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Abstract

This research deals with female labor force participation and its determinants in the Egyptian society using the "Egypt Labor Market Panel Survey" (ELMPS) 2012. More precisely, the paper studies the individual, households and community determinants of the Egyptian woman's decision to enter the labor force. It answered the question on whether these determinants are affecting her decision to be employed or not and to be employed in the public sector or not, once she entered the labor force. Our results show that factors affecting women's labor force participation decision are not the same and may not play the same role for their decision concerning her employment status, once they enter the labor market. Moreover, community context plays an important role in their labor force participation decision, but once an Egyptian woman enters the labor force, community context is not a significant determinant anymore concerning her employment status.

JEL Classifications: J010, J200, J210

Keywords: Employment, labor force, female participation, individual determinants, community context.

ملخص

تدرس هذه الورقة مشاركة المرأة في قوة العمل ومحدداتها في المجتمع المصري باستخدام المسح التتبعى لسوق العمل في مصر لعلم 2012. وبعبارة أدق تدرس هذه الورقة محددات الفرد والأسر والمجتمع لقرار المرأة المصرية لدخول سوق العمل. وأجابت على سؤال ما إذا كانت هذه العوامل تؤثر على قرارها، وعلى عملها في القطاع العام. نتائجنا تظهر أن العوامل التي تؤثر في القوى العاملة وقرار مشاركة المرأة ليست هي نفسها، وقد لا تلعب نفس الدور لقرارها بشأن الوضع الوظيفي لها، بمجرد أن تدخل سوق العمل. وعلاوة على ذلك، يلعب سياق المجتمع دورا مهما في قرارها بالمشاركة في القوى العاملة، ولكن ما ان دخلت المرأة المصرية فى القوى العاملة، لا يعتبر السياق المجتمعي محورا هاما بشأن وضعها الوظيفي.

1. Introduction

Women integration in the economy is very crucial for economic growth and development especially in developing countries. This is very obvious given the fact that increasing women economic integration and empowering women were set as main goals in the Millennium Development Goals (MDGs) (Ackah et al., 2009) which was again confirmed in the course of the Sustainable Development Goals (SDGs).

Female Labor Force Participation (FLFP) is considered to be a main channel through which women are integrated in the economy. FLFP is important for the country's economic efficiency through improving women's relative economic position. Moreover, the stagnation of the FLFP has negative impact on women's bargaining power, her empowerment and the way through which women can benefit from economic growth achieved at the nation macro level, which in turn would negatively affect female and children's health and well being (Ackah et al., 2009 and Klasen and Pieters, 2013).

In Arab countries women are considered to be the unutilized and unrecognized human reserve. FLFP in Egypt, Jordan, Morocco and Tunisia are among the lowest around the World (Spierings and Smits, 2007). In Egypt, where women constitute half of the society, this half faces various challenges, especially at the employment level. According to the Egyptian Labor Market Panel Survey (ELMPS), the rate of unemployed female increased from 23.7% in 2006 to 27.6% in 2012 despite the fact that they only represent 23% of the labor force (Assaad and Kraft 2014). Moreover, Egyptian women labor force participation rate is very low hovering between 20% and 25% during the 2000s, compared to a global average of 52% (Center for Economic and Social Rights, 2013).

Women share in wage employment in non-agriculture sector is very low; additionally almost half of the women in the labor force are in the informal sector suffering from poor working conditions and low wages. Finally although in the public sector, the gender gap is in the favor of women, in the private sector the gender gap and disparities concerning wages remain in the favor of men (UNDP and Ministry of Economic Development 2010). Furthermore, the political and economic crisis, experienced by Egypt since 2011, resulted in a general deterioration of working conditions and an increase of unemployment rates.

Although women's educational attainment is commonly expected to be a main factor in determining FLFP in Egypt and against this expectation, FLFP has fallen substantially in spite of the increasing level of education (Assaad and Kraft, 2013). Women education status in Egypt witnessed significant progress in recent years. The net enrolment ratio reached 96% in 2008/2009, (UNDP and Ministry of Economic Development 2010) and according to the Demographic and Health Survey (DHS), the percentage of female, from 6 to 12 years old; attending school was 88% in 2008. However, almost all unemployed females are educated (94 % of unemployed women reached secondary level in 2012) and after leaving school, 70 % of women are inactive and 15 % are unemployed. Moreover, visible underemployment (involuntarily working less than full-time) increased between 2006 and 2012.

The importance of FLFP at the economic and social fronts together with the poor performance of that rate in the Egyptian context highlight the urgency of studying the main factors that determine FLFP in Egypt. However the empirical analyses tackling this matter is relatively limited (Spierings and Smits, 2007). Hence, this paper is concerned with the determinants of women labor participation in Egypt.

Given that the recent literature on developing countries emphases the different forms of market work that women can engage in and how each of these forms can have different consequences for women ability to combine market work and child care (Hill 1983, 1989, Tiefenthaler 1994, Assaad and El-Hamidi 2001). We are not only interested in determinants of participating or

not, but also in the determinants of the different forms of participation. More precisely, the present paper main interest is Egyptian female employment status, whether employed or unemployed. And if employed; is it public, formal private or informal sector.

Accordingly, this paper aims to study the main determinants of Egyptian women's access to labor market, in order to enhance FLFP in Egypt. Mainly what factors determine women participation in labor force and what type of employment? The answers of these questions will take into consideration individual and households' characteristics, different geographic regions and community context where the women live. The community context is a central contribution of the paper, especially that such factors have been ignored by the Egyptian empirical literature of FLFP. Another important contribution of this research is taking into consideration the endogeniety of fertility as one major determinants of FLFP.

The paper is organized as follows; the first section reviews the literature of FLFP, section two describes the model. The data and estimated resulted will be presented in section three and section four respectively. Finally section five concludes.

2. Literature Review

The standard theory of labor supply is considered the starting point for most models of FLFP (Blundell and MaCurdy, 1999 and Klasen and Pieters 2012). This theory reflects how an individual chooses among alternative uses of his/her time. Accordingly the way in which individuals allocate their time depends on choices between work and leisure in response to a wage increase in what is known as the substitution and income effects (Mincer, 1962 and Fadayomi and Ogunrinola, 2005). However, Mincer (1962) stated that the labor force participation of married women should not be interpreted only on basis of allocation of time between market work and leisure since work at home and child care is another activity which women, on the average, devote a large part of their married life. Consequently, married women face three choices; leisure, work at home and work in the market. (Klasen and Pieters 2012).

Accordingly, their participation decision is based on a comparison of the market wage a woman can obtain and her reservation wage (Killingsworth, 1983; Killingsworth and Heckman, 1986). The reservation wage is related to the opportunity cost of a woman's time spent at home (or in unpaid work and as caregivers), to her unearned income, and to other factors that may affect her preference for paid work relative to other time uses (Assaad and El Hamidi 2002). Accordingly individual characteristics like age, education, marital status or age at marriage, fertility, parental back ground and socioeconomic status were introduced by the empirical literature following this theory as main determinants of labor market participation or supply.

In this context LFP is viewed as an individual decision- making process. Another approach is to view such a micro-economic behavior as a household decision-making process. This latter approach assumes that individual behavioral decisions are made interdependently. Hence, they are part of a larger behavioral framework which links the household's behavior through a process of simultaneous and recursive links. This approach introduces the household level characteristics as important determinant of FLFP.

Beyond the basic standard labor supply theory, macroeconomics factors or demand side factors have been considered in the analysis of FLFP in developing countries (Klasen and Pieters 2012). In this context, levels of economic development have been identified to influence patterns of FLFP in developing countries. Hence, two general theoretical perspectives are recognized, the modernization (or the feminization U-curve) and the world system perspectives (Ackah et al., 2009).

According to the modernization perspective, FLFP follows a U-curve; it first declines and then increases as an economy develops (Goldin, 1994; Mammen and Paxson, 2000). This is a result of a combination of structural change in the economy, income effects, and social stigma against

women work in manufacturing. On the othe4r hand, the world system perspective, explains the labor force participation according to the traditional comparative advantage international trade theory. Accordingly, in the case of developing countries that usually have a comparative advantage in producing unskilled labor-intensive goods, global trade liberalization is expected to raise the demand for and relative returns of the abundant factor; unskilled labor particularly young and single females (Krueger, 1983; Harrison, 2005)[1].

Finally, the level of employment security is another demand side factor that may determine female participation rates. Accordingly, growing labor market flexibility and diverse forms of insecurity encourage greater female labor force participation (Standing, 1999). Hence local demand factors including structure reforms, labor market laws and regulations, national growth rate, norms and cultural at both the nation macro level and the miso subnational or regional level are considered main determinates of female labor force participation.

Empirically various attempts have been made to find measurable variables to reflect the determinants of female labor force participation. These determinates could be identified on three levels, the first and second levels reflect supply side factors while the third level captures demand side factors. The first level includes individual characteristics such as, age, marital status, education, presence of children, household size, wage/income, migration status, health etc. The second level is household characteristics such as relationship to head, husband's occupation, husband's income, husband's employment status for married women. And finally the third level is the labor market macro-variables or the demand side factors such as, the level of unemployment, level of urbanization, type of employment, agricultural employment, proportion of children enrolled in school (Standing and Sheehan eds., 1978; Magidu, 2010). Moreover, female participation depends also on non-economic factors as culture and norms. This include cultural models of the family and men and women's social roles; masculine and feminine models transmitted by the family of origin; the presence or absence of a working mother; and parents who were critical or uncritical of the gender order (Contreras and Plaza, 2010).

A wide range of the available international empirical literature focused on the supply- side factors, mainly individual and household-related characteristics as determining factors of FLFP using household survey data (Mincer, 1962; Gronau, 1973; Heckman, 1974; Killingworth and Heckman, 1986; Prieto- Rodríguez and Rodríguez-Guitiérrez, 2003; Greenwood et al., 2005; Kahora, 2010; Karaoglan and Okten, 2012; Klasen and Pieters, 2012, Dante et al. 2005, Parsons 1980; Aaronson et al., 2006; Sackey 2005; Duncan et al.1993; McElroy 1985; Ali Khan and Khan 2009; Nam 1991 and Aromolaran, 2004). The evidence suggests that women's education, her age, marital status, timing of marriage, number of children or fertility, children ages, and husband's employment status, occupational characteristics of labor supply and living in rural areas are important explanatory variables of female labor market participation in the labor market.

Some issues need to be highlighted here; first the timing of marriage although is expected to affect FLFP; it is almost always not considered as a determinant of participation. The usual practice in the literature is to include marital status as a set of exogenous dummy variables or to limit the estimation of the participation or labor supply function to married women. Second, the exogeniety of marital status can be questioned since participation in the workforce before marriage may delay women marriage. Third, exogeniety of the number and age of children in the home can also be called into question, the recent literature showed these variables may be endogenous and can therefore result in biased estimates (Schultz 1978, Dooley 1982, Moffit 1984, Hotz and Miller 1988, Nakamura and Nakamura 1985, 1992 Mroz (1987) Xie (1970).

[1] Since more females than males tend to be unskilled and female labor is usually cheaper than male labor, labor-intensive industries tend to be relatively dominated by females, particularly those who are young and single (Ackah et al., 2009).

Instrumental variable methodology has been used to address the endogeneity of fertility in the participation decision (Nakamura and Nakamura 1992). Instruments used included sources of unplanned births (like the presence of twins) (Rosenzweig and Wolpin 1980), the availability and cost of contraceptive technology (Rosenzweig and Schultz 1985) and abortion legislation (Bloom et al 2009).

For household level determinants, Mincer (1962) and Nam (1991) show that household income is one of the main determinants of participation in the labor force particularly among females. The main conclusion is that an increase in one individual's income may not result in a decrease in her hours of work, but in those of other family members. Aminu (2010) and Fadayomi and Ogunrinola (2005) focused on the effect of household structure mainly household size, status in the household (head, non-head), relationship to the head, and gender of head of household (female-head, male-head) as determinants of FLFP. For example Aminu (2010) showed that the presence of elderly female persons may decrease or increases the probability of labor force participation depending on the sector of employment being private or public respectively

Fewer other studies focused on the demand-side factors as main determinants of FLFP. Accordingly, institutions, macroeconomic environment, informalization and firm characteristics are identified among the factors that affect female labor force participation (Blanchard and Wolfers, 2000; Lee et al., 2008; Abe 2011; Pissarides et al. 2005; Buchanan et al. 2010). Several conclusions are worth noting, a combination of supply-side and demand-side factors explains the FLFP rates in most studies, employers' preferences and characteristics where firms do not offer enough jobs that attract women to participate in the labor market would also contribute to low FLFP rates, and informalisation resulted in an absolute and relative increase in the use of female labor (Standing 1989 and 1999; Cerruti 2000; Cagatay and Berik 1991; Meagher 1995; Valodia 2001; Floro and Schaeffer 1999 and Mehra and Gammage, 1999). Other studies investigated the feminization U-curve perspective; they examine the implications of economic growth for women's participation in the labor force (Goldin, 1995; Mammen and Paxson, 2000; Tansel, 2001 and Tam, 2011). The results supported the U-curve hypothesis.

Finally, there is also international evidence regarding the importance of cultural factors in affecting female labor participation (H'madoun, 2010; Heather, 2003; Contreras and Plaza, 2010; Vella, 1994; Farre and Vella, 2007; Fernandez et al., 2004; Kawaguchi and Miyazaki, 2007; Fernandez, 2007 and Giavazzi et al., 2009). Variables used by these studies included religious variables, variables reflecting men's attitudes toward family and the distribution of roles among the different genders, female attitudes towards women work, female investment in human capital, parental background through its impact on men's attitudes towards women's work. Results confirmed that these variables are statistically and economically important determinants of the employment rate of women.

Similarly, female labor market participation in the Middle East and North Africa is the subject of a growing empirical literature with results that are mostly in line with the international literature (Hayo and Caris, 2013). Most of the studies in the MENA literature tackling supply side factors as main determinant of FLFP focused on single countries. Shah and Al-Qudsi (1990); Nasser and Mehchy (2012); Chamlou, Muzi and Ahmed (2011) looked at the individual and demographic characteristics of female labor force participation, They confirmed the positive impact of higher education and financial need on participation rate and the negative impact of marriage, youth, living in urban areas and having a middle level of education.

Eltigani (1990) and Al-Qudsi (1998) focused on the impact of household structure and fertility in addition to individual characteristics on FLFP. The results indicated that fertility measured by number of children in the household has a negative impact on women's participation rates.

Other factors that were found to impact the probability of female labor force participation include, woman's level of education, and socioeconomic status of the head of the household.

Studies including the demand side factors as determinants of FLFP confirm that not only supply-side factors but also demand-side factors help explain the low MENA female labor participation rate. These factors included economic development and gender inequality (Fakih and Ghazalian 2013; Tansel 2001, Eltigani 1990, firm-related factors (Fakih and Ghazalian 2013), gender segregation in the labor market and constrained geographical mobility (Yanik and Assaad 2004).

Spierings and Smits (2007) highlighted the importance of explicitly identifying determinants of FLFP at different levels including individual, context and national levels. They used representative data covering five MENA-countries (Egypt, Jordan, Morocco, Syria and Tunisia). Many different factors at both the individual and local district level were found to be important in shaping women's employment. Moreover, the influence of education is most important, but its influence differs significantly by context. Spierings, Smits and Verloo (2007) extended the idea of context to time, national and global developments by examining how globalization affects women's employment chances and also other factors that affect women's employment. Results confirmed that of Spierings and Smits (2007); women's employment is determined by many different factors and dimensions from different levels, including processes of economic liberalization. Moreover, these determinants power depends on the context.

Some other recent studies focused on the effect of culture and social norms on FLFP in the MENA region. Assaad, Hendy, and Yassine (2012) for Jordan. Hayo and Caris (2013) for (Algeria, Egypt, Iran, Iraq, Jordan, Morocco, and Saudi Arabia) and Witte (2011) for six Gulf Cooperation Council member countries. Their results confirmed the general view of the literature that it is the interaction between conservative social and cultural norms about gender roles in the household and in society, on the one hand, and economic and policy-related factors, on the other hand that determine FLFP.

As for Egypt, the empirical literature tackling FLFP is relatevly limited and suffers from some gaps that will be discussed in what follows. Assaad and El-Hamidi (2002) examined how female labor supply in Egypt- mainly participate in paid work and the hours spent in such work- responds to market wages, unearned income, and other individual and household-level characteristics, such as educational attainment, age, and family structure. Employing the 1988 Egyptian Labor Force Sample Survey (1988 LFSS), they use a two steps procedure introduced by Killingsworth and Heckman (1986), where in the first step a selectivity-corrected reduced-form wage and hours equations are estimated and in the second step, structural versions of the labor supply equations is estimated by introducing predicted wage as a regressor in the hours equation. Results showed that the estimated elasticities of female labor supply were pretty high relative to those found in other studies on developing countries. Marriage had a negative effect on both the level of female labor supply, and the extent to which labor supply responds to market wages. Moreover in line with the literature, a strong dependence of participation in paid work on educational attainment was detected, with a big jump appearing at the technical secondary level. However, most of the education effects turned negative, with the exception of the technical secondary and technical institute effects as they controlled for wages.

While Assaad and El-Hamidi (2002) focused only on wage labor, El-Hamidi (2002) extended their work to account for self-employed as data on female participation in developing countries reveal a significant portion of female labor force working for their own account. Using the LFSS (1988) and Egyptian Labor Market Survey (ELMS 1998) she examined the factors that affect female choices among three employment states; non-employment, self-employment, and wage work in addition to factors that determine the number of hours supplied in each state. Heckman-Lee two-step econometric model is used in this analysis, correcting for two types of

self-selection: selection into the self-employment rather than not participating, and selection into wage work rather than self-employment. The results indicated that the more educated, the more women engage in wage work than to be self- employed. Moreover, divorce rate, the presence of a self-employed worker in the house, and young children, are factors that lead a woman to engage in self-employed activity.

Focusing on demand side factors Assaad (2002a) tested the hypothesis that women's participation in non-governmental paid employment in Egypt is constrained by local industrial structure. He focused on the consequences of women's more limited ability to commute to jobs outside their local communities. He used a probit model to estimate the probability of engaging in non-governmental paid work as a function of individual, household, and district-level variables describing the employment density in various industries. He found evidence that participation is increased by the local availability of jobs in the gender-appropriate sectors like electronic assembly, textiles and garments, personal and community services. The main disadvantage of this analysis is that it cannot fully specify the range of labor market options women face by combining together non- participants, non-wage workers and government wageworkers in order to highlight non- governmental wage work.

Assaad (2002b) and (2004) tackled the impact of structural adjustment through increased deregulation of labor markets and informalisation on FLFP in Egypt. In both papers he tried to explain why the pattern observed elsewhere, where feminization goes hand in hand with informalisation, has not occurred in Egypt. Assaad (2002b) used data from household surveys for the years 1988 and 1998. He provided two explanations; first the impact of oil and oil-related revenues on the structure of labor supply and demand, as substantial flows of rent-based external revenues, acted as main source of foreign exchange earnings, had a negative impact on growth of export-oriented manufacturing which is the sector that accounted for much of the feminization of employment in most other countries. Moreover, some of the important activities where women are over-represented were defeminized during the structural adjustment period. Second, women's limited mobility in a context where mobility is important to access private sector jobs. Assaad (2004) addressed the same question in Egypt but comparing it with Morocco and he confirmed same results as Assaad (2002b).

Finally, Hendy (2011) examined women's marriage and employment choices by estimating a joint dynamic model using data from the Egyptian Labor Market and Panel Survey (ELMPS) of 1998 and 2006 as well as retrospective information from 1990. An advantage of this study is that the model employed distinguishes between four different labor market alternatives.; inactivity, public, private and subsistence employment. The results show greater state dependence for the public than for the private sector. Also, significantly important transitions between the different employment status alternatives are observed. Married women working in the private sector tend to have higher probabilities to move to inactivity than women in the public sector since this latter allow them a better reconciliation between family and professional lives simultaneously. Another contribution of this study is that it tried to account for the endogenous relationship between marriage and employment decisions. She used the median age of marriage in the district where the woman lives as well as the number of sisters she has as instruments for marriage.

According to our review of the literature that addressed female labor force participation in Egypt we have identified some gaps that need to be covered. First, most of the previous work on FLFP in Egypt assumes exogeniety of some of its determinants mainly fertility and marriage. Recent literature has insisted that these variables are possibly endogenous and can therefore result in biased estimates (Schultz, 1978; Moffit, 1984; Hotz and Miller, 1988; and Nakamura and Nakamura, 1992). Studies on Egypt assumed that the number of children a woman has is exogenous to her participation or sector choice decision (Assaad and El-Hamidi

2001, 2002) or simply left that information out altogether, essentially estimating a reduced form model. Moreover, the timing of marriage is almost always left out as a determinant of participation. In addition the exogeniety of marital status can be questioned since participation in the workforce prior to marriage can allow women to delay marriage (Assaad and Zouari, 2003). The international literature attempted to address the endogeniety of fertility in the participation decision by adopting an instrumental variable methodology. The main challenge in doing this has been to identify instruments that influence the fertility decision without also affecting the participation decision directly. In searching for suitable instruments for fertility, microeconomic studies used sources of unplanned births (like the presence of twins) (Rosenzweig and Wolpin, 1980), the availability and cost of contraceptive technology (Rosenzweig and Schultz, 1985), the sex composition of previous births (e.g. Angrist and Evans, 1998) and changes in legislation as instruments for fertility (Klerman, 1999; Levine et al., 1999).

Second, the different ways in which women engage in economic activity is another factor, which complicates the investigation of female labor supply in Egypt (Bloom et al., 2009). Participation in economic activities can take different forms, such as wageworker in public and private sectors, self-employment outside the home; work in family enterprises, home production for purposes of market exchange, and production for purposes of household consumption in primary activities, such as subsistence agriculture and animal husbandry (Anker, 1990). The recent literature on developing countries emphases the different forms of work that women can engage in and how each of these forms can have different consequences for women ability to combine productive work and child care (Assaad and El-Hamidi 2001). For example, self-employment can allow women to generate income while simultaneously caring for their children. Even within wage employment, public sector employment often involves shorter hours than employment in the private sector and often provides child care services that make it more compatible with child bearing (Assaad and Zouari, 2003). According to the ELMPS 2012 around 50% of employed women in Egypt in the age bracket of 15 to 60 years old are unpaid workers while 32%, 10%, 2% and 6% are wage workers in the public sector, wage worker in the private sector, employers and self employed respectively.

It is expected that the determinants of labor supply would have different impacts on the different forms of employment. It is therefore necessary to distinguish between different forms of employment when studying the determinants of participation. This issue was ignored in most of the previous studies that addressed FLFP in Egypt as these studies used binary probit models with the exception of El-Hamidi (2002) and Hendi (2011). A possible alternative to the binary probit model is a multinomial logit specification that can allow for all the relevant options to be specified as separate states as used by El-Hamidi (2002). Still a disadvantage of the multinomial logit approach, however, is the need to impose the independence of irrelevant alternative (IIA) assumption, which may or may not be sustained by the data.

Third, as emphasized by the recent literature culture and social norms are crucial in shaping women's activities. Ideas, norms and values of the society about women's mobility and employment may affect women's decision to go out of the house to work. However, the role of culture and social norms as determinants of FLFP was totally missed in the previous studies on Egypt.

The current paper attempts to address these gaps by estimiating a structural model that takes into account the endogeneity of fertility to the participation decision and by modeling participation as a polychotomous variable that distinguishes between different participation states. In addition variables capturing culture and social norms are included as determinants of FLFP.

3. Methodology

The paper examines the main determinants of female labor force participation (FLFP) in the Egyptian labor market. More precisely, we will study the different factors affecting women's employment status. How we define women's employment status has an important impact on the analysis. For instance, many Egyptian women are engaged in animal husbandry and processing of dairy products for household consumption. Under the market definition of labor force[2], those women are not considered employed (Assaad and Krafft, 2013). Therefore we will adopt the extended market definition. Moreover, working in the public sector is considered as a good opportunity for women since the public sector is considered as a family friendly sector. Therefore a large public sector in the economy may draw more women in the labor force. However in recent years the slowing expansion in the public sector reduced opportunities for female in the labor market pushing women to engage in informal sector or not to participate in the labor force (Klasen and Pieters, 2013 and Wahba, 2009).

Hence, the paper's objective is to study the determinants of FLFP, in addition to the determinants of being employed and working in the public sector, once she entered the labor force. To achieve our objective, the analysis follows three steps. First we study the determinants of FLFP; whether she will participate in the labor force or not. Second, if she decides to participate, we examine if these same determinants affect her of being employed or not. And finally, whether these determinants affect her working in public sector versus the private sector (formal and informal).

It worth noting that an important share of females in Egypt is informally employed in the private sector. Hence studying the determinants of this type of employment in specific is important in the Egyptian context. However, this was not possible and we could not under take the analysis further than the public versus private sector, as there were no enough observations for the formal employment in the private sector.

Therefore three models were estimated. In the first model, the dependent variable is a dummy variable "labor force" that takes value 1 if our respondent is in the labor force, 0 if she is not. More precisely the first step can be written as a probit model as follows:

$$P(labor\ force = 1/X) = \Phi(X'\beta) \quad (1)$$

The regressors, X, include two groups of variables; individual socio economic characteristics and community level characteristics. Individual socio economic characteristics includes variables such as woman's age, her education level, number of kids, parents employment status and husband employment. Woman's educational attainment is expected to increase FLFP as women with higher education level may have higher opportunities for good jobs (Spierings and Smits, 2007).

The number of kids a woman has – or her fertility- is believed to have important impact on her participation decision. The presence of young kids may withhold women from labor force participation. However, there's an inverse relationship between women's work and motherhood. So that both fertility and labor force participation are endogenous household's decisions. Hence, introducing the number of children as regressor may result in biased estimators, as it is an endogenous variable. This endogeneity issue will be solved using instrumental variable (IV) method[3] where we have included the average contraceptive use at the governorate level as an instrumental variable for the number of children as Assaad and

[2] Assaad and Krafft (2013) distinguishes between Market Labor Force that consists of everyone who is either engaged in economic activity for the purpose of market exchange or those seeking such work, and the Extended Labor Force that consists of everyone who is engaged in the production and processing of primary products whether for the market, for barter or for their own consumption, the production of all other goods and services for the market and in the case of households that produce such goods and services for the market, the corresponding production for their own consumption.

[3] An *ivprobit* model will be estimated using stata.

Zouari (2003) and Hendy (2011). Such IV is an indicator of the availability of family planning services in the community where she lives, hence women in communities with higher values of this variable is expected to have lower number of kids as compared to women in communities with lower values of this variable. However this variable is not believed to affect women employment decision directly.

The second group of regressors includes community level variables that reflect average employment, norms and tradition in the community where the woman lives. Social norms are crucial in shaping women's activities. Ideas, norms and values of the society about women's mobility and employment may affect women's decision to go out of the house to work. Therefore, employment variables, at the community level, include the unemployment rate and the share of female wageworkers among all wageworkers at the governorate level.

For community variables reflecting women attitudes towards gender roles in the household and in the society; the model includes the share of women, at the governorate level, who believe that Female Genital Mutilation (FGM) should continue, the share of women accepting violence, the share of women who strongly agree or agree that a woman with full time job cannot be a good mother and share of women who strongly agree or agree that a woman should be financially autonomous. Finally, urban/rural dummy is included as social context may differ from one area to another (Spierings and Smits, 2007, Assaad and Zouari, 2003, Assaad et al, 2012).

The second model consists of studying the likelihood of being employed, once she decided to enter the labor force. More precisely, the model can be written as follows:

$$P(employed = 1/X) = \Phi(X'\beta) \quad (2)$$

Finally, the third model studies the determinants of being employed in the labor sector versus the private one. As model (1) and (2), the third model can be written as follows:

$$P(employed\ in\ public\ sector = 1/X) = \Phi(X'\beta) \quad (3)$$

The vector of regressors, X, in both models (2) and (3) are the same as those included in the first model. However, model (1) includes in addition to the respondent characteristics her parents' employment status. These later were not included in the employment and public sector models as there were no enough observations for the different employment status.

4. Data

Our main data source is the ELMPS (2012). The ELMPS is carried out by the Economic Research Forum (ERF) in cooperation with Egypt's Central Agency for Public Mobilization and Statistics (CAPMAS) since 1998. The ELMPS (2012) is the third round of this periodic longitudinal survey that tracks the labor market and the demographic characteristics of households and individuals interviewed in 2006, both individuals included in the ELMS (1998) and individuals added in 2006, as well as a refresher sample of 2,000 new households to ensure that the data continues to be nationally representative, a total sample of 12,060 households and 49,186 individuals.

The ELMPS is considered a wide-ranging, nationally representative panel survey that covers topics such as parental background, education, housing, access to services, residential mobility, migration and remittances, time use, marriage patterns and costs, fertility, women's decision making and empowerment, job dynamics, savings and borrowing behavior, the operation of household enterprises and farms, besides the usual focus on employment, unemployment and earnings in typical labor force surveys.

Our research focuses on 11385ever-married women, in 10604 households, aged between 15 and 60 years old, with an average age of 36 years old and an average age at marriage of 21 years old (table 1). Concerning the distribution of the sample over the six Egyptian regions;

18.83 % of the sample lives in Great Cairo, Alexandria and Suez Canal, 11.49%, 13.27%, 29.26% and 27.14 % lives in Urban lower, Urban Upper, Rural Lower and Rural Upper Egypt respectively. Finally, 56.52 % of the sample lives in the rural areas.

Table 2 shows the distribution of our sample among different education groups in both urban and rural areas in addition to all Egypt. Allover, around 34% are illiterate. This percentage is lower in urban areas (21.83 %) while it is higher in rural areas reaching 43.31%. Most of females in our sample have secondary education with 32.39%, 35.25% and 30.19% in all Egypt, urban and rural areas respectively.

As for our main variable of interest "women employment status", table 3 shows the distribution of our sample according to employment status and rural urban areas. The data demonstrates that major differences in employment status according to areas are mainly in the category of those employed in the public sector (16.01% for urban areas and 6.54% rural areas) and those informally employed in the private sector (4.66%for urban areas and 10.18% rural areas). While for other employment types place of residence is less important. This suggests that the area of residence is a more important factor in determining type of employment than in affecting the participation decision.

Table 4 highlights the importance of the woman education status as a crucial determinant of both her participation decision as well as her choice among different employment types. This table shows that first the majority of the out of the labor force i.e. non-participants are illiterates or with secondary education (around 39% and 30.5% respectively). Second, most of those employed in the public and private formal sectors are university graduates and above, (50.62% and 48.00% respectively). While the majority of women employed in the informal private sector are illiterates 61.56%. Finally, for the unemployed around 60% have secondary education while 27% are university graduates and above.

Table 5 illustrates mean of the number of children the woman has and employment status. The visual inspection of the data shows that women with high number of children are working informaly in the private sector or outside the labor force. This may suggest that the number of children the woman has affects negatively her participation decision and plays also an important role in her decision concerning the employment type she will engage in.

Table 6 shows that average age of women working in the public sector is the highest while most of the unemployed are from the youngest cohorts.

As for the distribution of the employment status according to regions. Table 7 demonstrates the commonly known regional disparities in this regard. Women formally employed in the private sector are concentrated in greater Cairo (34.38%) while those informally employed in the private sector reside in rural lower and Upper Egypt (35.02% and 38.96% respectively). Women employed in the public sector are highest in Rural Lower and Urban upper areas. Finally, the unemployed and the outside labor force are mainly residing in rural areas. This highlights the importance of the social context and community level factors in affecting women employment status.

The social context and community level variables are drawn from two main sources in addition to the ELMPs 2006. First, the variables reflecting employment at the governorate level were drawn from the IPUMS International based on the Egyptian Population, Housing and Establishment Census for 2006 conducted by CAPMAS and including 7282434 persons.

These include variables; the average shares of female wageworkers, among all wageworkers at the governorate level and the unemployment rate at the governorate level. The average shares of female wageworkers, among all wage workers at the governorate level varies among the different governorates, the highest share is reached in Cairo and Port-Said with 26% of the labor force being female wage workers while Suhag witnessing the lowest share of 9%. While

for the unemployment rate at the governorate level, it is found that Port Said has the highest rate of 27% compared with only 6%, the lowest rate in Beni Suef (Appendix 1).

Second, the contraception use variable and two variables reflecting women's self esteem precisely Percentage of women who accept that a man can beat his wife whatever the reason is and Percentage of women who think that FGM should continue are drawn from the 2008 Egypt Demographic and Health Survey (EDHS) [4]. The 2008 EDHS is a nationally representative sample of 16 527 ever-married women aged 15-49. It was undertaken to provide estimates for key population indicators including fertility, contraceptive use, infant and child mortality, immunization levels, maternal and child health, and nutrition. Moreover, it covered other health topics such as knowledge and awareness of avian influenza, HIV/AIDS and hepatitis C; previous history of hypertension, cardiovascular illness diabetes and liver disease; attitudes and behavior with respect to female circumcision; health care cost and health insurance coverage (El Zanaty and Way, 2009).

Female Genital Cutting (FGM), traditionally known as "circumcision", is a fundamental violation of women and girls' rights (WHO, 2008). Surprisingly, according to the EDHS (2008), an average of 60% and 66% of women in Egypt thought that this practice should continue, in urban and rural areas, respectively. This average rate is 64% all over Egypt. This share reached its maximum of 81% in Aswan as compared to a minimum of 28% in Port Said (Appendix 2). While for the share of women who agree that a man can beat his wife for whatever reason, we found that in all governorate more than 15% of women accept such violence. The highest rate is reached in Qena where 70% of women accept that a man beat his wife.

For the average usage of contraception, Figure (2) shows variation among Egyptian governorates. It reaches the maximum of 74% in Cairo, Suez, Sharkia and Menoufia while it is at the minimum of 38% in Suhag.

Finally, another two community level variables are included in the models; the share of women, in the governorate, who strongly agree or agree that a woman who is full time job is not a good mother and those who strongly agree or agree that a woman should be financially autonomous. Such variables reflect women's perception to their role in the society (Appendix 3). Less than 10% of women think that a woman who is full time job is not a good mother. Only in Menoufia, this rate is 15%. While the rate of those who believe that a woman should be financially autonomous is high than 10% in all governorate, with the lowest rate in Beni-Suef 11% and the highest in Alexandria and Luxor with 26%.

5. Estimated Results

Our analysis focus on ever-married women; married, divorced and widowed. Such restriction of the sample will not yield to an important loss of information given that 78% of women in the Egyptian Labor Market Panel Survey (ELMPS, 2012) are ever married women.

The model includes 11385 ever-married women. Only 37% of the sample is in the labor force. The employed women represent 88% of those inside the labor force. Among those employed, 33% are working in the public sector.

Table Results 1 represents the estimated coefficient of the number of children (fertility) equation for our three models of interest; labor force (Model 1), employment (Model 2) and public sector (Model 3) respectively. Each equation includes all the variables used in our probit equation in addition to the instrumental variable; the average number of contraceptive used at the governorate level.

[4] The EDHS was conducted on behalf of the Ministry of Health by El- Zanaty and Associates. It is the ninth in a series of Demographic and Health Surveys conducted in Egypt as a part of the worldwide MEASURE DHS project, which is funded by the United States Agency for International Development (USAID).

As expected, the higher the average number of contraceptive used at the governorate level the lower the number of kids of the respondents. Moreover, the age has non linear impact on the number of children, higher age cohort women has lower number of children [5]

Woman's education level is a significant determinant of her number of kids. Having higher education level, secondary, post secondary, university or Post University significantly decrease the number of kids, compared with being illiterate.

Father's employment has no significant effect on the number of children his daughter has. While, having a self-employed mother or unpaid family worker mother, increases the number of kids the woman may have when compared with a woman with unemployed mother.

Concerning the husband employment status, the results show that having a present employed husband in public sector or in informal private sector, has a positive significant impact on the number of children compared with a not present husband, in the three models. Moreover, for Model (1), a present husband working in the formal private sector has a positive significant impact on the number of kids. This can be explained by the fact that a present working husband is an incentive to have more kids as they can support them financially.

Concerning community characteristics, living in a governorate with a relatively higher unemployment rate decreases significantly the number of children. This is expected, as higher unemployment and hence more difficulty to get a job increases couple's concerns about the possibility of financing the livelihoods of their children. Result also showed that women leaving in governorates with higher share of women believing the FGM should continue have higher number of children. This could be due to that those women have a mentality that may also believe that having a higher number of children support there status within their family and help them keep their husbands.

Finally, women living in governorates where important share of women strongly agree or agree that a woman should be financially autonomous, have lower number of children.

The estimated number of children is used in the IV probit model for the three samples of interest. Table Results 2 represents the estimated coefficient for the three IV probit models.

Although, the total number of kids a woman has, is found to have no significant effect on the likelihood of her labor force participation in the first model, it is a significant determinant of her employment status in the other two models. Women with higher number of kids are less likely to be employed. But once she is employed, women with more kids are more likely to be working in the public sector. This later is an expected result given that public sector is usually considered to be a family friendly sector as compare to the private sector.

Similarly, for age, it is not a significant determinant of the decision of entering the labor force. However, once in labor force, the probability of being employed increases with age. And among the employed, young women are less likely to work in public sector.

Respondent's education status is not playing a significant role in her labor force participation decision. Once she is in the labor force, any education level, compared with being illiterate, decreases the likelihood of being employed versus the unemployed. This could be due to that in recent years and with the stagnation of the employment in the public sector the factors that determine employment of women versus being unemployed is the demand side factors related to private sector employers which is not captured in our model due to data availability. In the third model, among employed women it is more likely that a woman will work in public sector

[5] Such result is confirmed by the raw data as the average number of children increases with the age cohort then decreases for higher cohort (See Appendix 4)

if she has achieved any education level, compared to with being illiterate this may further confirm our interpretation of the insignificant impact of education level in the second model.

For Model (1), where parents' employment status is included to explain the likelihood of entering the labor force, father's employment status has no significant impact on his daughter's employment status. However, having a working mother, whatever her type of work is, increases the likelihood of the labor force participation compared with those with unemployed mothers. These results confirm the role played by the mother in her daughter life.

For the respondents, whose husband is present and unemployed or outside of manpower, they are less likely to enter the labor force. This later is expected given that a husband, outside manpower, may need care and attention and given the social assistance given by the government to elderly and handicapped people. For those inside the labor force, in the second model having a present husband working in the public or private sector will increase her likelihood of being employed. While in the third model, among employed women, having a present husband working in the private sector decreases her likelihood of being employed in the public sector.

Concerning community variables related to unemployment, values and norms, it is found that they play an important role in the labor force participation decision, but once the respondent enters the labor force, community context is not a significant determinant anymore concerning woman's employment status. Again this may be due to that while labor force participation decision is affected by the community norms and values the employment status maybe more sensitive to labor demand characteristics.

As expected a respondent living in a governorate with high unemployment rate are less likely to take the decision of entering the labor force. Moreover, the more the women, in the governorate where the woman lives, who believe that a woman with full time job is not a good mother, the less likely she will enter the labor force. This same negative impact was also evidence for the share of women who accept that a man can beat his wife for various reasons.

Surprisingly, the share of women who think that FGM should continue has a positive impact on labor force participation but a negative significant impact on the likelihood of being employed in the public sector. Another surprising result is reached for the share of women who strongly agree or agree that a full time employed woman cannot be a good mother, the higher this share the higher the likelihood of being employed, while living in governorates with high share of women who strongly agree or agree that a woman have to be financially autonomous decreases the likelihood of being employed.

These last surprising results require more investigation; it would be more informative to include community variables at lower administrative levels (*qism* for instance) than governorates given the heterogeneity that may exist inside the same governorate. However this is not feasible due to data limitations.

To summarize, we conclude that our analysis suggests that the factors affecting women's labor force participation decision are not the same and may not play the same role for her decision concerning her employment status, once she enters the labor market.

6. Concluding Remarks

The paper examines the main determinants of female labor force participation (FLFP) in the Egyptian labor market in an attempt to identify policy actions required to enhance women's participation rate. More precisely, the present research main interest is to identify what are the main individual and community level factors affecting Egyptian female labor force participation and whether these same determinants affect the type of employment the woman choose, once she entered the labor force.

Using the ELMPS (2012), our analysis follows three steps. First we employed an ivprobit model to study the determinants of female labor force participation; whether she will participate in the labor force or not. Second, the ivprobit model is used to identify if these same determinants affect her decision to be employed, once she entered the labor force. Third, among the employed women, we study if these same determinants affect her decision of working in the public sector versus the private sector.

Following the literature the respondent's number of kids is used as one determinant of her employment status. The endogeniety issue is solved using as instrumental variable the average use of contraceptive at the governorate where she lives. Her age, her education, level, her father's, mother's and husband's employment are included as well in the model, in addition to region dummies and community characteristics, given their important role in women's decision.

The results show that woman's age, her education and her mother's employment status are the main determinant of female labor force participation in Egypt. Once she is in the labor force, her age and education play a significant role in her being employed versus unemployed and to be employed in public sector versus the private sector.

While the total number of kids a woman has is found to have no significant effect on the likelihood of her labor force participation it is a significant determinant of being employed. Women with high number of kids are less likely to be employed. But once she is employed, woman with more kids are more attracted to the public sector, as it is known that it is a family friendly sector.

Three important conclusions are worth noting. First, mother's employment status plays an important role in her daughter labor force participation. This result demonstrates the importance of the role model played by mothers in the Egyptian community and confirms results reached by the literature concerning the important role of women and their empowerment in their children well being. This highlights the urgency of enhancing female empowerment and economic status as a mean of development.

Second, women education level does not affect her participation decision, but once she decides to enter the labor force, her education plays a significant positive role on being employed in the public sector.

Third, the characteristics of the community context where she lives play a significant role in affecting women's decision in entering the labor fore. But once she is in the labor force, community context is not an important determinant of her employment status.

Hence, the factors affecting women's labor force participation decision are not the same and may not play the same role for her decision concerning her employment status, once she enters the labor market. So the policy actions required to enhance women‘s participation rate would not be the same as those affecting her employment status. Such difference should be taken into consideration by policy makers interested in empowering women and enhancing their economic status

Finally, it is worth noting that FLFP may not only be affected by supply- side factors, mainly individual and household-related characteristics that have been covered in this paper. It may be affected as well by macroeconomics factors or demand side factors. Theses demand factors include structure reforms, labor market laws and regulations, national growth rate, norms and cultural at both the nation macro level and the miso subnational or regional level. This paper accounted for some of these factors mainly norms and cultural at the governorate level, however future research would benefit from including other demand side factors especially at the nation macro level and more community variables at lower administrative level than the governorate one.

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Figure 1: Employment Status and Mean of Number of Children

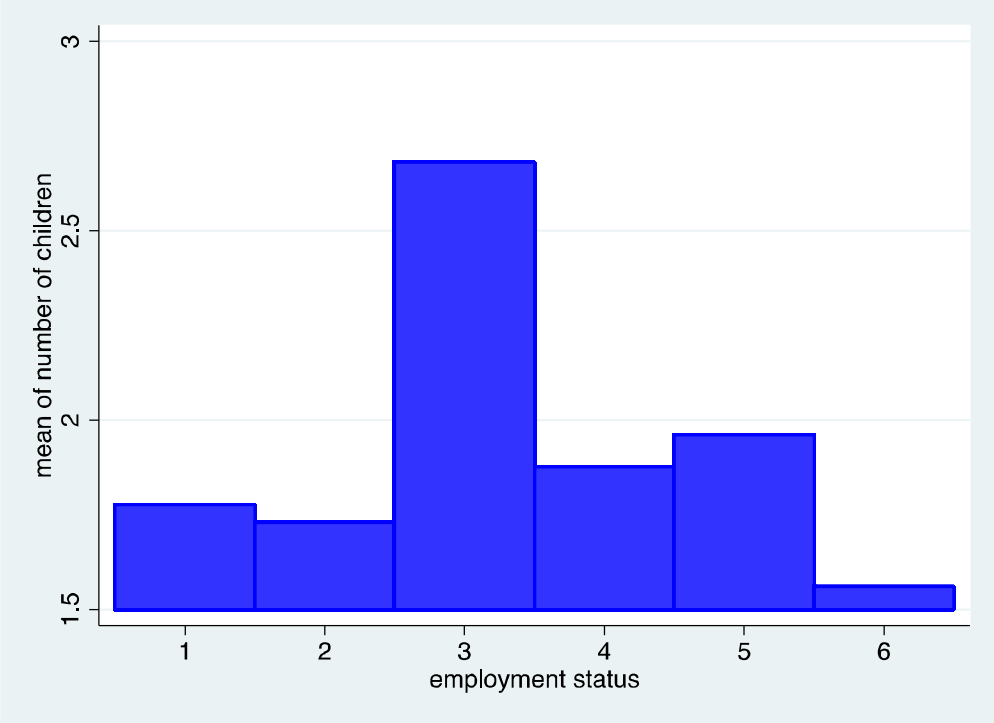
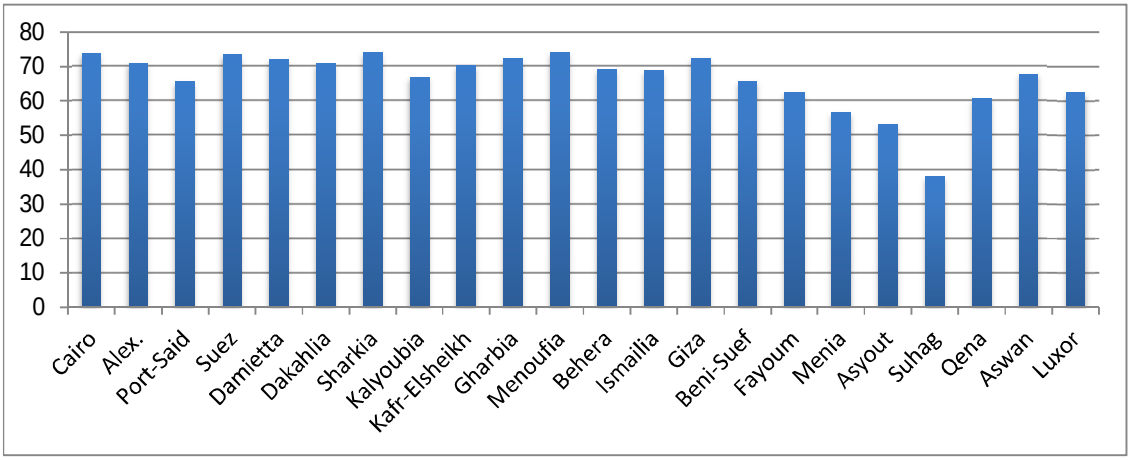


Figure 2: The Average Share Contraceptive Use by Governorate



Source: Computed by the authors from EDHS (2008)

Table 1: Sample Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max
Age	35.75	11.74	15	60
Age2	1416.15	909.19	225	3600
Number of children the woman has	1.99	1.815	0	16
Age at marriage	20.81	3.70	11	38
Ratio of those who agree that a woman with full time job cannot be a good mother	0.053	0.03	0.01	0.15
Ratio of those who agree or strongly agree that a woman should be financially autonomous	0.19	0.04	0.11	0.29
Share of those believing circumcision should continue	0.625	0.15	0.27	0.86
Share of those believing a man can beat his wife for any reason	0.40	0.19	0.09	0.79
Ratio between share of illiterate females to share of illiterate females	1.41	0.13	0.92	1.72
Total Observations		11385		

Source: Computed by the authors from ELMPS 2012 and EDHS (2008)

Table 2: Distribution of the Sample According to the Education Status (%)

Education Status	Urban	Rural	All Egypt
Illiterate	21.83	43.31	33.97
Literate but no basic education	2.64	3.15	2.932
Basic Education: (prim and prep)	14.07	13.82	13.93
Secondary	35.25	30.19	32.39
Post Secondary: Middle Institute	4.68	1.74	3.02
University & post University	21.52	7.78	13.76
Total	100	100	100

Source: Computed by the authors from ELMPS 2012

Table3: Distribution of the Employment Status According to the Urban/Rural Areas (%)

Employment status	Urban	Rural	All Egypt
Employed in public sector	16.01	6.54	10.66
Formal employed in private sector	1.51	0.33	0.84
Informal employed in private sector	4.66	10.18	7.78
Unemployed	5.75	6.77	6.33
Outside the labor force	71.95	75.83	74.14
Outside man power	0.08	0.33	0.22
Total	100	100	100

Source: Computed by the authors from ELMPS 2012

Table 4: Distribution of the Employment Status According to Education Status (%)

Education Status	Employed in Public sector	Formal employed In private sector	Informal employed in private sector	Unemployed	Out of the labor	Outside man power	Total
Illiterate	1.48	7.00	61.56	2.36	38.68	60.00	33.97
Literate but no basic education	0.66	1.00	3.38	0.83	3.40	8.00	2.93
Basic Education	1.65	7.00	11.95	3.74	16.82	28.00	13.93
Secondary	38.83	31.00	19.05	61.30	30.50	0.00	32.39
Post Secondary: Middle Institute	6.76	6.00	0.90	5.13	2.50	0.00	3.02
University & post University	50.62	48.00	3.16	26.63	8.10	4.00	13.76
Total	100	100	100	100	100	100	100

Source: Computed by the authors from ELMPS 2012

Table 5: Employment Status and Mean of Number of Children

Employment status	Mean of # of Children
Employed in public sector	1.78
Formal employed in private sector	1.73
Informal employed in private sector	2.68
Unemployed	1.88
Outside the labor force	1.96

Source: Computed by the authors from ELMPS 2012

Table 6: Employment Status and Mean of Woman Age

Employment status	Mean of Age
Employed in public sector	40.00
Formal employed in private sector	36.89
Informal employed in private sector	38.56
Unemployed	28.29
Outside the labor force	35.43

Source: Computed by the authors from ELMPS 2012

Table 7: Distribution of the Employment Status According to Regions (%)

Region	Employed in public sector	Formal employed in private sector	Informal employed in private sector	Unemployed	Outside labor force	Outside man power	Total
Greater Cairo	14.64	34.38	3.94	12.20	11.22	4.00	10.72
Alex, Suez Canal	12.25	15.63	3.94	9.08	8.21	4.00	8.12
Urban Lower	17.60	11.46	8.45	11.74	10.48	4.00	11.49
Urban Upper	20.81	16.67	10.14	13.53	12.46	4.00	13.28
Rural. Lower	25.49	15.63	35.02	25.40	27.56	52.00	29.26
Rural Upper	9.21	6.25	38.96	28.04	30.07	32.00	27.14
Total	100	100	100	100	100	100	100

Source: Computed by the authors from ELMPS 2012

Table Results 1: Estimated Coefficients for the Children Equation in the Three Samples of Interest

	Model (1)	Model (2)	Model (3)
age	0.676***	0.733***	0.751***
	-0.0216	(0.0241)	(0.0266)
age squared	-0.00891***	-0.00968***	-0.00991***
	-0.00029	(0.000320)	(0.000350)
Her Education Status (Reference: being illiterate)			
literate but no basic education	-0.132*	-0.223	-0.184
	-0.0699	(0.206)	(0.196)
Basic Education: (prim and prep)	-0.0508	-0.0779	-0.0591
	-0.0324	(0.104)	(0.104)
Secondary	-0.353***	-0.464***	-0.438***
	-0.0499	(0.0979)	(0.103)
Post Secondary: Middle Institute	-0.699***	-0.866***	-0.838***
	-0.0925	(0.112)	(0.129)
University & post University	-0.826***	-1.005***	-0.986***
	-0.0931	(0.139)	(0.146)
Father Employment (Reference: No job)			
Wage worker	-0.119		
	-0.163		
Employer	-0.0827		
	-0.155		
Self-employed	-0.154		
	-0.182		
Unpaid Family Worker	0.0326		
	-0.267		
Mother Employment (Reference: No job)			
Wage worker	-0.0601		
	-0.0657		
Employer	-0.194		
	-0.166		
Self-employed	0.170*		
	-0.0988		
Unpaid Family Worker	0.238***		
	-0.0648		
Husband Presence and Employment Status (reference: Husband not present)			
Present and employed in Public Sector	0.448***	0.373***	0.339***
	-0.0571	(0.0746)	(0.0739)
Present and employed in formal Private Sector	0.286***	0.131	0.114
	-0.0596	(0.0858)	(0.101)
Present and employed in informal Private Sector	0.362***	0.308***	0.307***
	-0.0552	(0.0690)	(0.0793)
Present and unemployed or Outside of labor force	0.09	0.157	0.153
	-0.0595	(0.102)	(0.110)
Present and outside manpower	-0.0276	-0.205	-0.220
	-0.0838	(0.201)	(0.203)
Community Variables			
Unemployment rate at the governorate level	-0.0164**	-0.0176**	-0.0199**
	-0.00782	(0.00826)	(0.00903)
Percentage of women who agree or strongly agree that a woman having full time job cannot be a good mother[#]	-0.00847	-0.000426	-0.00585
	-0.00841	(0.0127)	(0.0121)
Percentage of women who agree or strongly agree that A woman should be financially autonomous[#]	-0.0128	-0.0298***	-0.0295***
	-0.01	(0.0112)	(0.0111)
Percentage of women who accept that a man can beat his wife whatever the reason is[#]	-0.166	-0.203	-0.278
	-0.165	(0.190)	(0.176)
Percentage of women who think that FGM should continue[#]	0.433**	0.605***	0.701***
	-0.175	(0.215)	(0.239)
Share of female wage workers among all wage workers at the governorate level	1.194	1.220	1.630
	-0.954	(1.381)	(1.325)
Average contraceptive use at the governorate level	-1.171***	-0.985**	-1.198***
	-0.347	(0.436)	(0.425)
Living in Rural areas	0.217	0.216	0.227
	-0.135	(0.217)	(0.221)
Constant	-8.730***	-9.532***	-9.764***
	-0.588	(0.697)	(0.725)
Observations	11,385	4,205	3,685

Notes: [#] These variables are calculated at the governorate level. Robust standard errors in parentheses : *** p<0.01, ** p<0.05, * p<0.1

Table Results 2: Estimated Coefficient of the IV Probit Models

	Model (1) P(labor force=1)	Model (2) P(employed=1)	Model (3) P(public=1)
Number of children	-0.207	-0.564***	0.547***
	-0.437	(0.129)	(0.0775)
Age	0.238	0.342**	-0.391***
	-0.272	(0.138)	(0.0656)
Age squared	-0.0029	-0.00386*	0.00548***
	-0.00365	(0.00217)	(0.000776)
Her Education Status (Reference: being illiterate)			
Literate but no basic education	-0.108	-0.625***	0.541**
	-0.0991	(0.216)	(0.248)
Basic Education: (prim and prep)	-0.0444	-0.387*	0.521***
	-0.0598	(0.226)	(0.158)
Secondary	0.274	-1.159***	1.426***
	-0.23	(0.392)	(0.349)
Post Secondary: Middle Institute	0.364	-1.424***	1.967***
	-0.446	(0.388)	(0.445)
University & post University	0.721	-1.384***	2.247***
	-0.571	(0.285)	(0.503)
Father Employment (Reference: No job)			
Wage worker	0.0292		
	-0.117		
Employer	0.151		
	-0.114		
Self-employed	0.0406		
	-0.144		
Unpaid Family Worker	0.111		
	-0.261		
Mother Employment (Reference: No job)			
Wage worker	0.243***		
	-0.0814		
Employer	0.480*		
	-0.272		
Self-employed	0.425***		
	-0.119		
Unpaid Family Worker	0.666***		
	-0.12		
Husband Presence and Employment Status (reference: Husband not present)			
Present and employed in Public Sector	0.18	0.392***	0.0499
	-0.193	(0.0726)	(0.133)
Present and employed in formal Private Sector	-0.153	0.173***	-0.143*
	-0.165	(0.0667)	(0.0796)
Present and employed in informal Private Sector	0.0536	0.225***	-0.296***
	-0.17	(0.0591)	(0.0670)
Present and unemployed or Outside of labor force	-0.145*	0.0136	0.00649
	-0.0876	(0.129)	(0.0902)
Present and outside manpower	-0.231***	-0.138	0.245
	-0.0661	(0.282)	(0.155)
Community Variables			
Unemployment rate at the governorate level	-0.0572**	0.0111	-0.00678
	-0.0228	(0.0148)	(0.00897)
Percentage of women who agree or strongly agree that a woman having full time job cannot be a good mother[#]	-0.0379*	0.0448*	-0.00335
	-0.021	(0.0249)	(0.0101)
Percentage of women who agree or strongly agree that A woman should be financially autonomous[#]	0.0263	-0.0401***	0.0107
	-0.0226	(0.00926)	(0.0151)
Percentage of women who accept that a man can beat his wife whatever the reason is[#]	-1.081**	0.286	-0.187
	-0.425	(0.282)	(0.222)
Percentage of women who think that FGM should continue[#]	1.189**	-0.504	-0.830*
	-0.478	(0.730)	(0.465)
Share of female wage workers among all wage workers at the governorate level	-0.544	1.364	-0.928
	-1.982	(1.455)	(1.087)
Living in Rural areas	0.344	0.510**	-0.339
	-0.293	(0.252)	(0.207)
Constant	-4.659	-3.893	4.585***
	-3.551	(2.475)	(1.161)
Observations	11,385	4,205	3,685

Notes: [#] These variables are calculated at the governorate level. Robust standard errors in parentheses : *** p<0.01, ** p<0.05, * p<0.1

Appendix 1: Average Share of Female Wageworkers among the Labor Force and Unemployment Rate at the Governorates Level (%).

Governorate	Share of female wage workers	Unemployment rate
Cairo	26	17
Alex.	20	17
Port-Said	26	27
Suez	20	17
Damietta	15	12
Dakahlia	15	14
Sharkia	15	14
Kalyoubia	14	13
Kafr-Elsheikh	17	14
Gharbia	21	16
Menoufia	13	8
Behera	17	7
Ismailia	17	15
Giza	23	12
Beni-Suef	12	6
Fayoum	16	12
Menia	15	9
Asyout	12	11
Suhag	9	11
Qena	17	11
Aswan	18	16
Luxor	16	13

Source: computed by the authors from Census (2006)-IPUMS

Appendix 2: Average Share of those Believing Circumcision Should Continue and Average Share of Contraceptive Use at the Governorates Level (%).

Governorate	Share of those who accept that a man can beat his wife for any reason	Share of those believing circumcision should continue
Cairo	24	44
Alex.	23	44
Port-Said	19	28
Suez	37	72
Damietta	33	37
Dakahlia	41	76
Sharkia	19	77
Kalyoubia	48	65
Kafr-Elsheikh	17	67
Gharbia	29	63
Menoufia	17	74
Behera	63	39
Ismailia	22	67
Giza	33	68
Beni-Suef	56	71
Fayoum	51	68
Menia	42	54
Asyout	59	57
Suhag	63	70
Qena	70	75
Aswan	53	81
Luxor	63	79

Source: computed by the authors from EDHS (2008)

Appendix 3: Share of Women Who Strongly Agree/ Agree That A Woman Who Is Full Time Job Is Not A Good Mother and Those Who Strongly Agree/ Agree That A Woman Should Be Financially Autonomous (%)

Governorate	Share of women who strongly agree/ agree that a woman who is full time job is not a good mother	Share of women who strongly agree/ agree that a woman should be financially autonomous
Cairo	5	24
Alex.	7	26
Port-Said	2	23
Suez	4	17
Damietta	1	14
Dakahlia	3	18
Sharkia	4	18
Kalyoubia	2	19
Kafr-Elsheikh	7	29
Gharbia	7	22
Menoufia	15	19
Behera	3	22
Ismailia	3	19
Giza	5	17
Beni-Suef	3	11
Fayoum	4	15
Menia	3	15
Asyout	7	25
Suhag	10	17
Qena	6	15
Aswan	7	19
Luxor	10	26

Appendix 4: Average Number of Children by Age Cohort

	Age	Average number of children
Age cohort 1	14-25	1.17
Age cohort 2	26-35	2.36
Age cohort 3	36-45	3.56
Age cohort 4	46-60	1.17