THE DYNAMICS OF FEM ALE LABOR FORCE PARTICIPATION IN SELECTED MENA COUNTRIES (Algeria, Egypt, Jordan, Palestine and Tunisia)

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Abstract

This paper considers the female labor force participation (FLFP) behavior over the past decade in five MENA countries namely, Algeria, Egypt, Jordan, Palestine and Tunisia. Low FLFP rates in these countries, as it is in other MENA countries, are well documented. We conduct synthetic panel analysis using age-period-cohort (APC) methodology (Deaton-Paxson normalization and Maximum entropy estimation) and decompose FLFP rates into age, period and cohort effects. We present our results with two approaches to the APC methodology in order to observe robustness of our results. The analysis is carried out by educational attainment, marital status and rural/urban regional differentiation. Further we note the differentials in age, period and cohort effects across the countries we study. Implications of our results for possible government policies to increase FLFP rates are discussed.

Key words: Female labor force participation, synthetic panel analysis, MENA countries.

JEL Classification: C23, C25, D1, J21

1. Introduction

Female labor force participation (FLFP) is at the center of policy discussions around the world in particular in the MENA region. The very low levels of FLFP in the MENA region have been well established. Recent data illustrates that the MENA region continues to rank the lowest in the world in terms of women's participation in the labor force (Global Gender Gap Index 2012). Thirteen of the bottom 20 countries out of the 145 countries covered by the report are MENA countries.

A rich literature examines the determinants of FLFP in MENA countries. The most common factor discussed in the literature is the conservative gender norms "Islamic culture" and "social norms" in the region (Clark, Ramsey and Adler 1991, Ingelhart and Norris 2003, Haghighat-Sordellini E, 2009). Some authors analyze the role of demographic characteristics and family composition on FLFP. Marriage is thus a transition, which, for women, adds substantial domestic responsibilities that can make it difficult for women to engage in market work (Assaad & El-Hamidi, 2009; Assaad, Krafft & Selwaness 2017, Tansel, 1994, 2002, Al-Qudsi, 1998, Assaad et al. 2018).

A major gap in the empirical literature on FLFP in MENA has been in research on the dynamics of FLFP. There are no studies of FLFP by cohort analysis in the MENA countries except a recent one in Turkey. Most of the empirical literature on the dynamics of FLFP focused on the case of developed and Latin America countries (Crespo, 2007; Deborah 2001; Yang , 2010; Baudelot, and Gollac, 1995; Bourdallé and Cases, 1996). Tunalı, Dayıoğlu and Kırdar (2017), study the aggregate labor force participation behavior of women over a 25-year period in Turkey using a synthetic birth cohort analysis. They find robust age-profiles for a typical woman over her life cycle. The M-shape attributable to child-bearing related concerns is detected in rural areas and for low-educated women in urban areas.

In this paper we study the aggregate labor force participation behavior of women using a synthetic birth cohort analysis that provides new evidence of the dynamics of FLFP across the life course and over time in five MENA countries (Algeria, Tunisia, Jordan, Egypt and Palestine). These pseudo-panels provide a unique dataset of 'archetypical' individuals that can be followed over time and used to assess how changes in the cohort-level employment conditions affect their behaviors of labor force participation by exploiting both the temporal and cross-sectional variability. The unique feature of the cohort analysis is that we follow a cohort of individuals over time. This enables us to decompose the participation rates into life

cycle, generational and business cycle variations. This is often referred to as APC (Age-Period-Cohort) methodology. First, examination of the life cycle patterns show the movements of women of various age groups such as the young and elderly. Second, examination of generational patterns may help identify the long-run trends in participation abstracting from the age and business cycle effects. This enables answering questions about the structural changes in the economy. Third, the study of business cycle effects may help to consider the sectors of the economy with pro-cyclical or counter-cyclical employment patterns and possible added worker effect. These aspects have not been considered before for the MENA countries.

In the context of the female labor force participation, age effects may include life-cycle decisions such as the timing of education, children and retirement. Period effects may include business cycle effects or policy changes that effect the female labor force participation. Finally, cohort effects may include the improved educational attainment and lower fertility rates of younger cohorts and changed social norms.

The outline of the final paper is as follows. After the introduction, Section 2 presents a brief review of the literature on FLFP in MENA and identifies gaps in the literature. Section 3 discusses the methodology followed and the data used in the paper. Sections 4 present the labor market situation in the selected countries. Section 5 presents the results of the analysis, and Section 6 concludes.

2. Brief Review of Literature

FLFP has been studied extensively in the developed and developing countries including several MENA countries. Most of these studies have focused on the determinants of participation using cross-sectional data. The current study uses comparable cross-sectional surveys to perform cohort analysis over a decade in five MENA countries namely Algeria, Egypt, Jordan, Palestine and Tunisia.

Recently in many countries it is observed that rising education levels increase FLFP rates as it is shown by Tansel (1994) in Turkey. There have been significant gains in education in all of the five countries considered in this study. However, in some countries the FLFP remained stagnant. For a detailed study of this observation in the case of Egypt consider Assaad et al. (2018).

Several studies confirm that FLFP rate varies by the stage of economic development of a country. Boserup (1970) proposed the notion of U-shaped pattern for FLFP rates over the development process. Goldin (1995) and Mammen and Paxson (2000) and others verified this shape for FLFP rates. Psacharopoulos and Tzannatos (1989) and Cagatay Ozler (1995) provided evidence on this in international context. In this study we also perform analysis for the countries we consider in order to find out their position on the U-shaped pattern. The falling portion of the U-shaped pattern is explained by illiterate women holding manual jobs which may not be socially acceptable. At low levels of industrial development most women work in agriculture where they can combine household chores with income generating activities. As a result FLFP rates are high. During the industrialization process women have less work opportunities in urban areas where they cannot combine labor market and household work. Their participation declines. In the following period service sector jobs increase. Increases in education levels of women together with reduced fertility rates allows them to hold white-collar jobs which are socially acceptable. Therefore, in the rising portion of the U-shape, FLFP rates increase. Mammen and Paxson (2000) find in India and Thailand that FLFP is lower in urban areas than in rural areas and tertiary educated have significantly higher FLFP rates as it is the case in many countries like Turkey (Tansel, 1994).

Recent research has also investigated the effect of macroeconomic crisis on FLFP. One aspect of this is known as the added worker effect. This defines an increase in FLFP in the face of economic downturn. Evidence on this remains scanty in the MENA region. A recent study on Canada is by Tansel and Ozdemir (2018). Licona (2000) in Mexico and Dasgupta and Goldar (2005) in India find that when real wages decline or men become unemployed due to economic crisis, FLFP increase from low income families. Lack of income and unemployment insurance system cause women to increase their participation in order to sustain their level of income and consumption.

APC methodology have a variety of applications in different areas. Applications to female labor supply relations in developed countries include Blundel, Duncan and Meghir (1998), Pencavel (1998) and Devereux (2007). There are several studies in developing countries also. Duval-Hernandez and Romano (2009) conducted an APC analysis of labor participation in Mexico. They decomposed FLFP rate into age, period and cohort effects. Life-cycle patterns of FLFP rate exhibit the usual inverted U-shape.d The FLFP is found to be countercyclical suggesting possible added worker effect. Long-run generational effects exhibit a rising

participation rate. Warunsiri and McNown (2010) investigate labor supply behavior of women in Thailand using APC methodology handling the individual heterogeneity, wage endogeneity, sample selection and data aggregation. They disaggregate by age, cohort, educational attainment, marital status, and by place of residence. Tunali, Kirdar and Dayioglu (2017) provide APC analysis of FLFP in Turkey. They consider the differences in behavior by different education levels and rural/urban region. They find M-shaped life-cycle profile for urban women and also for low-educated women. They employ three approaches while conducting the APC decomposition. These are Deaton-Paxson approach, intrinsic estimator and maximum entropy approaches.

3. The Data and the Methodology

We decompose the changes in female labor supply into age, time and cohort effects by using synthetic cohort analysis, namely, the APC methodology. Therefore we will be able to examine the effects of demographic and socio economic factors on FLFP. We compiled and harmonized micro data from official labor force surveys in the five countries spanning the period from 2000 to 2014. The longest series of surveys is available for Egypt and Palestine where we have a continuous series of Labor Force Surveys from 2000 to 2014 (Central Agency for Public Mobilization and Statistics, Palestinian Central Bureau of Statistics). For Jordan we have data from the Employment and Unemployment Survey for 2000-2003 and 2005-2014 (Department of Statistics). For Algeria, we have data from 2001 to 2007 and 2010 (National Office of Statistics). Finally for Tunisia, we have data from 2005 to 2008 and 2010 to 2013 (National Institute of Statistics). We use the annual rounds of HLFS to obtain a pooled cross-section dataset for individuals aged 15-64. Our pooled dataset doses not follow the same group of people over time. As described in detail below, we construct synthetic cohorts by categorizing individuals using their age-period identifiers and fellow them. Since each cross-section is representative of the population, we can learn about changes in behavior by examining the participation rates of successive cohort at the same phase in their life cycles.

The main analysis consists of estimating a series of cohort-based models to analyze determinants of FLFP in five MENA countries. This analysis consists to follow the same cohort over time. The model captures age and cohort effects as indicators of (unobserved) determinants of participation behavior. We use these effects and observed determinants to construct trends of labor supply. Birth cohorts born in different time periods that encounter different historical and social conditions as they age would conceivably have diverse

developmental paths. Separate analyses by place of residence (urban vs rural) and level of education are conducted.

The major challenge of estimating separate age, period, and cohort effects is the "identification problem" induced by the exact linear dependency among age, period, and cohort (cohort = period – age). Different solutions to the model identification problem have ignited continuous debates on whether any solutions exist or which solutions are better. In executing the APC decomposition methodology we work with two approaches: The first one is due to Hanoch and Honig (1985) and Deaton and Paxon (1994) and the second one is called Maximum Entropy (ME) approach due to Browning, Crawford and Knoef (2012). Deaton and Paxon approach is the most popular one in economics. It imposes arbitrary restriction to achieve identification. Since each approach makes different assumptions to get around the perfect collinearity between age, period, and cohort indicators, use of both of these approaches allow us to evaluate the robustness of our estimation results. Differences in FLFP behavior are examined by different education levels, marital status and by rural/urban region.

Individuals are averaged within each cohort. This could handle the problem of heterogeneity bias. Antman and Mc Kenzie (2007) suggest that this could also solve the problem of individual measurement error.

Deaton-Paxson normalization

The Deaton-Paxson normalization approach was first introduced in Hanoch and Honig (1985), and was further described in Deaton and Paxson (1994). The basic idea of the Deaton-Paxson normalization is to impose one extra parametric restriction so the APC model becomes just identified. First the variables are detrended, and then the restriction that time effect dummies are orthogonal to a trend and sum to zero is imposed. The coefficients for age, period, and cohort can then be estimated using OLS.

Maximum entropy estimation

The maximum entropy method was first used to solve the APC model by Browning et al. (2012). This is an information-based approach where the maximum entropy is used as a principle to address the problem. The approach is based on the belief that there is not enough information in the data to provide one unique solution. Instead of finding one unique solution, the maximum entropy principle provides a framework that can formalize the uncertainty in the model and estimate the most likely solution (Browning et al. (2012)). According to Conrad

(2013), “The maximum entropy principle tells us to seek the probability density function such that certain constraints and use the density satisfying the constraints with the largest entropy”.

4. Labor markets situation in the selected countries

The economies of the countries studied differ in terms of their natural resources and structure. However they tend to share the fact that the recent economic growth is not sufficient to sustainably generate enough jobs. Recent social movements ‘Arab Spring’ have shown the fragility of the situation on the labor market in all four countries.

Table 1: Labor market indicators

	Algeria			Egypt			Jordan			Palestine			Tunisia		
	Male	**Female**	**Total**	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**
Population **(10^3)**	20133	19738	39872	47409	46369	93778	4641	4518	9159	2413	2336	4749	5570	5703	11274
0 - 14 years (%)	29	28.3	28.7	33.8	32.5	33.1	36.1	36	36	39.5	39.1	39.3	24.5	22.9	23.7
15 - 29 years (%)	26.2	25.9	26.1	26.6	26.3	26.4	27.4	27.6	27.5	30.1	29.8	29.9	24.9	24.1	24.5
30 - 64 years (%)	39.3	39.6	39.4	35.3	35.5	35.4	33	32.4	32.7	28.0	27.7	27.9	43.6	44.8	44.2
65 and over (%)	5.6	6.2	5.9	4.4	5.8	5.1	3.5	4	3.8	2.5	3.3	2.9	6.9	8.3	7.6
Labor force participation rate	66.6	16.6	41.8	73.6	22.4	47.8	60	12.6	36.4	71.9	19.1	45.8	70.8	24.4	47
Labor force participation rate Youth 15-24 years	41.2	8.2	25.1	42.3	20.2	31.5	38.1	7.6	23.2	52.9	11.6	32.7	46.6	22.1	34.6
Unemployment rate	8.1	20	10.5	7.7	24	12	10.1	20.7	11.9	22.5	39.2	25.9	12.6	23.5	15.5
Unemployment rate - Youth 15 - 24 years	22.3	49.9	26.7	26	59	34	26.4	53.3	30.6	36.4	60.8	40.7	34	33.5	35.5
NEET*	10.8	32.1	21.2	18.9	35.2	26.8	15.2	34.8	24.6	26.4	38.1	32.1	21.2	29.9	25.4

***** Share of youth not in education, employment or training.

Source: Official labor force survey –World Bank -2016.

The population share of 15 to 24 years-old varied between 24 and 30 percent. In Tunisia the proportion is around 24%. This proportion is 30% in the case of Palestine. For the population aged between 30 and 64, the largest share is observed in the case of Tunisia (44.2%) and Algeria (39.4%). The share of those younger than 15 is also substantial particularly for Palestine (around 40%).

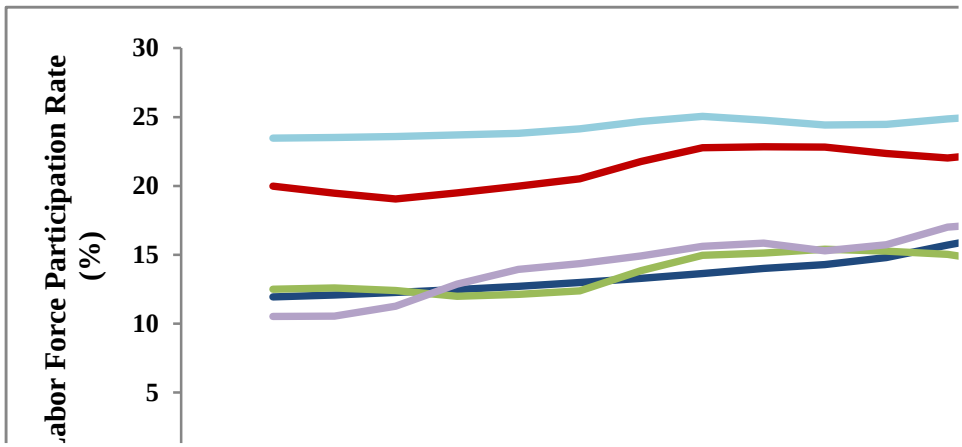
Female labor force participation is very low in MENA region. Comparing the five countries, Jordan and Algeria have the lowest female participation rate 12.6% and 16.6% respectively. On the other hand, the highest rates are observed for the case of Tunisia (24.4%) and Egypt

(22.4%). Youth find more difficulty to enter the labor market. The situation is more complex for young female. In fact, the participation rate in the labor force is relatively low for youngest female: 8.2% in Algeria, 7.6% in Jordan, 11.6% in Palestine.

The highest unemployment rate is observed in Palestine with 26% in 2016, followed by Tunisia 15.5% (2016). For Algeria, Egypt and Jordan, the unemployment rate is 11.5%. The youth, especially girls are the most affected. This rate has reached 60.8% in Palestine, 59% in Egypt and 53.3% in Jordan.

Around one in four young people (15-24 years old) are excluded from school, from labor market and from training. The most important NEET rate is observed for the case of Palestine 32.1% followed by Egypt 26.8% and Tunisia 25.4%. This proportion is more important for females. The highest rate is recorded in Palestine at 38.1%.

Figure 1: Trends of Average Female Participation Rates, by Country



Source: Computed by the authors based on data from World Bank.

The changing demographic dynamics (declining fertility coupled with increase female level of education expected to contribute to favorable condition for increasing labor force participation of females. However, the failure of the economy to integrate females into the labor market becomes quite disturbing.

Figure 1 shows female labor force participation rates in selected MENA countries. Despite a long-standing pattern linking women's economic participation with education, rapidly rising education levels among women in MENA countries has not been translated into higher levels of labor force participation for women. The figure shows that Tunisia had the highest

participation rate while Jordan had very low participation rate. In all countries the participation rates are flat except for Palestine where the female participation rate has increased relatively, albeit from very low initial rate, rising from 10% in 2000 to around 19% in 2017.

5. Results

The regression for labor force participation, by individual **i**, aged **a**, belonging to cohort **c** in period **p** can be written as:

$$Y_{iapc} = \mu + \alpha_a A_{ap} + \beta_p P_p + \gamma_c c_c + \varepsilon_{iapc}$$

Where a =1,....,n , p =1,.....,n, c =1,.....,(p−a) and c = p−a. A, B, and C denote dummies for age, period, and cohort. A_a is set to one if person **i** is aged **a** at the end of year **p**. C_c is a dummy set equal to one if person **i** was born in year c and P_p is a dummy set equal to one if labor force participation is recorded in year p. Then Y is a binary variable which is equal to one if individual **i** born in year **c** at age **a** in year **p**, zero otherwise.

We are able to observe 15 same cohorts in all five countries (those born between 1938 and 1985) in all our cross sections.

Table 2: Cohorts followed

	Algeria	**Egypt**	**Jordan**	**Palestine**	**Tunisia**
Birthday	**1936 - 1995**	**1936 - 2001**	**1936 - 2001**	**1936 - 1999**	**1941 - 1998**
Cohort	[1938- 1941]	[1954-1957]	[1950- 1953]	[1946- 1949]	[1942- 1945]
	[1958- 1961]	[1974-1977]	[1970- 1973]	[1966- 1969]	[1962- 1965]
	[1978- 1981]	[1994- 1997]	[1990- 1993]	[1986- 1989]	[1982- 1985]

Figure 2 illustrates that the female participation in the labor force have an inverted-U shape over the life cycle. It is observed that the participation rate of young cohort and old cohort remains low, whereas substantially higher participation rates for those in the peak age group have relatively flat profile between 35 to 50 age cohorts. The participation rate and its determinants vary systematically by age the of the female. The low participation of younger age groups may be due to the increasing enrolment in education.

Noting some differences between the five countries: 1) for Algeria, Egypt and Palestine the period when participation rate is stable is more prolonged compared to others countries, 2) For Algeria, Tunisia and Jordan, the curves overlap, which means that women's

participation in the labor market has not really changed. On the other hand, in the case of Egypt and Palestine, there is a gap between the curves, which means a change in the behavior of women's participation in the labor force. Noting that each curve corresponds to a specific cohort. 3) For the oldest generations, the participation rate of women is higher in the case of Egypt. Indeed, as an example for the cohorts born between 1942 and 1945, the participation rate of women for Egypt is 14% against 8.7% for Palestine, 6.1% for Tunisia, 6% for Algeria and 5.8% for Jordan. On the other hand, for the youngest cohorts, the labor force participation rate the highest in the case of Tunisia 41.7% for the cohorts born between 1978 and 1981. For Algeria the rate is 19.8 %, for Egypt the rate is 34.1%, about 30% for the case of Jordan and 20.4% for the case of Palestine for the same generations (1978-1981).

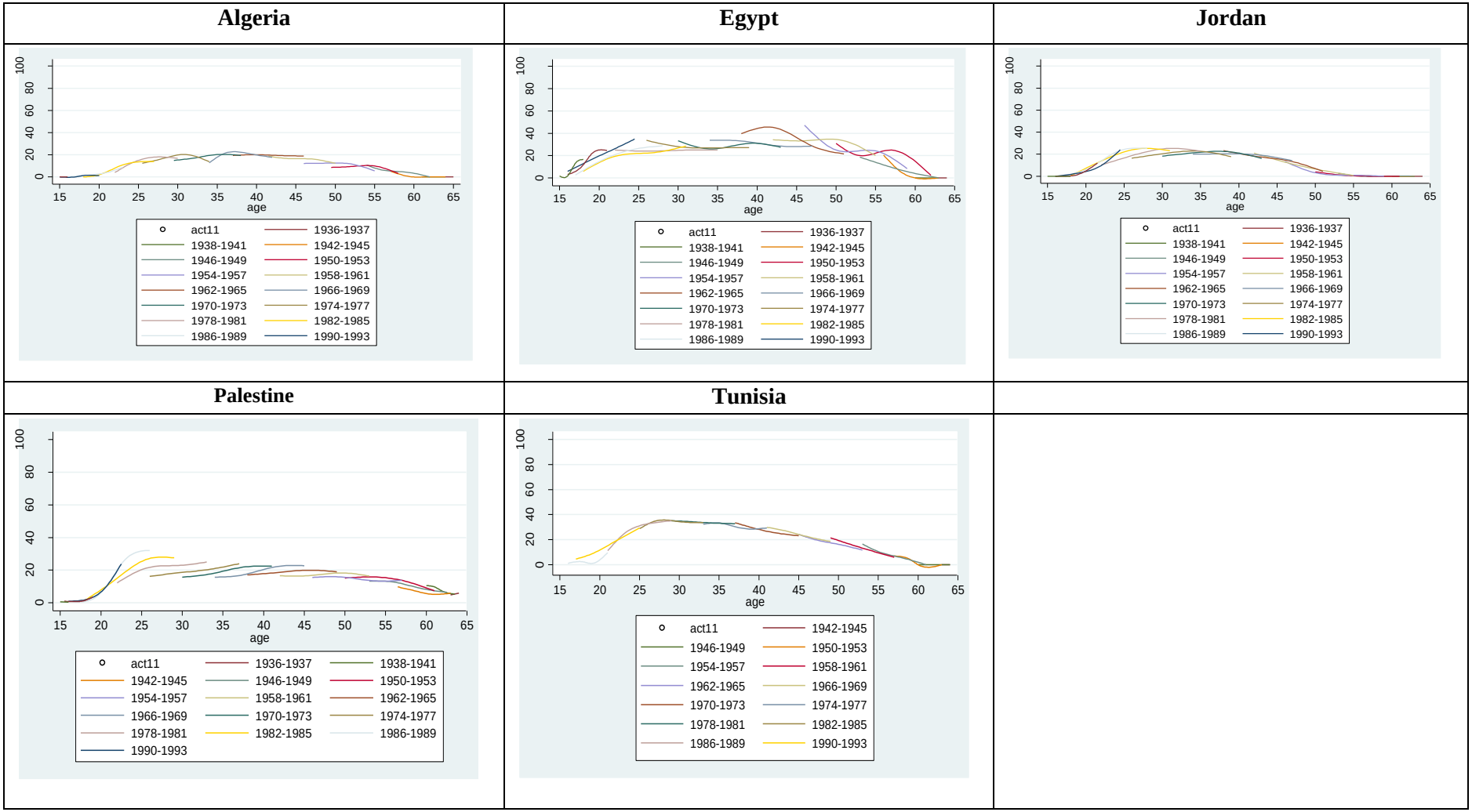
Appendix Figure 1 reproduces these graphs for women living in rural and urban areas. Two patterns are worth underscoring: First, in the case of Algeria, Jordan and Palestine, the fluctuation in female participation in the labor force is more visible in the rural area. This signifies a change in activity behavior for women residing in rural area. Secondly, in urban areas the oldest cohorts of women are much likely to participate in the labor market. In rural areas, on the contrary and perhaps surprisingly, the oldest cohorts of women are less likely to participate in the labor market.

Appendix Figure 2 reproduces these graphs for women according to marital status (Never Married vs has been Married). Marriage has been highlighted in the literature as an important factor in explaining female participation in labor force. Marital status affects FLFP in two key ways. First, after marriage, women typically take on the role of care-giver in the family, which significantly alters the allocation of their time, especially after childbirth. Second, marriage broadly changes a woman’s social position and status, a married woman joins the labor force only when social norms and the stigma attached to labor conforms to family restrictions. With the exception of cohorts at the extremities, the youngest and the oldest one, we can observe for all countries that participation rates are higher for Never Married women compared to Ever Married women. Second observation, participation rate fluctuations are more pronounced in the case of Never Married women, which mean that the change in the labor market behavior is more frequent for this category of women. Finally, for women who has been married we can notice that the curves the curves are superimposed, which means less changes in women's behavior.

Fertility behavior of women is also very important with regard to their labor force participation decision as children influence the opportunity cost of market work. The lower fertility rates of younger cohorts of women and the negative correlation between children and labor force participation imply a higher participation rate for younger women. The fertility rate observed in Algeria and Tunisia is lower compared to Egypt, Jordan and Palestine. The peak fertility rate is recorded for women aged from 25 to 29 for all five countries, but with a higher rate for the case of Palestine and Jordan (see figure 4 annex).

Appendix Figure 3 reproduces these graphs for women according to the level of education. A cohort is defined by year of birth, gender, and education level, namely: Without Instruction, Below Secondary, Secondary and University. The analysis is for the most part based on individuals aged between 25 and 64 years old in order to fully span the life cycle of labor participation. The lower age range of 25 is selected because after this point very few individuals change between the previous educations categories, guaranteeing that the cohort analysis tracks the same population groups over time. Education level has been highlighted in the literature as an important factor in explaining female participation in labor force. The empirical papers find that female participation rates increase substantially with education. We can observe that for the lowest level of education (below secondary and without instruction) that the participation rates are very low for all cohorts. We find the same results for all countries. However, for the secondary and university level, we can observe high female participation rate. Other results, the participation rate is higher for the youngest cohorts compare to oldest one. This result is due to the improvement of the educational system in MENA region. The gab in education attainment between men and women is more and more reduced.

Figure 2: Female Participation Rates by Country – Cohort



Source: Computed by the authors.

Decomposition Results

In this section, we presents the results of decomposition exercise using method disentangling age, cohort, and time effects with different specifications (urban vs rural residence, marital status and education levels). For education indicator, as mentioned before, in order to avoid misclassification errors due to young individuals changing education cohorts, the analysis is limited to workers aged between 25 and 64 years old.

Age Effects

Figure 3 displays the estimated age, year, and cohort profiles of the labor force participation rate, which are quite consistent with the two different methods except for Algeria (in the rural area – figures 10 & 11). The Figure 3 illustrates the life cycle profiles of labor force participation free of cohort and business cycle effects. The profiles have a standard inverted-U shape, with highly female entering the labor force at a later age, which is expected because at this age the proportion enrolled in education is higher. For all groups, participation is high and stable until around age 50 when workers start retiring with some differences between countries. The time for stability of the participation rate is more important in Egypt, Palestine and Algeria. However, the participation rate for the cases of Jordan and especially Tunisia decline is observed before age 50. When we decompose by urban vs rural areas, we can see that the participation rate decreases in the rural area at the advanced age compare to the situation in urban area. This result is due probably to the hard condition of work in rural area, so women go out the labor force at advanced age. In the case of Egypt (in urban area) age profiles display a slight M-shape. This M-shape suggests that some women are temporarily exiting the labor force for childbearing purposes.

Appendix Figures 12 & 13 reproduces these graphs for women according to the marital status (Never Married vs has been Married). The profiles have a standard inverted-U shape for both Never Married and women who has been married. The participation rate is higher for women (never married) for all categories of age.

Appendix Figures 14 to 17 reproduces these graphs for women according to education level. For women without education we can see that the participation rate is relatively stagnant. We find the same results when we analyze the situation of females with level of education below secondary, the participation rate is stagnant except for the case of Palestine and Tunisia where the participation rate decline for the oldest people. For secondary and university level, we can observe inverted-U shape for the cases of Palestine and Tunisia. However, for the cases of Algeria, Egypt and Jordan, we can see a decline in the participation rate.

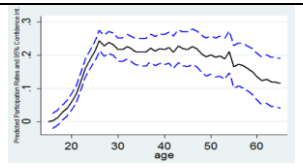
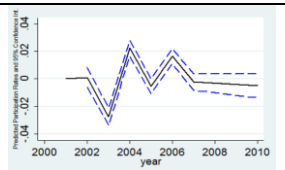
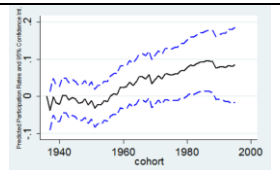
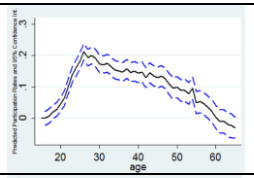
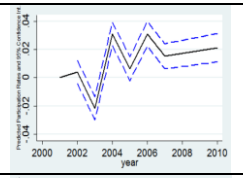
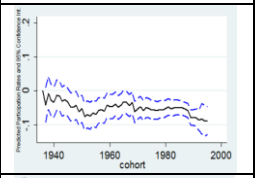
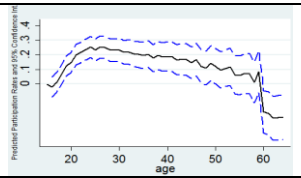
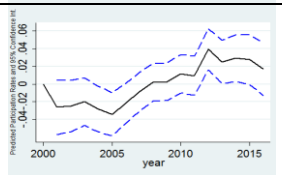
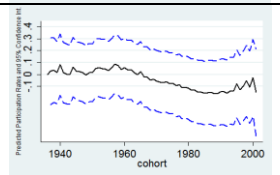
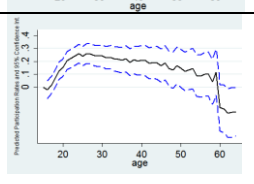
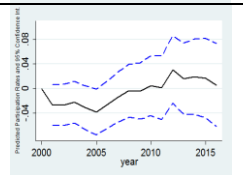
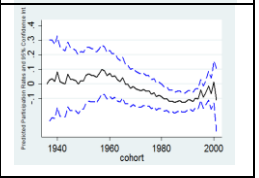
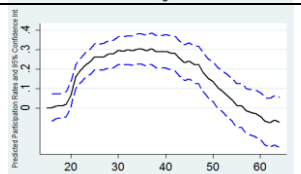
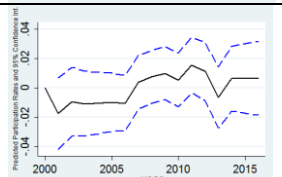
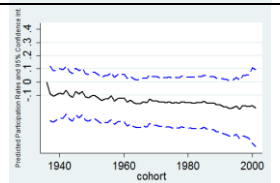
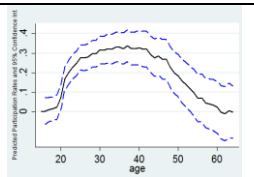
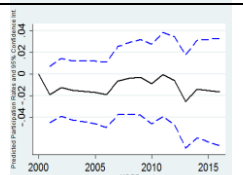
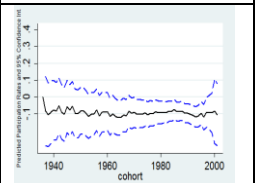
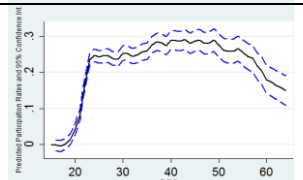
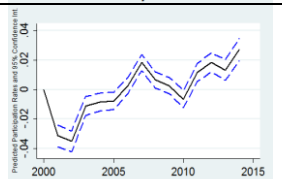
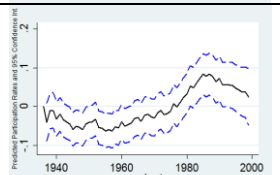
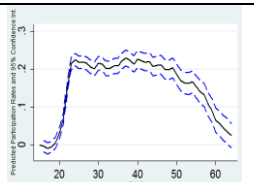
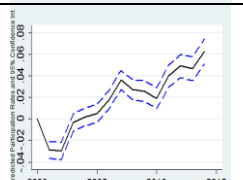
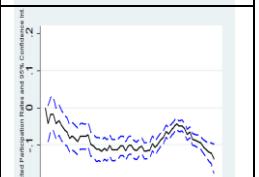
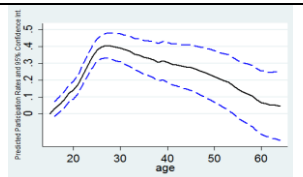
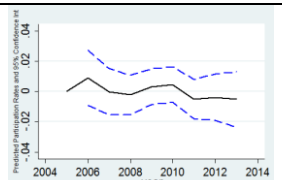
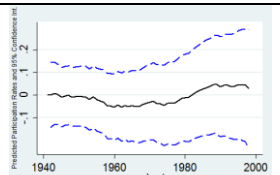
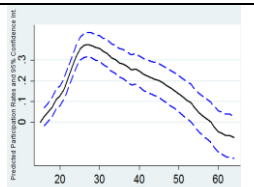
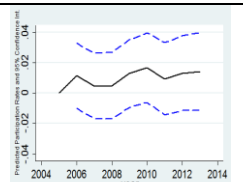
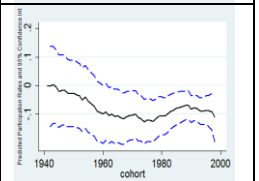
Cyclical Components

We discuss in this section the cyclical fluctuations in the participation rates. In order to emphasize the cyclical variations rather than the absolute divergence in overall levels, all of the components are presented as deviations from their means. In the case of Algeria, whatever the specification area of residence, marital status or level of education, we can observe important fluctuation in females participation rate, probably this is due to the fact that labor force survey in Algeria (biannual survey) does not capture well women's work especially in the rural area. For the cases of Egypt and Palestine, we can observe an increase in females participation rate over time. For both Jordan and Tunisia, the participation rate is stagnant over the period of observation (2000 – 2014). The results show an increase in the females participation rate in the urban area with less fluctuations compared to the rural area where the fluctuations are more important. Figure 13 & 14 shows an increase of females participation rate for both never married and women who has been married in all countries except for the case of Tunisia where the participation rate is stagnant. Appendix Figure 4 reproduces these graphs for women according to education level. For university level we can observe an increase in females participation rate but only for the case of Jordan. For the other countries the participation rate is stagnant.

Cohort Effects

The graph indicates that the labor force participation has remained stable over generations in the cases of Jordan, Tunisia, and Egypt with the exception of a small decline in the case of Palestine among the new generations. In the urban area we can see that the participation rates are stable over generation except for Tunisia where the participation rate increase, however in the rural area the participation rate decline significantly. For marital status, the results show for the case of Egypt a decrease of participation rate for Never Married Women. On the other hand, the participation rate increases for women who have been married . The participation rate is low for the youngest generation for Never married and higher for youngest generation for women who have been married. The labor force participation has remained stable over generations in the cases of Algeria, Jordan, Tunisia and Palestine. By level of education; we find that the labor force participation has remained stable over generations for females without education and for female with education below secondary and secondary level for all countries. However, for the university level, the results show a significant effect of the cohort in the case of Jordan where the participation rate is lower for the youngest generation compared to the oldest one.

Figure 3: Female Participation Rates by Country

	Deaton-Paxson normalization			Maximum entropy approach		
	A) Age Effects	**B) Year Effects**	**C) Cohort Effects**	**A) Age Effects**	**B) Year Effects**	**C) Cohort Effects**
Algeria						
Egypt						
Jordan						
Palestine						
Tunisia						

6. Conclusion

The findings of this paper about FLFP are useful in several aspects. They are particularly important for understanding the constraints and drivers of low FLFP rates in the MENA region, and constructing policies to increase participation. This paper will help to develop stylized facts about the labor markets of the MENA countries considered. A comparative policy perspective across countries will be particularly important for the policy makers to develop policies to increase female participation in the economy which is of utmost importance for the MENA to realize its developmental potentials. The methodology adopted in this paper illustrates the advantages of performing a cohort analysis to disentangle long-run trends in labor participation.

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ANNEX

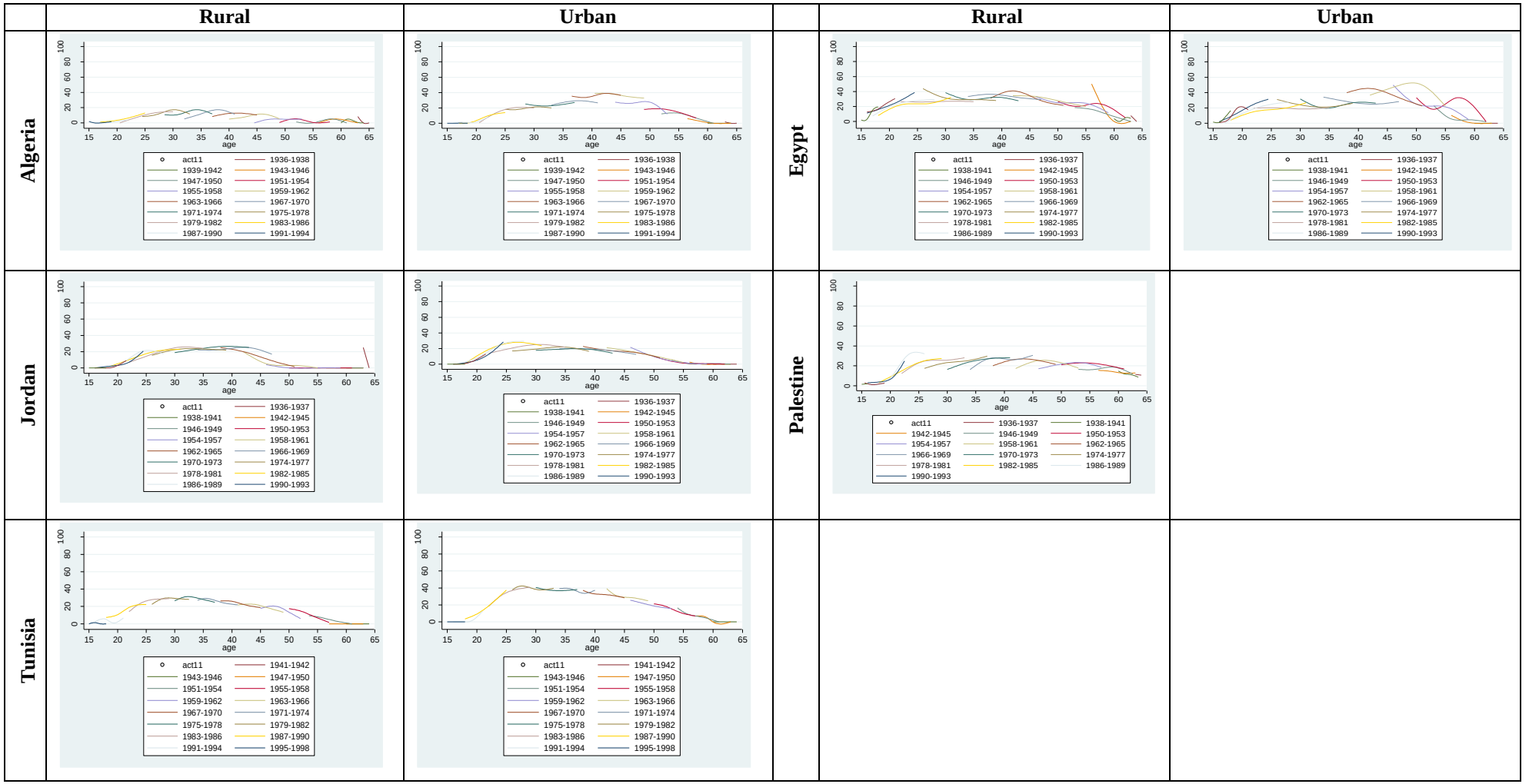
Table1: Changes in FLFP for a given cohort by country

Example	Algeria	Egypt	Jordan	Palestine	Tunisia
1942 – 1945	6	14	5.8	8.7	6.1
1958 – 1961	16.5	41.6	22.6	18	28.8
1970 – 1973	20.3	37.3	32.9	19.9	41
1978 – 1981	19.8	34.1	29.5	20.4	41.7

Source: Computed by the authors.

ANNEX

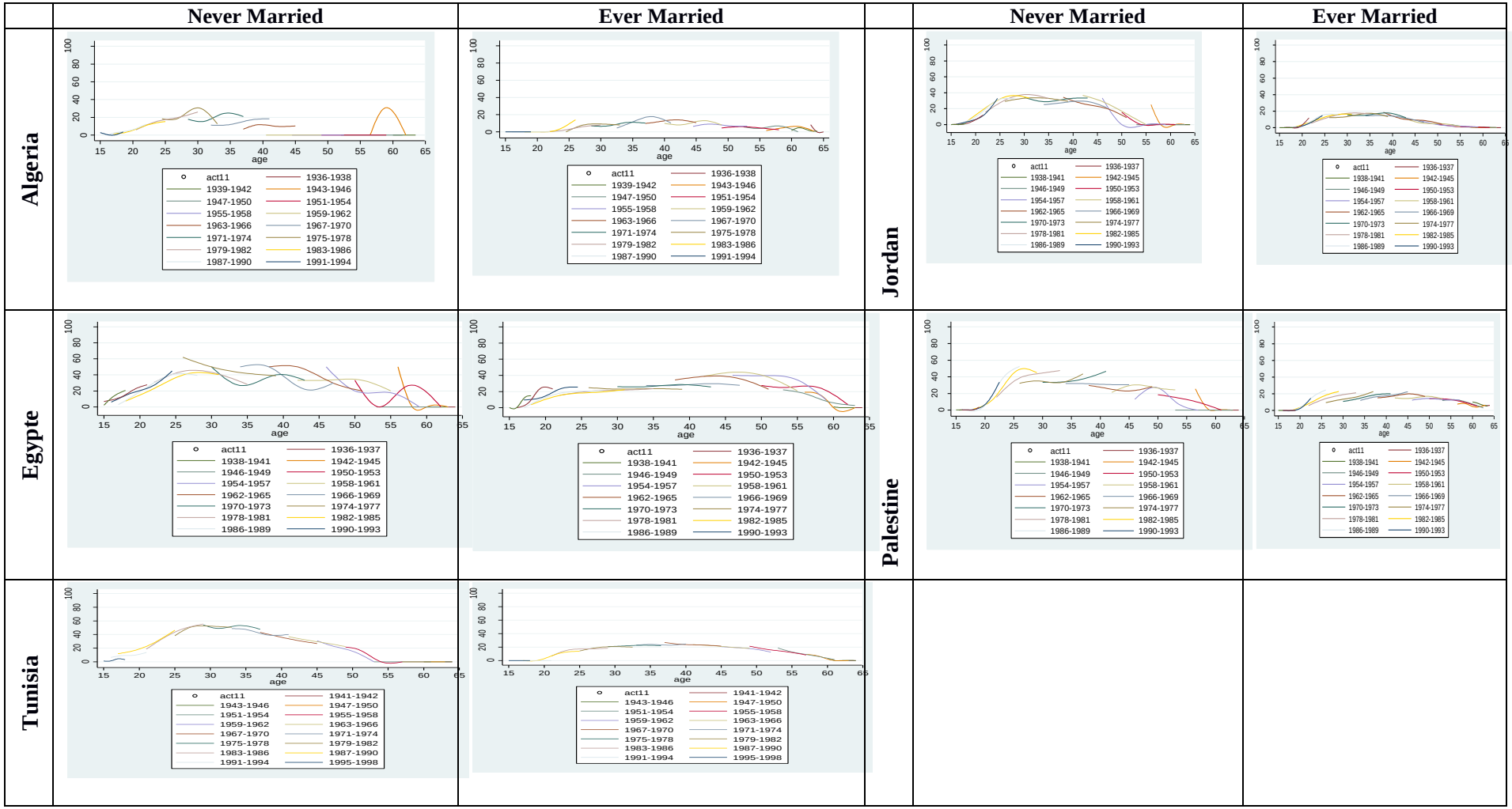
Figure 1: Female Participation Rates by Country & Urban vs Rural – Cohort



Source: Computed by the authors.

ANNEX

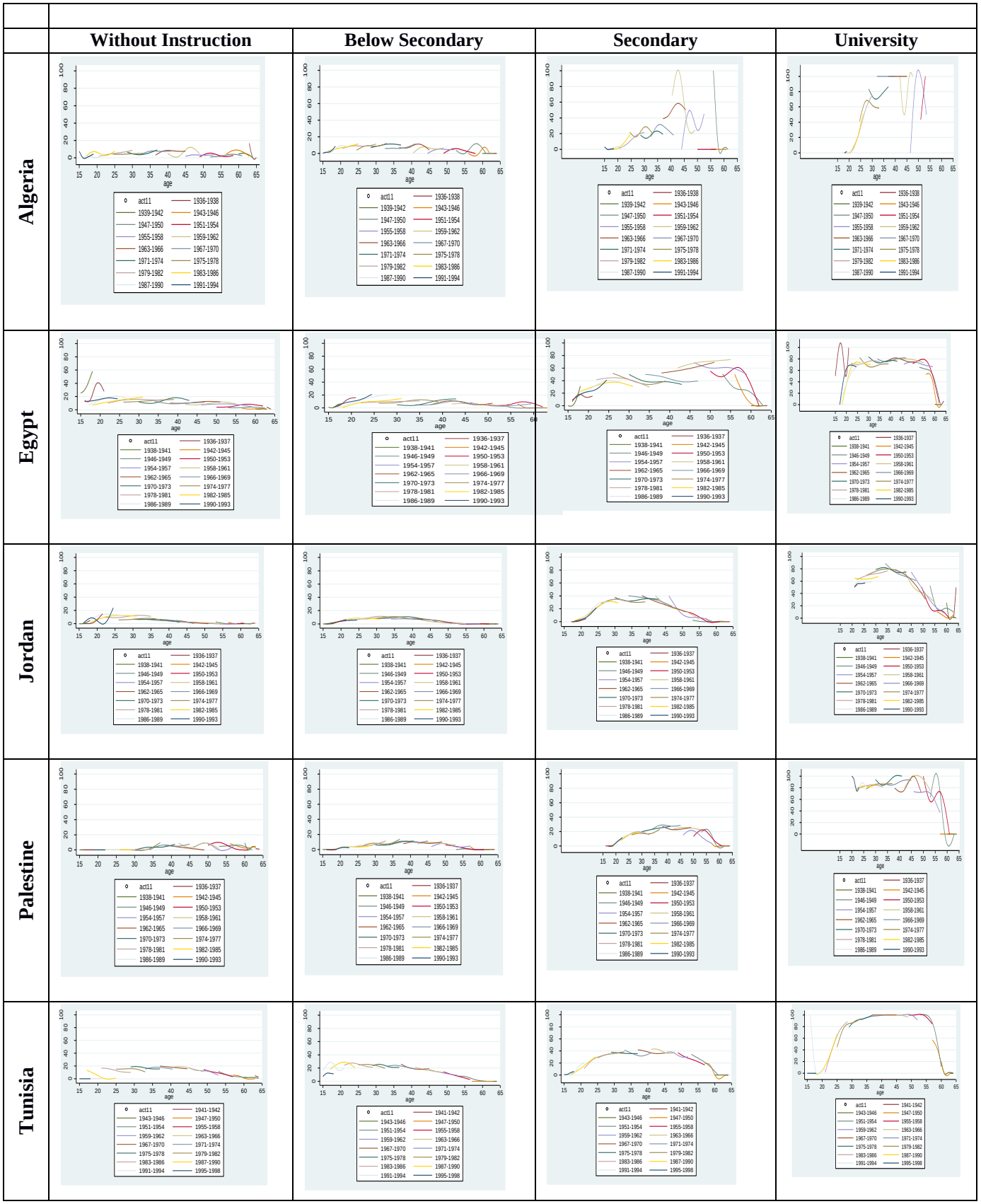
Figure 2: Female Participation Rates by Marital Status & Country



Source: Computed by the authors.

ANNEX

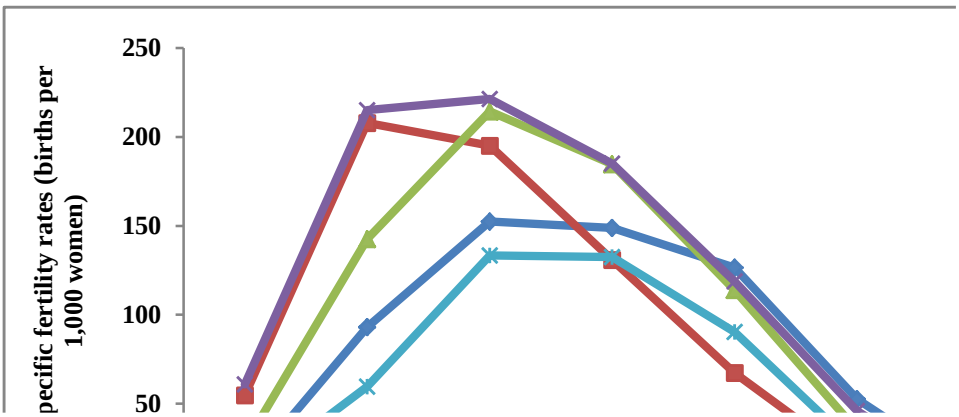
Figure 3: Female Participation Rates by Country & Education Level - Cohort



Source: Computed by the authors.

ANNEX

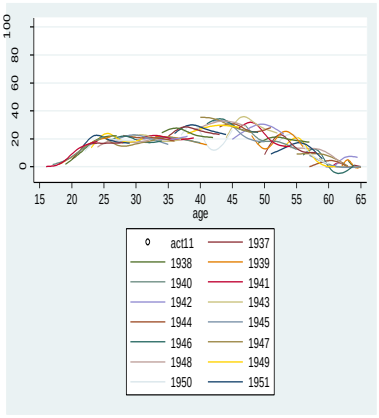
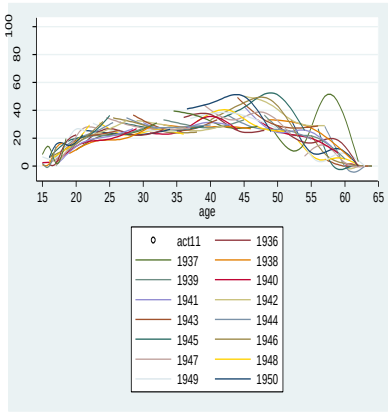
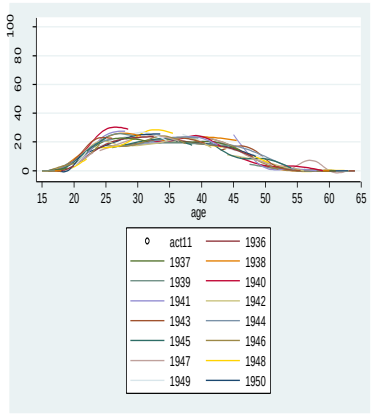
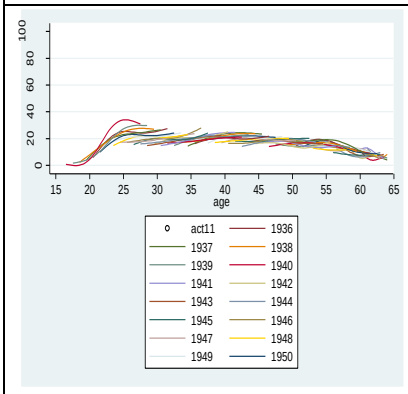
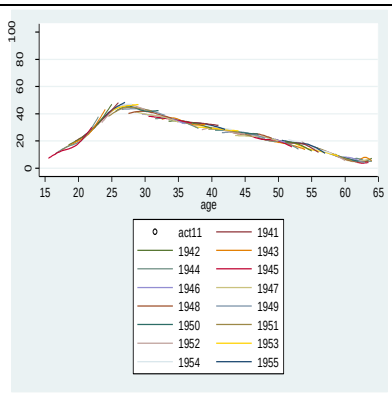
Figure 4: Age-specific fertility rates (births per 1,000 women)



Source: Computed by the authors based on data from United Nations.

ANNEX

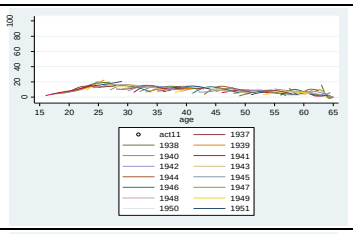
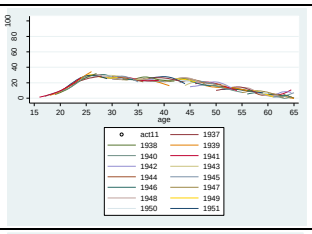
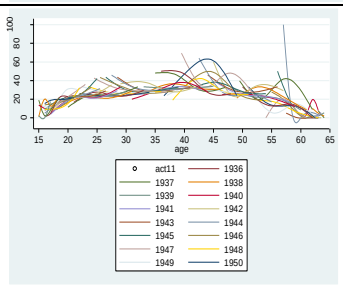
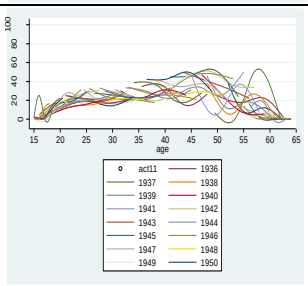
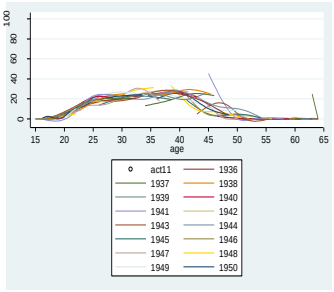
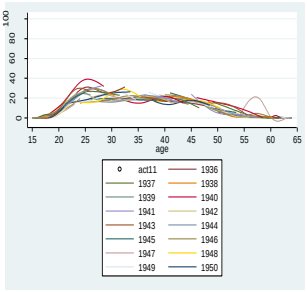
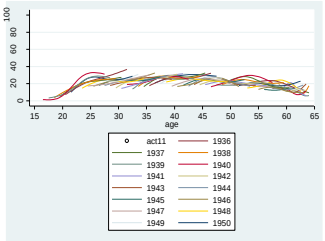
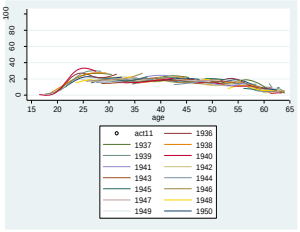
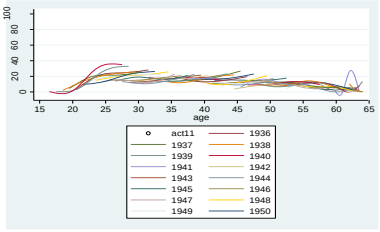
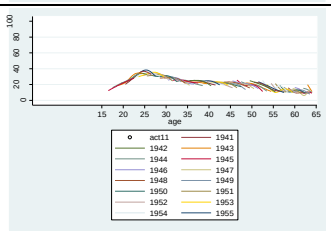
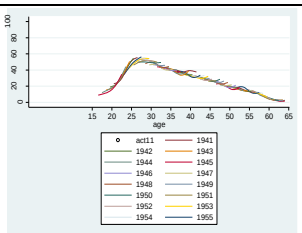
Figure 5: Female Participation Rates by Country - Birthday

Algeria	Egypt	Jordan
		
Palestine	**Tunisia**	
		

Source: Computed by the authors.

ANNEX

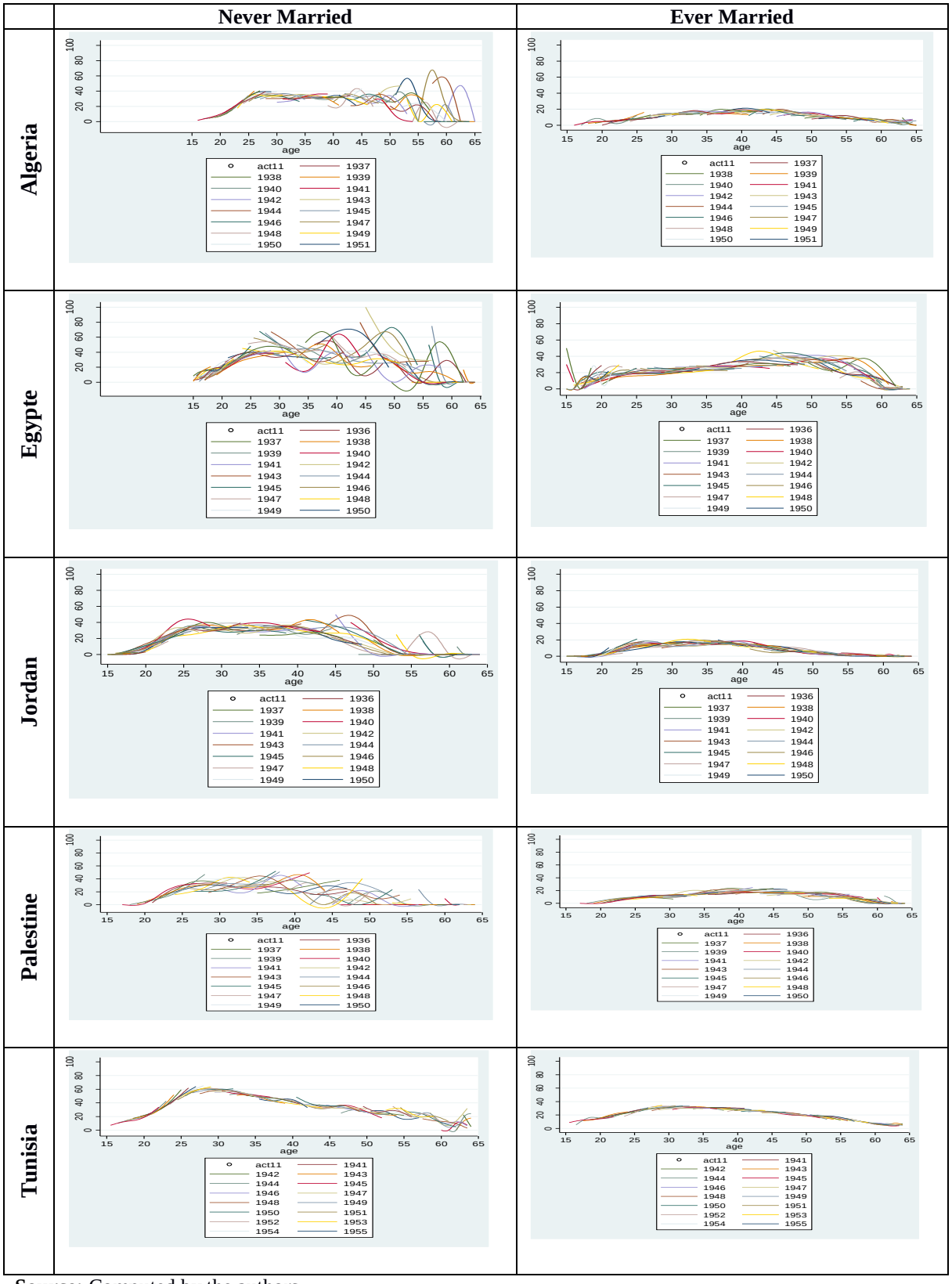
Figure 6: Female Participation Rates by Country & Urban vs Rural - Birthday

	Femme – Rural	Femme – Urban	Femme – Refugee camps
Algeria			
Egypt			
Jordan			
Palestine			
Tunisia			

Source: Computed by the authors.

ANNEX

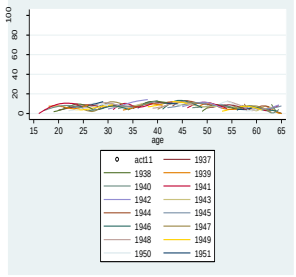
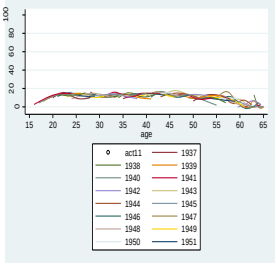
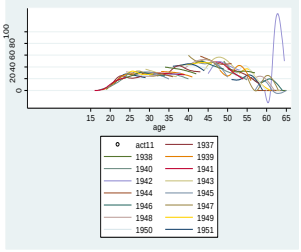
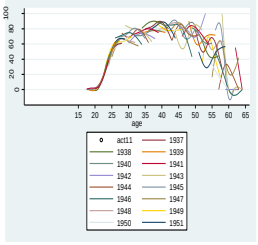
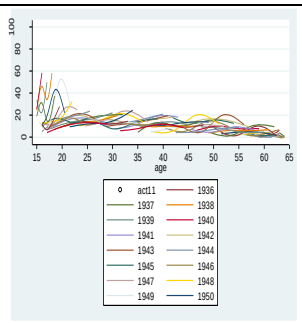
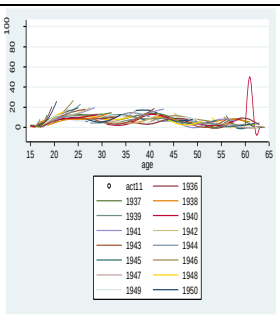
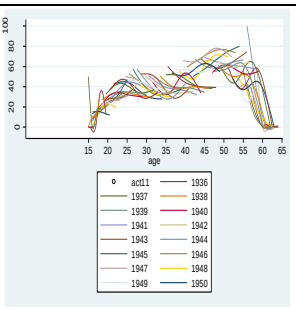
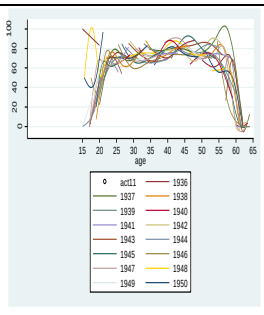
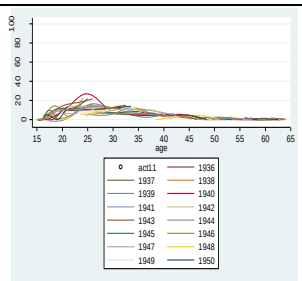
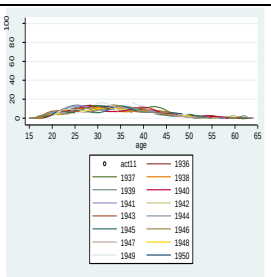
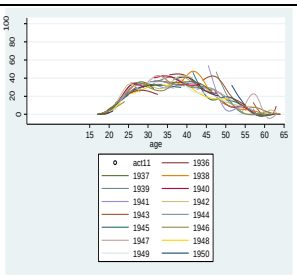
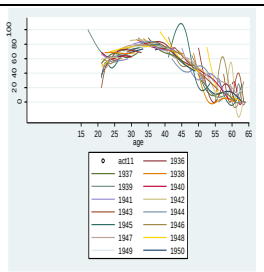
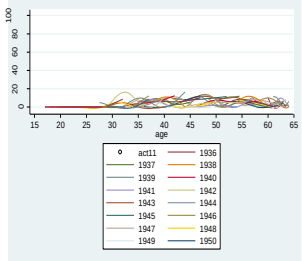
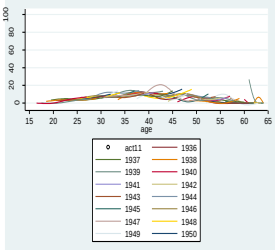
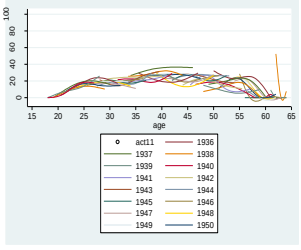
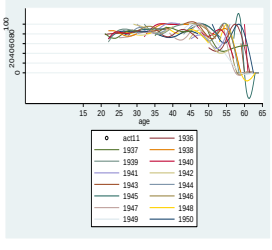
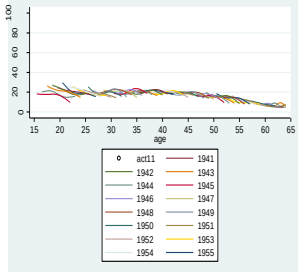
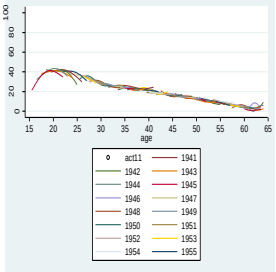
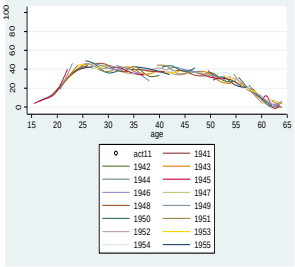
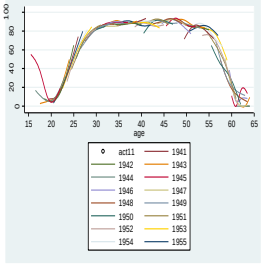
Figure 7: Female Participation Rates by Country & Never Married vs Ever Married - Birthday



Source: Computed by the authors.

ANNEX

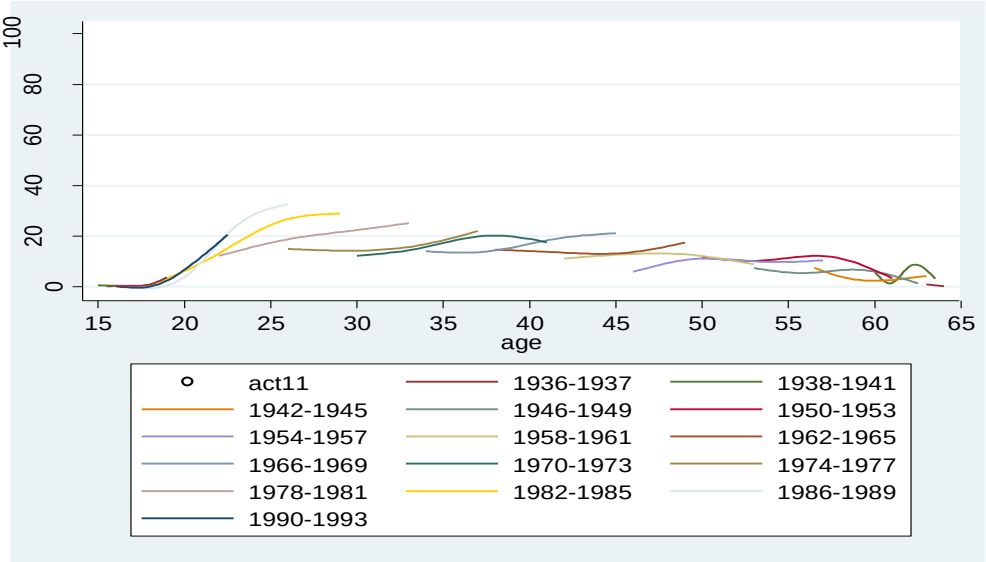
Figure 8: Female Participation Rates by Country & Education Level

	Without Instruction	Below Secondary	Secondary	University
Algeria				
Egypte				
Jordan				
Palestine				
Tunisia				

Source: Computed by the authors.

ANNEX

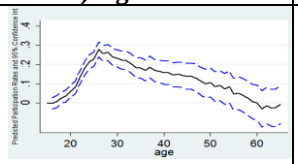
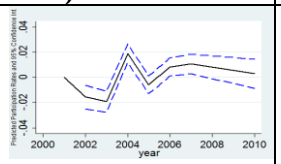
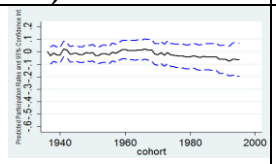
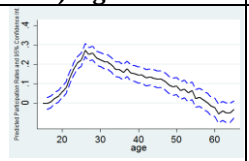
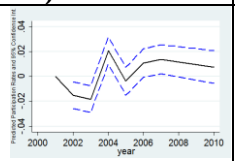
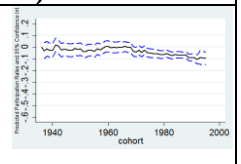
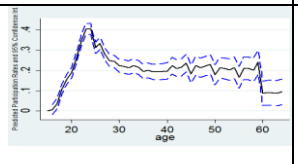
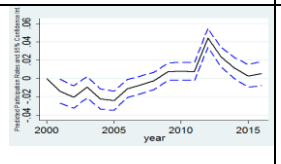
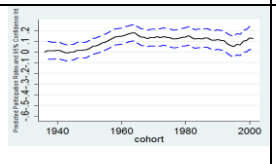
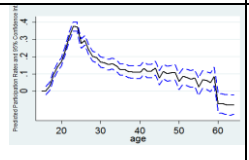
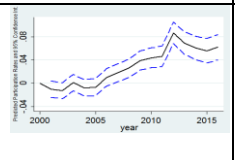
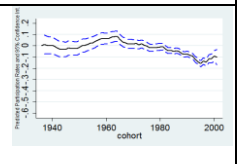
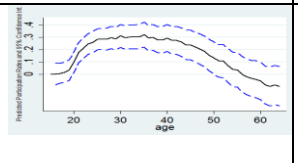
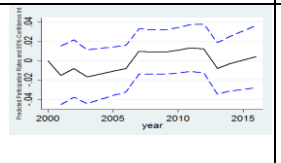
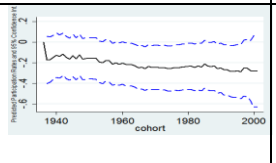
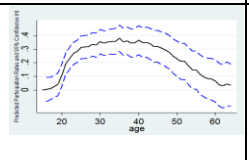
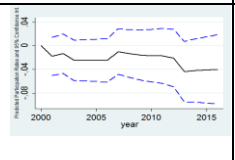
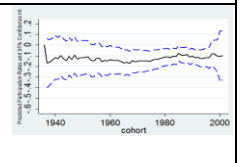
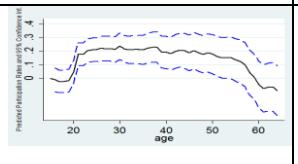
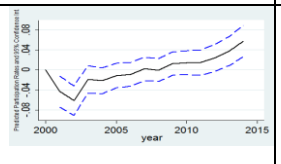
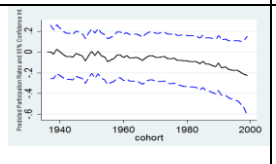
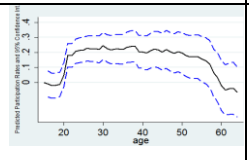
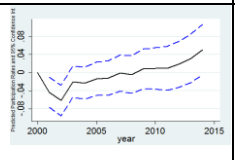
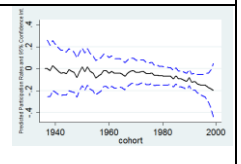
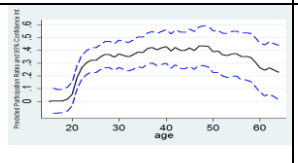
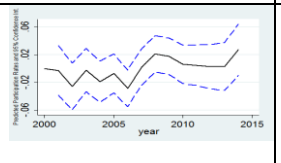
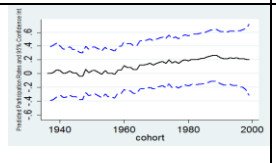
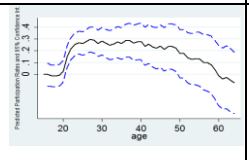
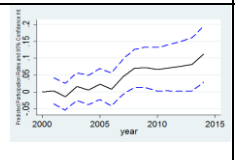
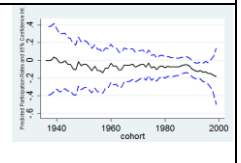
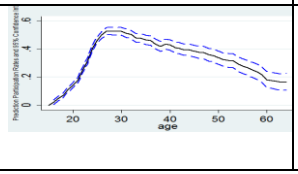
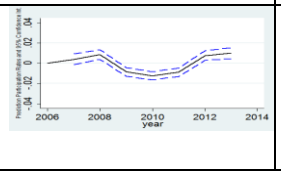
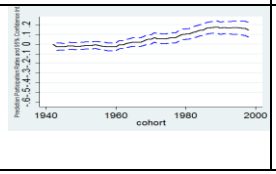
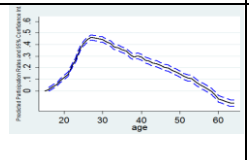
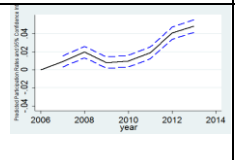
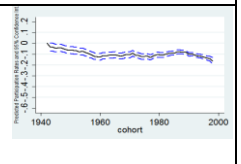
Figure 9: Female Participation Rates Palestine - Refugee camps – Cohort



Source: Computed by the authors.

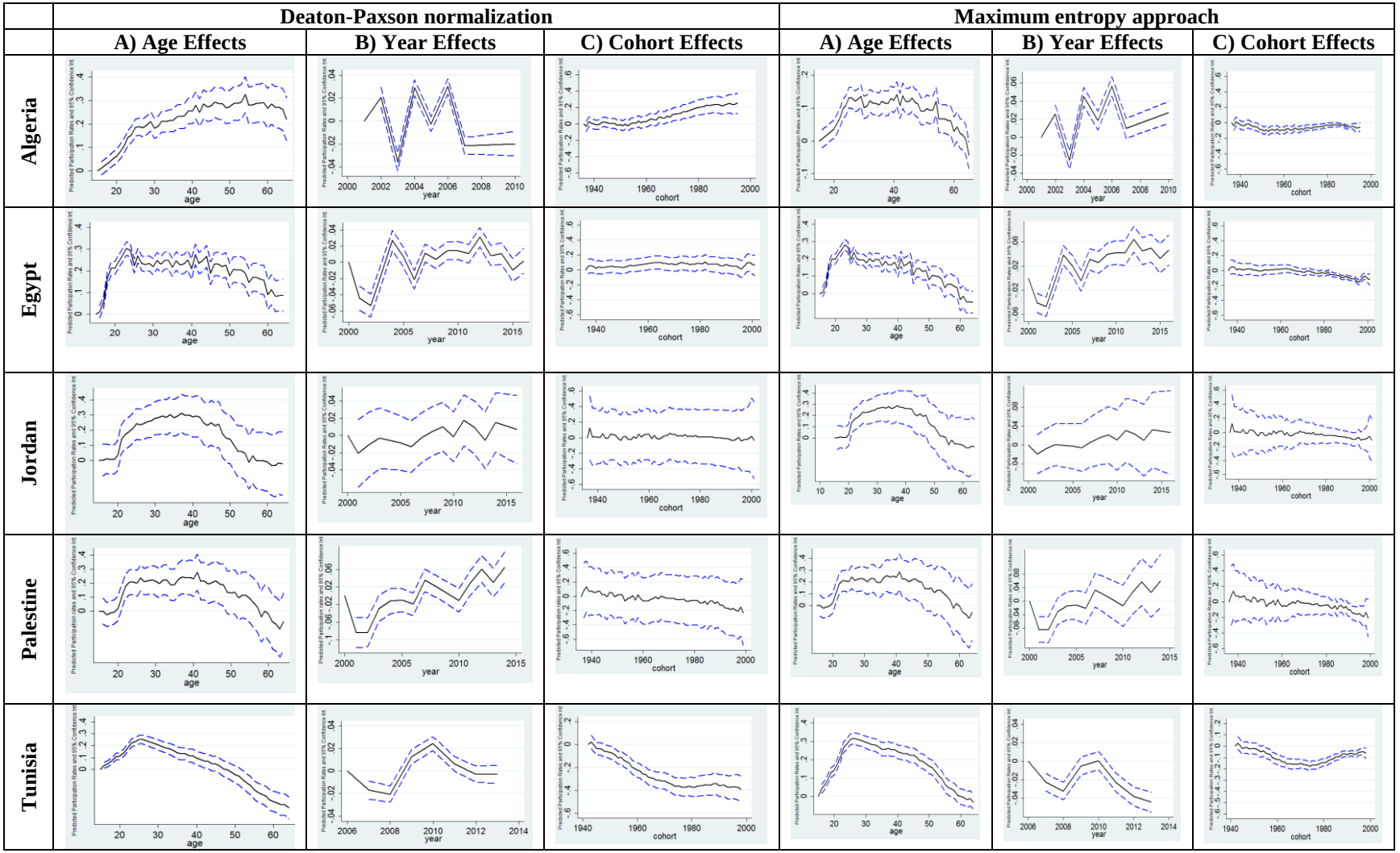
ANNEX

Figure 10: Female Participation Rates by Country - Urban

	Deaton-Paxson normalization			Maximum entropy approach		
	A) Age Effects	**B) Year Effects**	**C) Cohort Effects**	**A) Age Effects**	**B) Year Effects**	**C) Cohort Effects**
Algeria						
Egypt						
Jordan						
Palestine						
Refugee						
Tunisia						

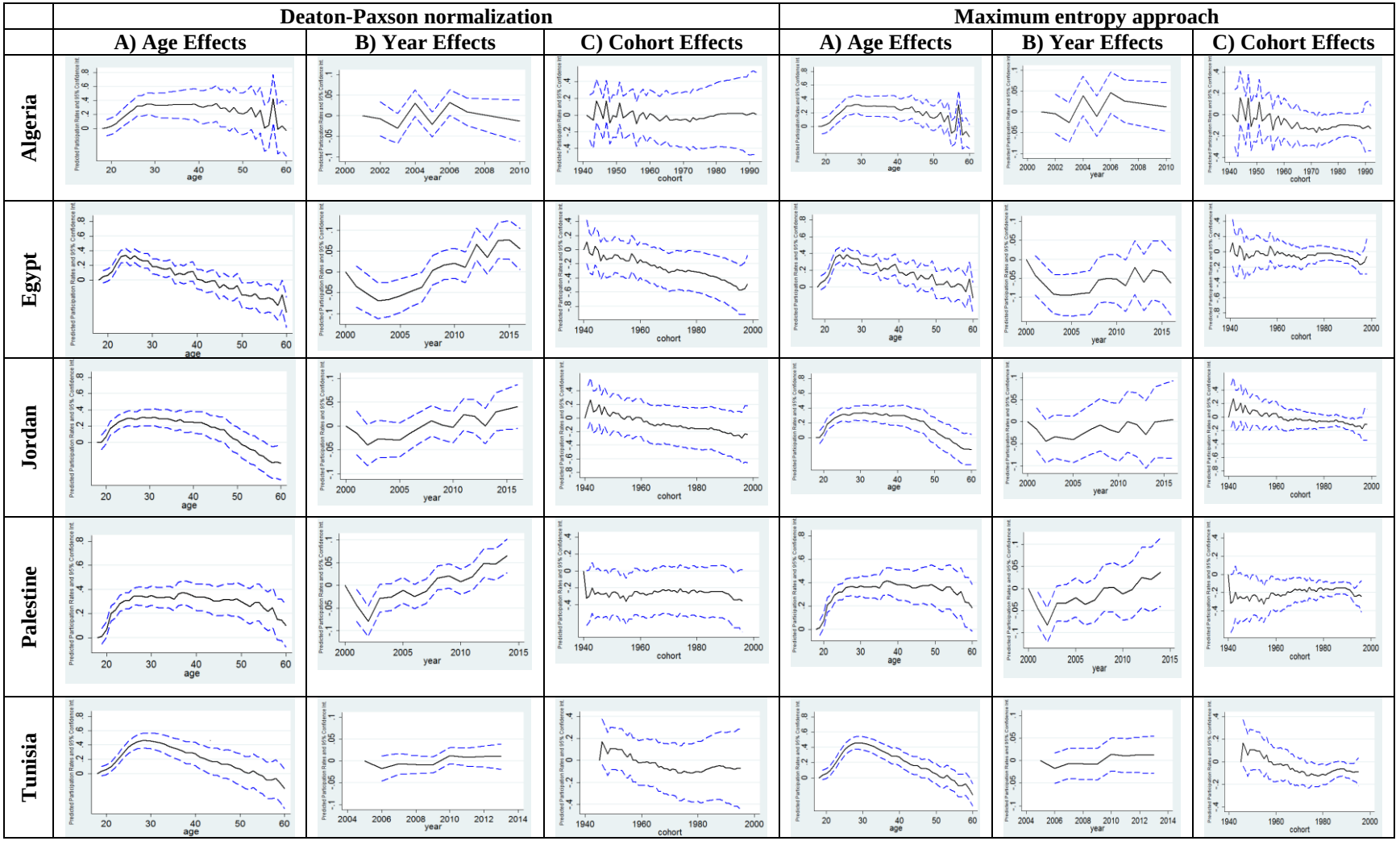
ANNEX

Figure 11: Female Participation Rates by Country – Rural



ANNEX

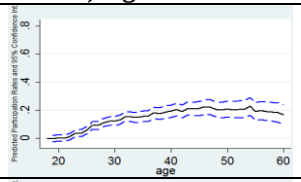
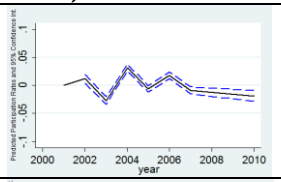
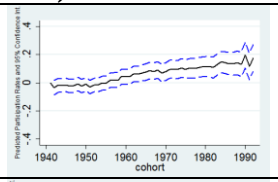
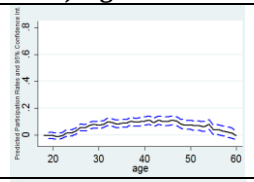
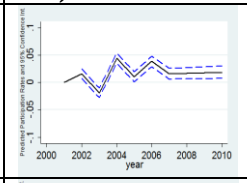
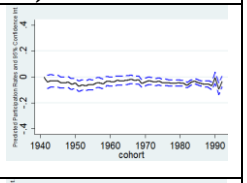
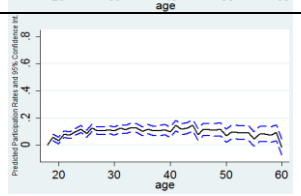
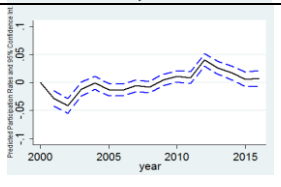
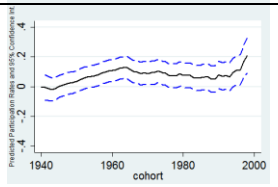
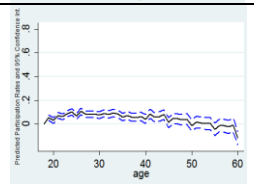
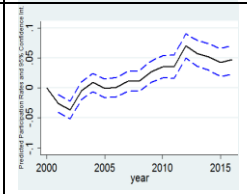
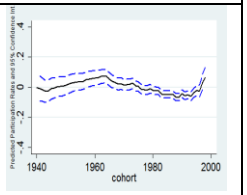
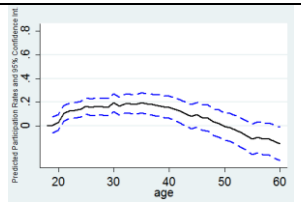
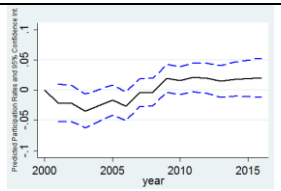
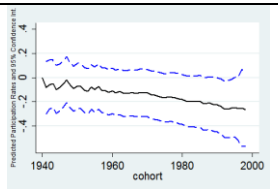
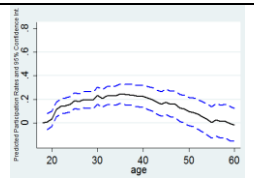
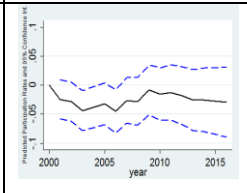
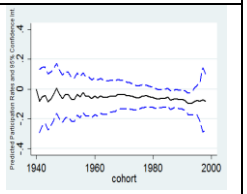
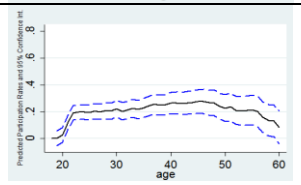
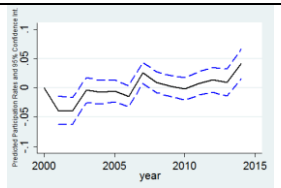
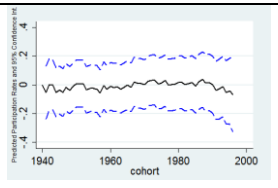
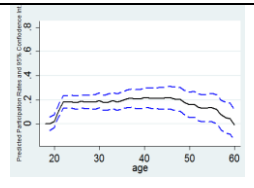
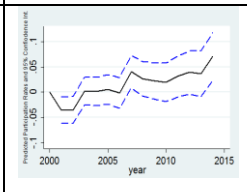
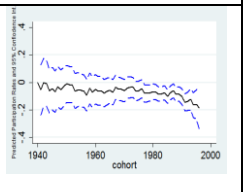
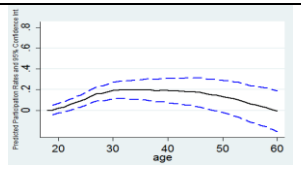
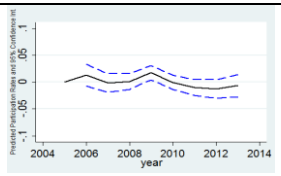
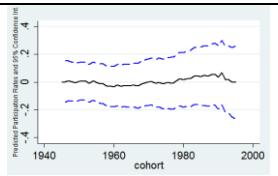
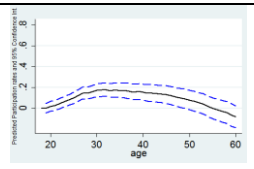
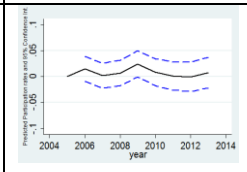
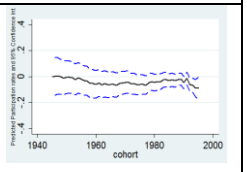
Figure 12: Female Participation Rates by Country - Never Married



Source: Computed by the authors.

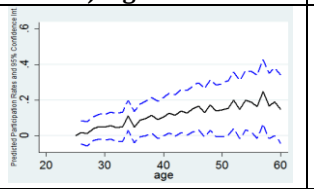
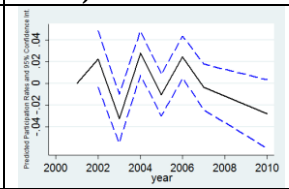
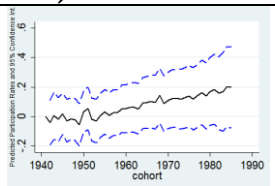
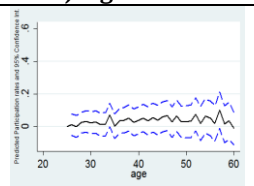
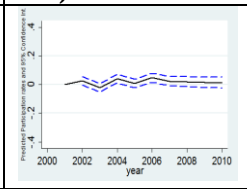
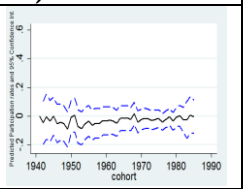
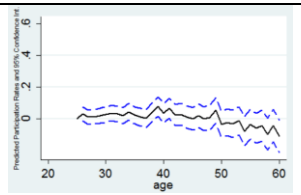
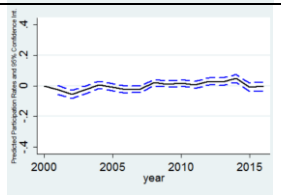
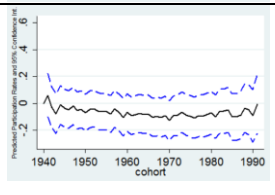
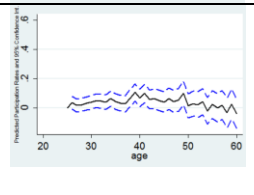
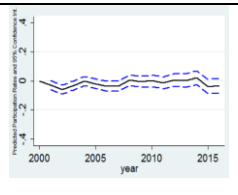
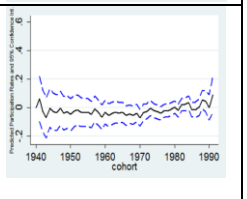
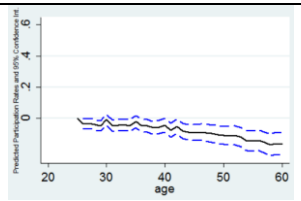
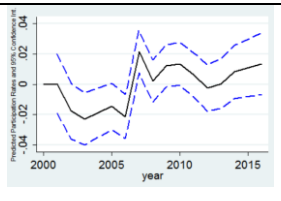
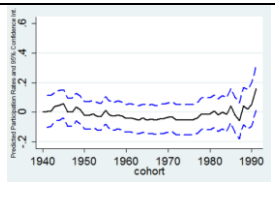
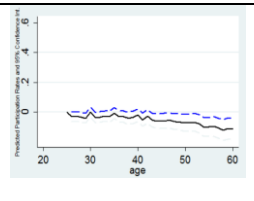
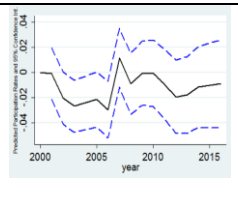
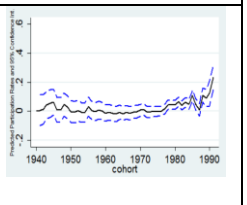
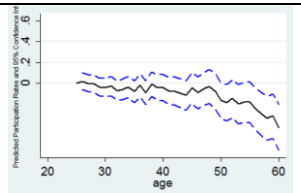
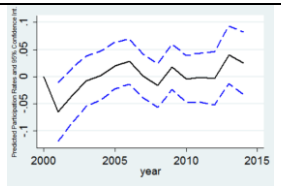
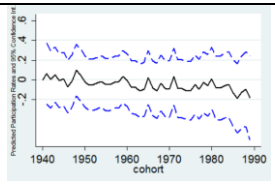
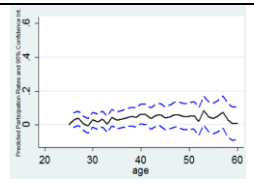
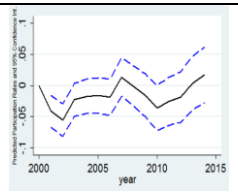
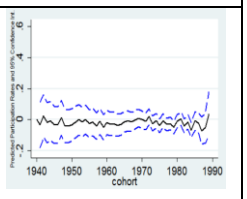
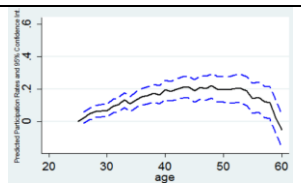
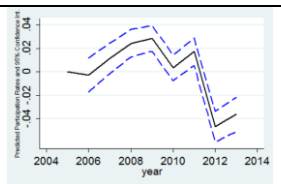
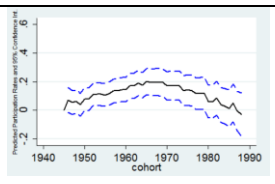
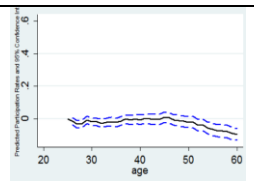
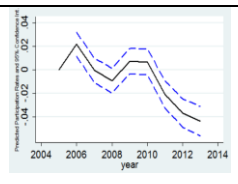
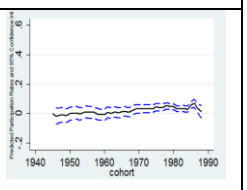
ANNEX

Figure 13: Female Participation Rates by Country - Ever Married

	Deaton-Paxson normalization			Maximum entropy approach		
	A) Age Effects	**B) Year Effects**	**C) Cohort Effects**	**A) Age Effects**	**B) Year Effects**	**C) Cohort Effects**
Algeria						
Egypt						
Jordan						
Palestine						
Tunisia						

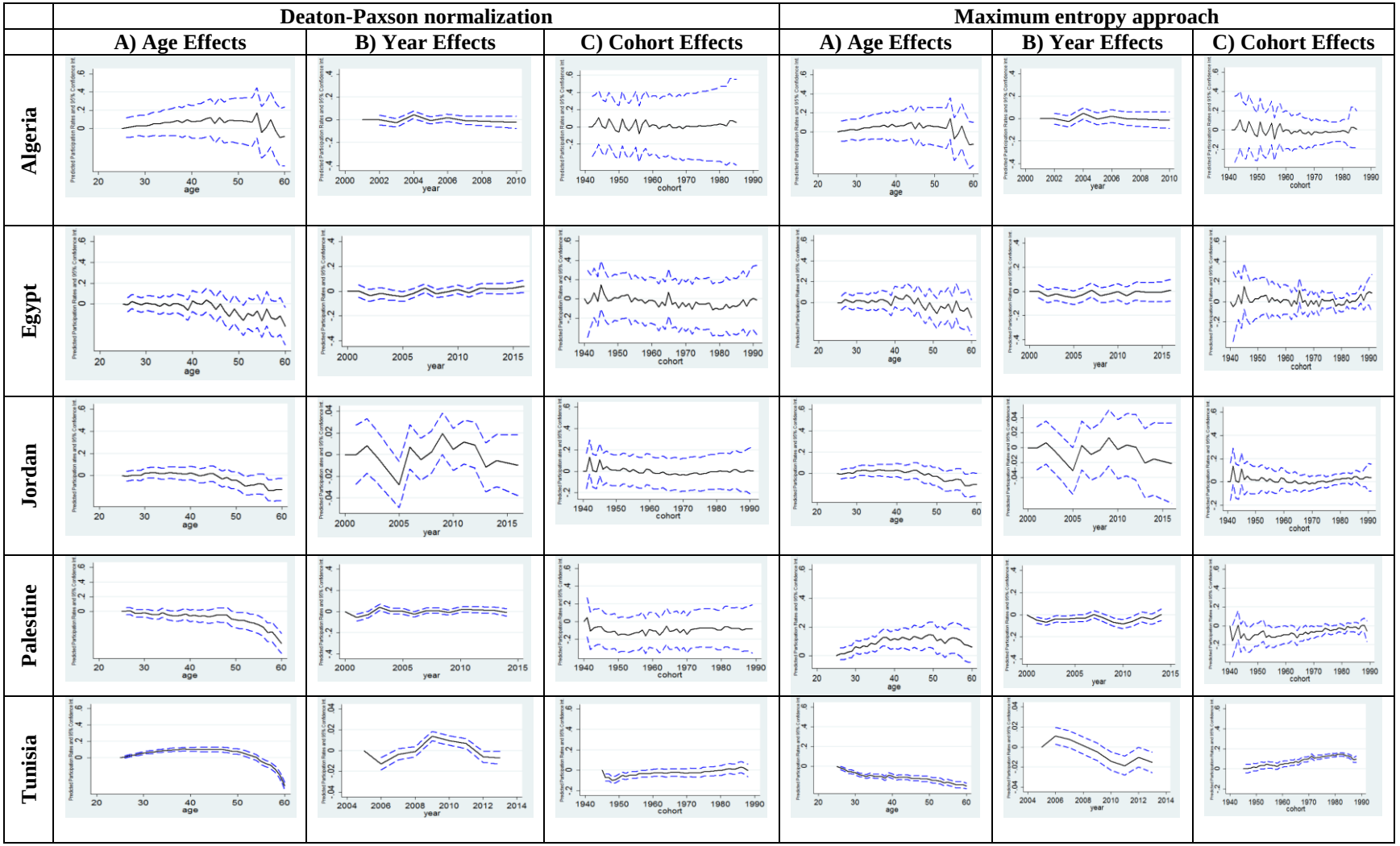
ANNEX

Figure 14: Female Participation Rates by Country & Education Level – Without Instruction

	Deaton-Paxson normalization			Maximum entropy approach		
	A) Age Effects	**B) Year Effects**	**C) Cohort Effects**	**A) Age Effects**	**B) Year Effects**	**C) Cohort Effects**
Algeria						
Egypt						
Jordan						
Palestine						
Tunisia						

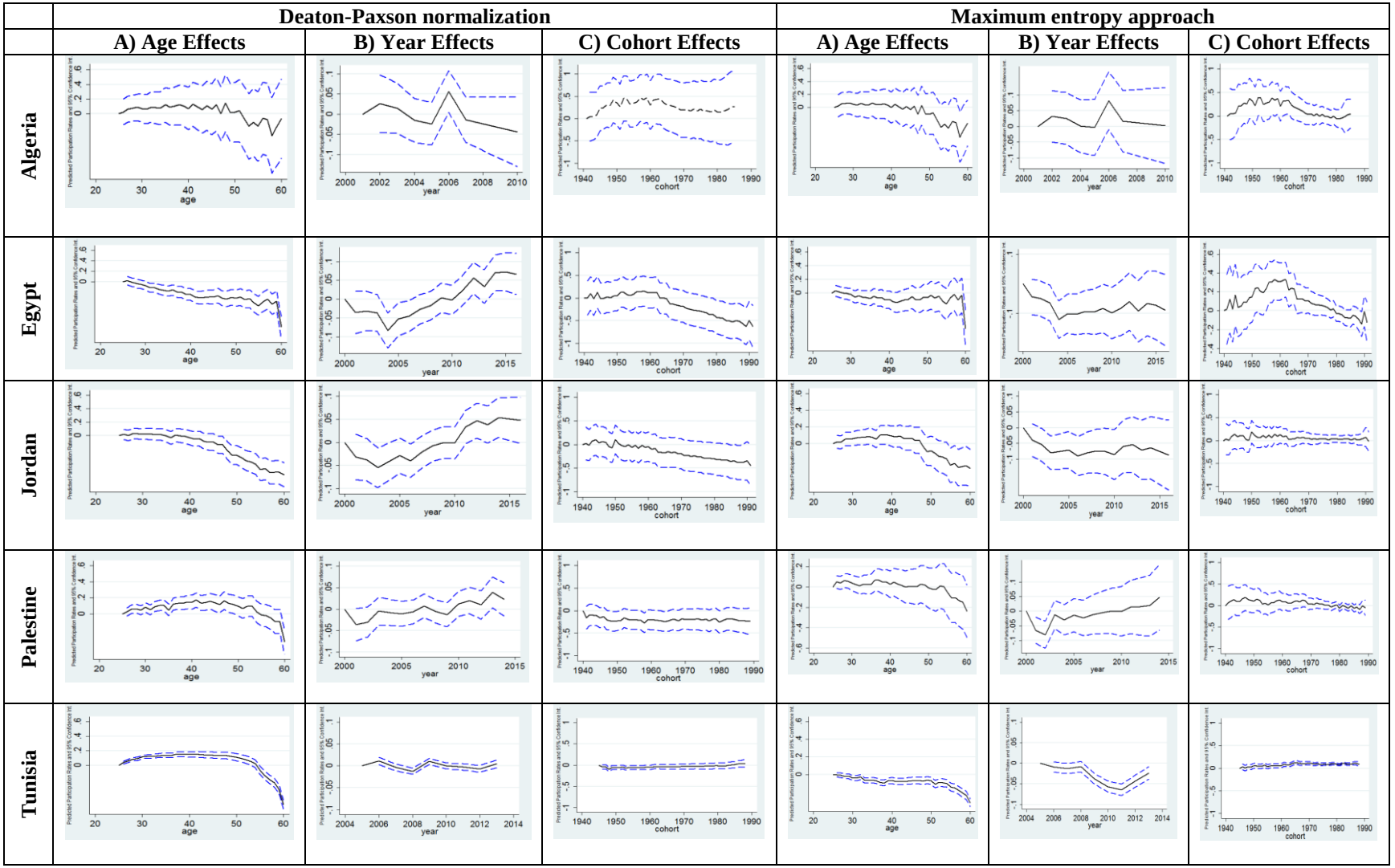
ANNEX

Figure 15: Female Participation Rates by Country & Education Level - Below Secondary



ANNEX

Figure 16: Female Participation Rates by Country & Education Level - Secondary



ANNEX

Figure 17: Female Participation Rates by Country & Education Level – University