reasons for the prevalence of home work in women is primarily looking for a subsistence income and secondly the family opposition expected to work outside and in third place the benefits that this type of activity provides as childcare.

Gherbi H., conducted a study in 2014 to determine the characteristics of women's informal employment in Algeria. This study is conducted at the wilaya of Bejaia (Algeria), on a sample of 319 women engaged in the formal sector and 157 working in the informal sector. The results of the study show that women who have a high probability of fitting on the informal labor market are those with low education and those with a vocational diploma. These results are in line with those of Gherbi H. and A. Adair (2016) in their study conducted on a sample of 726 working women drawn from a household survey. The authors confirm the first results of their study and exploring other determinants of Informal employment female namely living conditions of the household. Indeed, women are more oriented towards the informal sector when the householder already has an informal activity.

The same results were also confirmed by the study of Souag A., F. Adair and Hammouda NE (2016) on the trends and characteristics of informal employment in Algeria (2001- 2010). Through multivariate analysis, the authors used a distribution function of the logistic and the results of these estimates show that women have a higher probability of being informal employment compared to men, especially single women compared to married women.

Also Lassassi and Hammouda (2014) analyzed the rate of informal employment in cohorts with comparative analysis between men and women. The findings of the study show that the low level of education increases the probability of integrating the informal sector.

When the relationship between women's work and economic development, several authors have established a relationship U-shaped women's participation rates are high in poor countries and rich countries but lower in urban middle-income economies. Among these authors are cited Goldin C. (1995), which examined the impact of GDP per capita on the part of the active population of women aged 45 to 59 years. In the same vein analysis, Mammen and Paxson (2000) provide an analysis of 90 countries

which shows that women's participation rate in the labor market has a U shape in relation to per capita income. Thus, the positive relationship between economic development and women's participation appears in rich countries. This is confirmed by an empirical estimate by Dzossa AD et al. (2015), at 26 SSA countries. It appears from this study a negative relationship between the logarithm of GDP / capita and the employment rate of women.

Unemployment is another factor determining the participation of women in the labor market. The male unemployment rate has a negative impact on women's participation in the labor market (A. Tansel, 2001) but that of women has more impact than men (Onur Çakir, 2008). When unemployment rates are relatively high, it will be more difficult for women to enter the labor market and the probability of not being employed increases. This makes the woman a discouraged worker. According Tansel A. (2001), is the assumption of a discouraged worker which explains a negative effect between the rate of female employment and unemployment. The assumption of the additional worker says that when men lose their jobs, women can enter the labor market in order to increase the family income. So, This hypothesis suggests a positive impact on women's participation in the labor market (Tansel, 2001). But according Kottis AP, (1990) the effect of "additional worker" is dominated by the worker effect discouraged because of the unavailability of jobs for women, especially in developing countries.

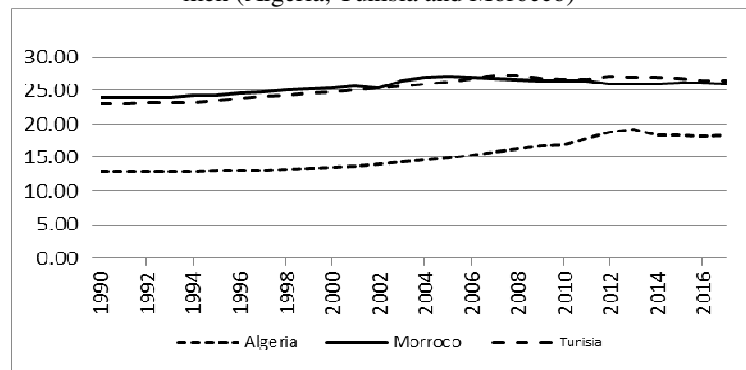
Besides all the obstacles to women's activity mentioned above, there is the low job application from enterprises, which in some cases prefer men than women (Pissarides et al., 2005).

3. THE ECONOMIC INTEGRATION OF WOMEN IN THE THREE MAGHREB COUNTRIES:

One of the indicators commonly used to estimate the participation of women in the labor market is the employment rate. It measures the proportion of the female population with a job or looking for employment in relation to the female population of working age.

The comparative analyses of statistical data of the three countries are tough and ready for a lot of reservations. Nevertheless, these data can be used to identify major trends in female employment. Women's participation rate in rural areas is very different from that of women in urban areas. It's in the urban where training efforts are most interesting to improve women's participation rate. In Morocco, for example, the influence of the level of qualification is mixed. It is negative in rural areas, it is still positive in urban areas (Moisseron JY et al, 2017).

Fig.1. Evolution of women's participation rate in the labor force compared to men (Algeria, Tunisia and Morocco)



Source: World Bank, online data accessed on 07.01.2018.

According to paragraph 1, the time evolution of the employment rate is slightly marked on the period. However, this trend is similar in the three countries. As well as spatial variability is observed. Indeed, among the three countries, it is observed that Algeria is marked by the weakness of the female participation rate. The situation is slightly less marked in Tunisia and Morocco. Demographic change is put next to the job itself conditioned by the nature of the business model of each country. This is explained by the fact that countries that enjoy an important oil sector such as Algeria, have female participation rates below the non-oil countries like Tunisia and Morocco (Mr Ross, 2008). Such result is argued by Moghadam (2013) that the oil sector is highest revenue generator earned by men. These revenues have limited job search offers women during the years of the oil boom.

To this end, an element worthy of note. This is the link between female employment rate and standard of living measured by GDP / capita. Indeed, over the period, GDP per capita expressed in PPS is higher in Algeria than in Morocco and Tunisia.

The dynamics of women's participation in the labor market increases when economic conditions are unfavorable and decreases when it is favorable (and Bhalotra Umana-Aponte, 2010). This negative relationship is explained by the fact that households who suffer a loss of income are forced to mobilize the entire workforce of the household, including those of women.

Another point to note is that the proportion of women is slightly less weak in Algeria, which represents, over the whole period, a less than 50% as shown in Table 1.

Table 1: Proportion of women relative to total population% (1960-2017)

Years	1960	1970	1980	1990	2000	2010	2017
Algeria	49,68	49,73	49,61	49,38	49,32	49,52	49,50
Morocco	50,17	50,55	50,26	50,11	50,45	50,72	50,47
Tunisia	50,14	49,85	49,74	49,72	49,83	50,41	50,60

Source: World Bank, online data accessed on 07.01.2018

This may explain the low female participation rate in Algeria compared to Moroccan and Tunisian is the standard of living of women in Algeria, as measured by GDP / h and wife of proportion to men. Indeed, oil revenues allow men to have higher incomes and consequently limit the need for women to seek employment during the years of the oil boom (Ross, 2008; Moghadam, 2013).

4. METHODS AND MATERIALS:

For this work, we focus our study on the influential factors of the participation rate of women in the three Maghreb countries (Algeria, Morocco, and Tunisia); we have chosen as exogenous variables, the standard of living through the GDP variable / h, female unemployment rate and the male unemployment rate. The choice of these variables is dictated by the relatively similar socio-economic context in the three countries.

To carry out our work, we opted for a linear regression with the least square method on panel data. The data we used in our study, time series are extracted from the database World Bank population (Modeled ILO estimate). The sample is a panel whose total number of observations is 81; $N = 3$ countries (Algeria, Morocco, Tunisia), and $T = 27$ years covering the period from 1991 to 2017.

The variables used in this study are defined as follows:

We chose as the endogenous variable the female participation rate (TAF). The TAF is the share of women participating in the labor market compared to the female population aged 15 and over (modeled estimate ILO).

As exogenous variables, we took the female unemployment rate (TCF), the male unemployment rate (TCH) and GDP per capita.

TCF represents the female unemployment rate in% of the female workforce. The choice of this variable is justified by the fact that a woman is unemployed discouraged to continue looking constrained by the support of family and children.

GDP / h is gross domestic product converted to international dollars using current rate parity purchasing power (PPP). According to the results of empirical studies (C. Goldin, 1995; Mammen and Paxson, 2000; Dzossa AD et al. 2015), we assume a negative relationship between female employment rate and GDP / h.

TCH: Is the male unemployment rate. The choice of this variable is justified by the fact that it is the male unemployment that lead women to remain inactive to leave existing employment positions for men.

The choice of variables is guided by the ambition to explore the variables used in the literature review but not studied for the case of Algeria, Morocco and Tunisia.

As the data we used in our study are panel data, the appropriate linear regression model to the data, is written in its theoretical form, as a two-index model that takes the following form:

$$Y_{it} = \alpha_i + \sum \beta_{ik} X_{kit} + \varepsilon_{it} \quad \text{with } i: 1 \dots N \quad t: 1 \dots T$$

The estimation of this model is done using the three methods namely common effect model or model of lesser bulk square (PLS) model with fixed and random effects model effects. The choice of the most appropriate model is based on several tests: test Chow test Hausmann.

To explain the female participation rate in the labor market in countries (Algeria, Tunisia, Morocco), we opt for a linear regression on panel data, the mathematical formulation is written as follows:

$$Y_{it} = \alpha_{0i} + \beta_{1i} X_{1it} + \beta_{2i} X_{2it} + \beta_{3i} X_{3it} + \varepsilon_{it} \dots \dots \dots (1)$$

With

Y_{it} = (TAF) observed endogenous variable for country i at time t ;

$X_{1it}, X_{2it}, X_{3it}$ = (TCF GDP / H, TCH) observed explanatory variables for country i at time t ;

α_{0i} = Constant term for country i ,

$\beta_{1i}, \beta_{2i}, \beta_{3i}$ = coefficients of the three exogenous variables for country i ,

ε_{it} = Error term for country i at time t .

5. RESULTS AND DISCUSSION:

In this section, we will spread results of estimates of the model shown in Equation (1). We made estimates on a model of panel which is composed of three regressions: common effect model (none or pooled), the fixed effects model and random effects model (Random).³

We based on Hausman test and Fischer to choose between the three panel regressions. According to the results obtained by the test Hausman which shows that the probability attached to the Hausman test statistic is greater than 5% ($pr = 1$), which implies that the random effects model is most appropriate for our study. In this regard, the result will be felt is shown by the following equations:

$$TAF_A = -1,600 + 36,646 + 0,259 * TCF_A - 0003 * PIB_A - 0.633 * TCH_A$$

$$TAF_M = -3,170 + 36,646 + 0,259 * TCF_M - 0.0033 * PIB_M - 0.633 * TCH_M$$

$$TAF_T = 4,771 + 36,646 + 0,259 * TCF_T - 0003 * PIB_T - 0.633 * TCH_T$$

The estimation results show that the coefficients associated with the variable female unemployment rate (TCF) and variable male unemployment rates are statistically significant (their respective p-value <5%, $pr = 0.0275$ $Pr = 0.0014$). Therefore, they have an effect on female employment rates.

² Greene W., (2011)

³In the random effects model, residues may be interconnected between times and between individuals or cross-sections. This model assumes that there is a difference in the intercept for each individual and the interception is a random variable.

In addition, there is a non significant effect on the growth of GDP per head since (p-value > 5% pr = 0.2358). We also note a negative effect between the variable (GDP / h) and the female participation rate in the labor market. This result is consistent with the theoretical basis.

Fischer statistic confirms the overall significance of the exogenous variables (TCF, TCH, GDP/ h) on the participation rate of women in the labor market, since the p-value < 5%. (Pr = 0.031).

A positive correlation found between female employment rate and the female unemployment rate. It is explained by unemployment among women, especially in early career where it is not an obstacle to the participation of women in the labor market. So women in the three countries are not discouraged by unemployment but rather they are motivated to work to improve the well-being of their households. The negative correlation between the unemployment rate of men and the female employment rate is explained by the fact that due to the unavailability of formal jobs and the loss of income suffered by households, women are forced to take jobs in the informal sector.

Moreover, the insignificant effect for the variable per capita GDP is also not consistent with the literature review. The female employment rate is not explained by the level of economic development as advocated by different studies. This leaves assuming female participation rates, in the three countries is explained by other factors (social and cultural) that are not included in the model because it is a model effects random.

However, the random effects model estimates panel data where protest variables can be linked temporally and spatially. In this type of model, the constant term is divided into a fixed term and a specific term random to each country to control individual heterogeneity.

It turns out after consultation of the three equations of the model, that the female participation rate is influenced by many factors that are not all introduced as explanatory variables. however we find that the female unemployment rate and the male unemployment rate explains a little more female participation rate in Algeria than women in Tunisia and Morocco. The randomness is explained by the weight of tradition and the individual characteristics of women in Tunisia and Morocco such as seeking independence, autonomy and personal fulfillment.

CONCLUSION :

In this work, we used a linear regression by the least square method on panel data to explain the low female participation rate in Algeria, Morocco and Tunisia. The results of this study indicate that unemployment is not a hindrance but male unemployment force women to take up employment in the informal sector to meet household needs. However, estimating the random effects model shows that the reasons which hinder women to join the labor market, is also explained by sociological factors and specific cultural in these countries. Specifically, the weight of tradition, which is one of the reasons for low female participation rates (Talahite 2008; Jutting et al, 2010). In the

end, it is socio-cultural factors and traditional role assigned to women as mothers and wives which is the main barrier for the access of women to work.

To support and maintain the access of women in the labor market, it is desirable that job creation should be supported by public policies favorable to quality work for women, which take account of gender realities, regional specificities and socio-economic parameters and culture of each country.

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Appendices

Table 1. Dependent Variable: TAF

Method: Pooled EGLS (Cross-section random effects)

Sample: 1991 2017

Included observations: 27

Cross-sections included: 3

Total pool (balanced) observations: 81

Wallace and Hussain estimator of component variances

Cross-section ON (CSGP) standard errors & covariance (df corrected)

Variable	Coefficient	Std. error	Does Statistic	Prob.
VS	36.64630	9.623436	3.808026	0.0003
TCF?	0.259445	0.115430	2.247640	0.0275
GDP?	-0.003375	0.002824	-1.194980	0.2358
TCH?	-0.633855	0.191842	-3.304053	0.0014
Random Effects (Cross)				
A - C	-1.600420			
M - C	-3.170995			
T - C	4.771414			

Source:made from operating data on Eviews 9

Table 2. Correlated Random Effects - Hausman test

test Summary	Chi-Sq. Statistic	Chi-Sq. df	Prob.
Cross-section random	0.000000	3	1.0000

Source:made from operating data on Eviews 9

Table 3. Cross-section random effects comparisons test:

Variable	Fixed	Random	Var (Diff.)	Prob.
TCF?	0.389909	0.259445	0.001258	0.0002
GDP?	-0.005339	-0.003375	0.000001	0.0419
TCH?	-0.803559	-0.633855	0.009346	0.0792

Source: made from o