Determinants of Time Spent by Egyptian Females (15-64 years) on Domestic Work
Mahmoud, D.[1] ,   Gadallah M.[2]

Abstract:

Domestic and care work is an important type of unpaid work that contributes significantly to human welfare and wellbeing. However, it has been excluded from the view of the national accounts and consequently from the policy makers' considerations. In many cultures, domestic tasks are considered the main role of women, even if they do paid work outside home. Since this type of work isn't considered, the real contribution of women to economy and welfare is consequently underestimated. Using *the Egyptian labor force sample survey of 2006,* the determinants of time spent in domestic and care work are investigated for both, currently married and single females.

While Tobit model is more common in time used data, this paper compares also the Tobit model with Regression model (OLS) and Fractional Logit Model. Results showed that if the number of zeros increases, the Tobit performance will be better than the Fractional Logit model and the OLS. Also, it showed that the most important determinants of time of domestic and care work are; number of children less than 18 years, presence of husband, presence of adult females in the household, the indexes of women empowerment (mobility, decision making, access to resources, acceptance of domestic violence/fear of violence and cultural norms), place of residence and the standard of living.

Keywords: Domestic and care work, time use, Tobit model, Fractional Logit model

<div dir="rtl">

محددات الفترة الزمنية التي تقضيها السيدات المصريات (15 – 64) سنة للقيام بالأعمال المنزلية

ملخص

تُعدّ الأعمال المنزلية ورعاية الأسرة نوع هام من الأشغال غير مدفوعة الأجر التي تُسهم بصورة واضحة في تحقيق رفاه الإنسان وهناءه، ولكنّه تم استبعاده من الحسابات الوطنية وبالتالي من اعتبارات صانعي السياسات. تُعدّ الأعمال المنزلية في ثقافات عدّة الدور الرئيسي للسيدة، حتى وإن قمن بأشغال مدفوعة الأجر خارج المنزل. وحيث أن الأعمال المنزلية هو نوع مُغفل من الأشغال التي تقوم بها السيدة فإن المساهمة الحقيقية للمرأة في الاقتصاد وتحقيق الرفاه تعاني من سوء تقدير وتقييم.

باستخدام عينة مسح العمالة المصري للعام 2006 تم تحديد محددات الوقت الذي تقضيه السيدات المتزوجات والعازبات في الأعمال المنزلية ورعاية الأسرة. وعلى الرغم من أن نموذج Tobit هو الشائع عند التعامل مع البيانات المعتمدة على الوقت إلا أن هذه الورقة تقارن بين نموذج Tobit ونموذج الانحدار (OLS) ونموذج Fractional Logit Model.

أظهرت النتائج أنه بزيادة عدد الأصفار (الوقت يساوي صفر) فإن أداء نموذج Tobit هو الأفضل بين الثلاثة نماذج، كما أظهرت النتائج أن المحددات الهامة هي: عدد الأطفال الذين يقل عمرهم عن 18 سنة، وجود زوج في الأسرة، وجود سيدات بالغات أخريات في الأسرة بالإضافة إلى مؤشرات تمكين المرأة (سهولة الحركة والتنقل، اتخاذ القرار، الوصول للموارد، تقبل العنف/ الخوف من العنف والمعايير الثقافية)، وكذلك محل الإقامة ومستوى المعيشة.

الكلمات الرئيسية: الأعمال المنزلية ورعاية الأسرة، استغلال الوقت، نموذج Tobit، نموذج Fractional Logit Model

</div>

[1] Statistical Researcher at the National Council for Childhood and Motherhood, the ministry of health and population, and master student at Faculty of Economics and Political Science, Statistics Department, Cairo University, Egypt; email: doaa_am@yahoo.com.

[2] Assistant Professor at Faculty of Economics and Political Science, Statistics Department, Cairo University, Egypt; email: mayabaza@hotmail.com

Introduction

Unpaid work include all productive activities outside the official labor market that done by individuals for their own households or for others. This includes activities such as housework, caring work, subsistence agriculture, helping in family businesses and transport services. All of these activities have one common feature — they could be replaced by market goods and paid services (Swiebel, 1999). Despite the importance of unpaid work, it is largely not acknowledged in the labor force and national accounts (Gibb, 1999).

A broad definition of unpaid work distinguishes between two work categories; Unpaid Work covered in the System of National Accounts (SNA) and Unpaid Work outside SNA. Unpaid Work outside SNA includes; domestic activities (such as laundry and cooking), care activities (such as caring for children) and volunteer services (ESCAP and UNDP, 2003). In several cultures it is believed that women' primary functions are reproductive, **domestic and care work "DOCA"**, while men are the main breadwinners. Women's **(DOCA)** is always being devalued and ignored in economic indicators such as GDP. This underestimates women's role in the work field (Lee and UNDP 2005).

Mahmoud and Gadallah (2011) showed that about 92% of Egyptian women (15-64) are engaged in DOCA, either exclusively or combined with other work (unpaid work within SNA or paid work). A group of women (about 14%) are engaged in both paid and unpaid work. Hence, they spend large amounts of hours working (about 70 hours per week). This group of women is doubled burdened, and this may affect their chances of better life, their health and even their well-being.

Gadallah (2011) found that the double burden of domestic and paid work is one of the obstacles that hinder women's participation in the labor force. Also, if women decide to enter the labor market, they quit once they get married.

Since Egyptian women devote more time to DOCA affecting their chances of life; accordingly, we need to investigate the determinants of time spent in DOCA by Egyptian women.

In this paper two main objectives are studied:
1- The main determinants that affect the time spent in DOCA work by Egyptian women aged 15-64, i.e. the labor force age category.
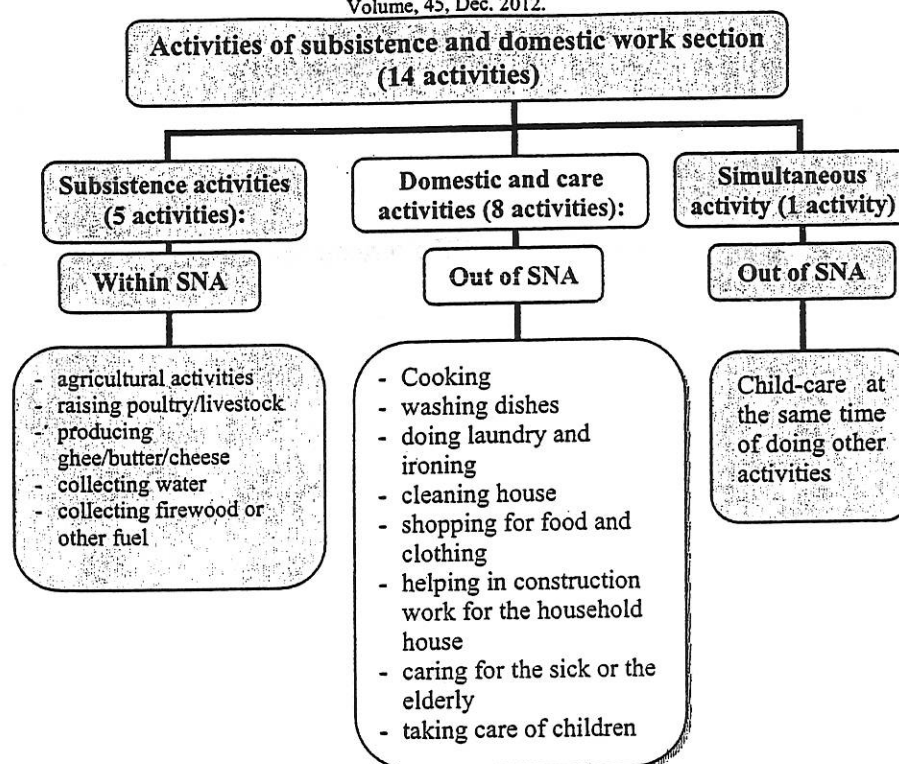2- Comparing different approaches in identifying the determinants.

1 The Data

The data used is from the nationally representative Egypt Labor Market Panel Survey 2006 (ELMPS). It covers the civilian non-institutionalized population 6 years of age and above, conducted on a sample of 37140 individuals. The residents of the five frontier governorates of North Sinai, Matrouh, Red Sea, New Valley, and South Sinai (2%) are excluded from the survey's coverage. ELMPS 2006 is not a time-use survey but the questions on domestic work in Section 4.3 in the individual questionnaire, investigate time spent on various domestic chores during the past 7 days. The questions in this section are applied to all females (6 years and older) and males aged 6-17 (Barsoum, 2007).

Section 4.3 of the ELMPS contains 14 activities which are done for the purpose of the household own consumption. These activities can be grouped as follows:

Figure 1: The activities of subsistence and domestic work section in ELMPS 2006

Activities of subsistence and domestic work section (14 activities)

Subsistence activities (5 activities):	Domestic and care activities (8 activities):	Simultaneous activity (1 activity)
Within SNA	**Out of SNA**	**Out of SNA**
- agricultural activities - raising poultry/livestock - producing ghee/butter/cheese - collecting water - collecting firewood or other fuel	- Cooking - washing dishes - doing laundry and ironing - cleaning house - shopping for food and clothing - helping in construction work for the household house - caring for the sick or the elderly - taking care of children	Child-care at the same time of doing other activities

Source: Mahmoud and Gadallah 2011

The target group in this paper is all females aged 15-64 to be comparable with the labor force age category, time of eight activities of DOCA is considered.

2 Theoretical Framework

Some studies (such as: Sultana et al, 1994, Gauthier et al, 2006 and UN, 2005) classified the main variables affecting the unpaid work time into two main groups:

- Individual variables: sex, age, marital status, paid work (or employment status), educational level and being still studying or not
- Household variables: place of residence, number of children less than 18 years, age of the youngest child in the household, number of adult females in household, household income (or level of standard of living) and husband's presence in household.

Some other studies (such as: Kizilirmak and Memis, 2009, Floro and Miles, 2003) showed that time-use patterns in addition to previous variables are related to social factors such as: gender inequalities and prevailing social norms. Accordingly, this paper tries to test the effect of women empowerment factor.

Many studies suggest different frameworks of women empowerment measurement. Malhotra et al. (2002) suggest that women's empowerment occurs along these dimensions: economic dimension, socio-cultural dimension, familial/interpersonal dimension, legal/ Knowledge of legal rights dimension, political dimension and psychological/ Self-esteem dimension.

Based on time-use literatures and considering the factors related to time-use pattern in used data; this paper considers the following variables:

- *Woman's age*, no significant results are obtained for the age coefficients in female's home time allocation.

- *Educational level,* it has an indeterminate effect on the allocation of a woman's time in market and at home (Sultana et al. 1994). There is a robust negative-to-insignificant relationship appears between the amount of time spent on non-market work and the level of education in many studies (Poza 1999).
- When females are *still studying* they devote less time to home duties.
- *Women participation in the market,* employed women compared to unemployed ones spend significantly less amount of time on unpaid work.
- *Marriage* increases women's unpaid work time particularly by increasing their time spent on caring activities
- *Presence of husband in household* reduces work load on their wives because they usually share work with them.
- *Presence of children* has a positive effect; an additional child (less than 18 years) increases the work load. *The older the children,* the less time consuming they are.
- *Living in a rural area* has a positive effect on the amount of time spent on housework. In rural areas there are some household activities which are highly time-consuming like farming, collecting water and fuel.
- An increase in *the number of adult females in the household* reduces the housework burden.
- *Poverty* increases women's time spent on unpaid work by increasing their time spent on water and fuel collection as well as on home maintenance. Kizilirmak and Memis, 2009 showed that being poor increased the amount of time women spent on unpaid work.
- *The empowerment indexes:*
  - Decision-making index (an indicator of bargaining power in the household): there is evidence suggesting that the bargaining power of the members affect the household work time distribution. (Kizilirmak and Memis, 2009).
  - Access to resources index: access to financial resources and contributing to household income are important factors that determine how unpaid work time is distributed among different tasks (Kizilirmak and Memis, 2009).
  - Mobility index: as women's ability of movement increases, women can participate in many unpaid activities such as: collecting water and firewood, child-care activities and shopping for home (Sicat, 2007).
  - Cultural norms index (an indicator of woman's view for herself): some cultures keep stronger social and kinship ties than others, creating a tendency for work sharing in a household (Floro and Miles, 2003).
  - Violence against women: many reports showed that women permanent feeling of fear or vulnerability to violence can negatively affect their physical and mental health and their ability to participate in family life and public life (Desai, 2010, HREOC, 2008, UNDP, 2006).

3 Methodology

Distributions of time data contain many zeros arising for two reasons. First, an individual does not always engage in the given activity (structural or real zeros). Second, zeros arise because an individual does not engage in the activity during the survey period but he is used to do this activity in general (sampling zeros). For example, the individual may be sick in the week of the survey (Brown and Dunn, 2011, Kizilirmak and Memis, 2009). In microeconomic analyses, this type of data is called censored data; analyzing a dependent variable which is reported as a single value (zero in the case of time use data) for a significant fraction of the observations. With censored data, used distribution is a mixture of discrete and continuous distributions (Greene, 2002).

A variety of statistical techniques are used to analyze time use data, three models are considered: Tobit models, linear models using Ordinary Least Squares (OLS), and fractional logit model.

Using (regression models based on OLS) in time use analyses has some arguments. Some such as (Floro and Miles 2003) see that OLS ignores the censoring problem. Greene 1997 mentioned that OLS estimation leads to biased and inconsistent estimates when there is a significant censoring in data (i.e., large numbers of zeros) typically found in time-diary data. Also, Greene 2002 stated that "conventional regression methods fail to account for the qualitative difference between limit (zero) observations and non-limit (continuous) observations". All of those researchers prefer using the Tobit models to address the censoring problem. The opposing side (such as Bittman, 2003) argues that when the time length is longer than the time-dairy or with tiny proportion of zero observations, OLS estimation can be used.

Tobit models treat all records of zero time (real or sampling zeros) as non-participation in the activity and result that some individuals who regularly engage in an activity but do not do it during the time of the survey may be misidentified as non-participators. These zeros represent measurement error rather than nonparticipation, so that, they suggest to use OLS. Tobit model becomes more difficult in the case of modeling time allocation among a large number of activity categories. This is due to the random error terms being multivariate normally distributed which is particularly a problem when attempting to model time of these multiple categories (Ye and Pendyala, 2005).

The fractional logit model (first proposed by Papke and Wooldridge (1996)) can be adopted in time use analyses in the context of considering the share nature of time use dependent variable. It presents an important advantage over the Tobit specification: it relies on a quasi maximum likelihood estimator, which does not require full normal distributional assumption for consistency (Cardoso et al, 2010).

3. 1 The Tobit Model

The Tobit model assumes that the observed dependent variable y_i for observations i= 1, 2... n satisfies (Maddala, 1983):

$$y_i = \begin{array}{l} L_{1i} \ \ \text{if } y_i <= L_{1i} \\ y_i^*, \ \text{if } L_{1i} < y_i < L_{2i}, \\ L_{2i}, \ \text{if } y_i >= L_{2i} \end{array} \qquad (1)$$

Where the y_i^*'s are latent variable generated by the classical linear regression model:
$y_i^* = \beta'x_i + u_i$, $u \sim$ Normal $(0, \sigma^2)$, x_i is a vector of repressors and β is the corresponding vector of parameters and it estimates the effect of x on y*. Also, L_{1i} and L_{2i} are the lower and upper censored limits. The Tobit model uses MLE to estimate both β and σ for this model (Green, 2002).

Denoting $\Phi(\dfrac{L_{1i} - \beta'x_i}{\sigma})$ and $\Phi(\dfrac{L_{2i} - \beta'x_i}{\sigma})$ by Φ_{1i} and Φ_{2i} respectively, with corresponding densities as ϕ_{1i} and ϕ_{2i} respectively, we get the expectation of y_i as (Maddala, 1983):

▪ The conditional expectation of y_i is given by:

$E(y_i/ L_{1i} < y_i < L_{2i}) = \beta'x_i + E(u_i / L_{1i} - \beta'x_i < u_i < L_{2i} - \beta'x_i)$

$\qquad\qquad = \beta'x_i + \sigma[(\phi_{1i} - \phi_{2i})/(\Phi_{2i} - \Phi_{1i})]$ \qquad (2)

▪ The unconditional expectation is given by:

$E(y_i) = P(y_i = L_{1i}) . L_{1i} + P(L_{1i} < y_i < L_{2i}) . E(y_i/ L_{1i} < y_i < L_{2i}) + P(y_i = L_{2i}) . L_{2i}$

$$= \Phi_{1i} L_{1i} + \beta' x_i (\Phi_{2i} - \Phi_{1i}) + \sigma (\phi_{1i} - \phi_{2i}) + (1 - \Phi_{2i}) L_{2i} \qquad (3)$$

Our dependent variable is right and left censored because we are using a 98-hour window (the maximum hours the normal individual can work in a week)[3].

Interpreting the estimated coefficients from the Tobit model is not simple; we should know that there are four forms of marginal effects that need to be understood (Maddala, 1983):

1. The estimated coefficients themselves β's that represents the changes in **the latent dependent variable (y*):** $\partial E (y_i^*)/ \partial x_i = \beta_i$ (4)

   It shows the effect of a change in a given x_i variable on *the expected value of the latent variable*, holding all other x variables constant.

2. The marginal effect of the **unconditional expected value of the observed dependent variable** y_i: $\partial E (y_i)/ \partial x_i = \beta_i (\Phi_{2i} - \Phi_{1i})$ (5)

   It shows the effect of a change in a given x_i variable on *the expected value of the observed variable*, holding all other x variables constant

3. The marginal effects of **the conditional expected value of the observed dependent variable** y_i: $\partial E (y_i/ L_{1i} < y_i < L_{2i})/ \partial x_i =$

$$\beta_i \left[1 - \left(\left(\left(\frac{L_{1i} - \beta' x_i}{\sigma}\right) \phi_{1i} - \left(\frac{L_{2i} - \beta' x_i}{\sigma}\right) \phi_{2i}\right) / (\Phi_{1i} - \Phi_{2i})\right) - \left((\phi_{1i} - \phi_{2i})/(\Phi_{1i} - \Phi_{2i})\right)^2\right] \quad (6)$$

   It shows the effect of a change in a given x_i variable on *the expected value of the observed variable for only the uncensored observations*, holding all other x variables constant

4. The marginal effects of **the probability of being uncensored:**

$$\partial P (L_{1i} < y_i < L_{2i})/ \partial x_i = \beta_i (\phi_{1i} - \phi_{2i})/\sigma \qquad (7)$$

There is no consensus on which of these marginal effects should be reported, this depends on the purpose of the analysis (Greene, 2002). Wooldridge (2002) recommends reporting both the marginal effects of the conditional and unconditional expected values of y_i. Some researches claim that the conditional mean is the most helpful as it adjusts the mean to reflect the censoring and produces a non-negative result (Brown and Dunn, 2011).

3. 2 The Fractional Logit Model

A traditional solution to fit a model with a proportion dependent variable is to perform a logit transformation on the data.

(Papke and Wooldridge (1996)) (Wooldridge, 2002, p.662) proposed an approach that model E(y/x) as a logistic function G (xβ):

$$E (y/x) = G (x\beta) = \exp (x\beta) / [1+ \exp (x\beta)] \qquad (8)$$

This model ensures that the predicted values for y are in (0, 1), even if the dependent variable takes the values 0 or 1, and that the effect of any x_j on E(y/x) diminishes as $x\beta \to \infty$ that guarantee to get reasonable prediction of the bounded dependent variable.

A method that is robust is quasi-MLE, where Papke and Wooldridge proposed using the Bernoulli log-likelihood function. Maximizing this Bernoulli log-likelihood function yields the quasi-MLE which is consistent and asymptotically normal (Wooldridge, 2002).

---

[3] Both men and women need to spend time in various activities in order to sustain their basic biological functions. It is very difficult to define how much time this should be. On the average, a typical adult is recommended to sleep for eight hours a day and to this should be added time for other self-care activities. As a reference, the average time for personal care and nutrition in Thailand is 2.3 hours a day and in the United States, it is 2.02 hours. Therefore, it is reasonable to assume that, on the average, at least 10 hours per day or 70 hours per week are needed to maintain a person's biological functioning (Medeiros et al., 2007). Taking this into consideration, the maximum time available for work in a week is set to be 98 hours.

When using fractional logit, it is complicated to interpret the coefficients. It is possible to compute the more intuitive "marginal effect" (Gramig, 2008).

The marginal effects in the fractional logit model can be expressed as:

$$\partial E(y/x)/\partial x_j = \beta_j \, g(x\beta) \qquad (9)$$

Where $g(x\beta) = \exp(x\beta)/[1+\exp(x\beta)]^2$, this equation can be interpreted as the change in the conditional expectation of y associated with changes in the explanatory variables (Cameron and Trivedi, 1998), (Wooldridge, 2002)).

Here we calculate the Average Marginal Effects (which are computed for each case, and the computed effects are then averaged) because it's thought that it provides a good representation of how changes in x_j affect the expectation and it's considered an estimate of the mean marginal effect for a population (Cameron, 2009).

3. 3 Comparison methods

Due to the different scale of the dependent variable in three proposed models, the comparison will be:

- Between OLS regression and Tobit model applying the total number of hours spent in domestic work.
- Between Tobit model and Fractional logit model applying domestic work time as a share of the total available time.

The comparison is held for two groups; the currently married females (with little number of zeros) and the single females (with large number of zeros). Currently married females have different domestic time distribution than single females as seen in Figure (2) and Figure (3). While 1.4% of currently married females reported zero values around 17% of single females reported zeros, affecting the distribution.

Figure (2): Distribution of Time of DOCA　　　Figure (3): Distribution of Time of DOCA
　　　　　Currently Married Females　　　　　　　　　　　　Single Females
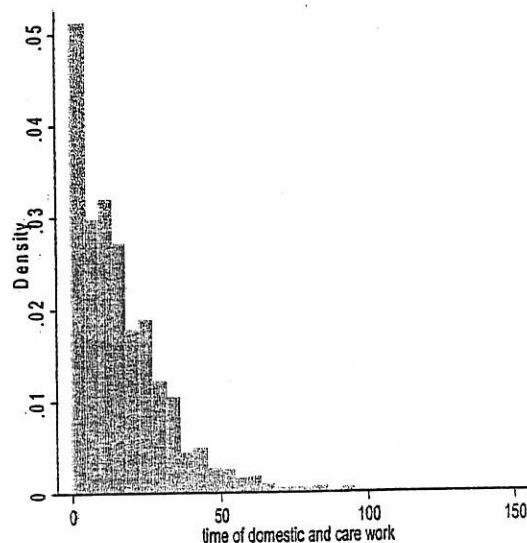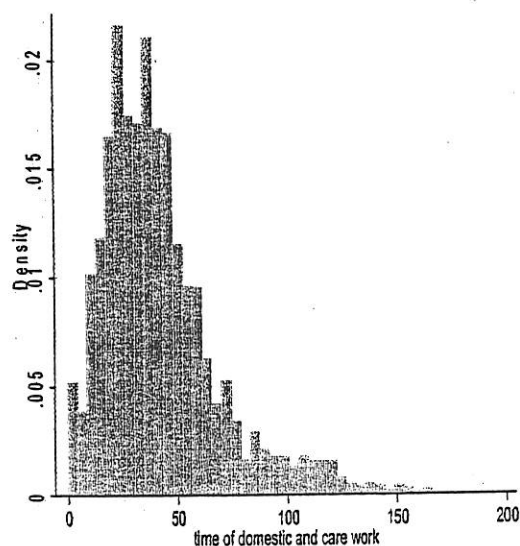
In comparing competing models using the same data, the following is considered:

- The standard errors of the estimates; as a measure of variability or diversity used in statistics. The standard error of estimate in regression analyses shows how much variation of the predicted values from the observed values. The model with the smallest standard error is the best one (Stockburger, 1996). In this context, the standard errors of the average marginal effects are used.

- The correlation between the predicted and observed values of the dependent variable, based on the proposed model, gets higher; the model fits the data well (Stata online help, 2012).

In the linear regression model, the marginal effects/average marginal effects equal the relevant slope coefficient (Cameron, 2009), (Williams, 2011). The most common in Tobit are the marginal effects of unconditional expected value of the observed dependent variable (∂E (y_i)/ ∂x_i) and the marginal effects of conditional expected value of the observed dependent variable ∂E (y_i/ $L_{1i} < y_i < L_{2i}$)/ ∂x_i. For comparison purpose, it is acceptable to use the marginal effect in the unconditional case (it is based on all cases; censored and non-censored). Accordingly, the standard errors of the average marginal effect of the unconditional case are reported for the three proposed models.

4 Results and Discussion

This section concentrates on:

- Comparing the results of the three models; (OLS regression, Tobit and Fractional Logit models).
- Investigating the determinants of time spent on DOCA

4. 1 Comparing the Proposed Models

Comparison is held for two groups; currently married females and single females.

4.1.1 Currently Married Females

While the Tobit model has the lowest standard errors of the estimates, the Regression has the same correlation with the observed variable as Tobit model. However using Regression model in time use data (with zero cases) may result in a negative prediction for the dependent variable, especially if there is a large number of zeros (Brown and Dunn, 2011). As shown in Table (1), differences between Tobit and Regression models are not so large by comparing the standard errors. This can be interpreted as the number of zeros is not large in this case (just 1.4%). However, the Tobit model may be preferable for avoiding out of the range prediction.

In the comparison of Tobit model and the Fractional logit model[4] the differences are neglected, but in most variables the Tobit has smaller standard error. Table (2) shows that fractional logit model has slightly less correlation coefficient than Tobit. Tobit model may perform better than OLS but the differences between the Tobit and Fractional are small. Despite the differences of the standard errors of the three models the significance of the included variables does not change from model to model.

---

[4] The hours were divided over 168 total weeks' hours the Tobit right censoring is at 0.58 representing the 98 hours in first models.

Table (1): Average Marginal Effects (AME) and Standard Errors of AME in Regression and Tobit models [5] for Currently Married Females

Variables	OLS			Tobit		
	AME	S.E.	P-value	AME	S.E.	P-value
Alexandria, Suez, Port-said	12.44	2.558123	0.000	11.71	2.153462	0.000
Urban-lower	-4.08	1.674730	0.015	-3.00	1.367397	0.029
Urban-upper	-1.56	2.157276	0.471	-0.41	1.917601	0.832
Rural-lower	-3.76	1.654358	0.023	-2.74	1.364691	0.045
Rural-upper	-7.31	1.609822	0.000	-5.73	1.360365	0.000
Age	0.17	0.205651	0.423	0.21	0.182652	0.234
Age-squared	-0.01	0.002445	0.027	-0.01	0.002208	0.007
read and write	-0.43	1.335724	0.747	-0.45	1.246530	0.715
primary & Preparatory	1.45	1.211325	0.231	1.56	1.137253	0.170
general & Technical secondary	2.98	1.347269	0.028	2.60	1.247842	0.038
above intermediate & University & above	1.49	1.521463	0.328	0.83	1.360531	0.542
Poor	-0.42	1.186473	0.721	-0.59	1.056842	0.574
Middle	1.50	1.292584	0.247	1.30	1.156950	0.260
Rich	1.68	1.492699	0.262	1.68	1.314727	0.201
Very Rich	-1.04	2.792371	0.708	-0.31	2.617753	0.904
Decision making index	2.42	1.125169	0.032	2.40	1.045706	0.022
Movement ability index	5.09	1.533770	0.001	4.21	1.348073	0.002
Access to resources index	0.94	0.258855	0.000	0.79	0.229830	0.001
Acceptance of husband violence index	3.28	1.014732	0.001	2.68	0.902106	0.003
Female doesn't afraid of males in the household	1.52	0.719401	0.035	1.31	0.634477	0.040
Respect factor (cultural norms about women)	1.58	0.644133	0.015	1.41	0.552236	0.011
Number of other females in the household	-1.20	0.291186	0.000	-1.18	0.259953	0.000
Not a waged worker	4.39	1.299391	0.001	3.63	1.173133	0.002
Doesn't work	4.14	1.108842	0.000	3.12	0.973551	0.001
Doesn't have children	-21.63	0.933484	0.000	-19.37	0.817217	0.000
Youngest child in the household in the class age (6-17)	-11.68	0.911782	0.000	-10.39	0.799409	0.000
Youngest child in the household in the class age (18+)	-18.42	1.328337	0.000	-16.75	1.238335	0.000
Husband present in the household	4.31	1.319819	0.001	3.64	1.203741	0.003
Correlation Coefficients of Observed and Predicted Values [6]	0.46			0.46		

[5] (the variables' definitions in Appendix)

[6] The predicted variable in Tobit model is the predicted unconditional mean of the observed dependent variable (E(y/x)), because it is the most informative as it adjusts the mean to reflect the censoring and produces a non-negative result (Brown and Dunn, 2011)

Table (2): Average Marginal Effects (AME) and Standard Errors of AME in Tobit and Fractional Logit models for Currently Married Females

Variables	Tobit (using fractions)			Fractional Logit		
	AME	S.E.	P-value	AME	S.E.	P-value
Alexandria, Suez, Port-said	0.06968	0.012818	0.000	0.06160	0.010879	0.000
Urban-lower	-0.01784	0.008139	0.029	-0.01745	0.007868	0.027
Urban-upper	-0.00243	0.011414	0.832	-0.00143	0.010976	0.897
Rural-lower	-0.01632	0.008123	0.045	-0.01568	0.007795	0.045
Rural-upper	-0.03412	0.008097	0.000	-0.03330	0.007921	0.000
Age	0.00129	0.001087	0.234	0.00198	0.001112	0.076
Age-squared	-0.00004	0.000013	0.007	-0.00005	0.000014	0.001
read and write	-0.00271	0.007420	0.715	-0.00567	0.008186	0.489
primary & Preparatory	0.00930	0.006769	0.170	0.00901	0.007343	0.220
general & Technical secondary	0.01547	0.007428	0.038	0.01331	0.007888	0.092
above intermediate & University & above	0.00494	0.008098	0.542	0.00233	0.008410	0.782
Poor	-0.00354	0.006291	0.574	-0.00371	0.007007	0.597
Middle	0.00776	0.006887	0.260	0.00857	0.007542	0.256
Rich	0.01002	0.007826	0.201	0.01120	0.008320	0.179
Very Rich	-0.00187	0.015581	0.904	0.00035	0.016056	0.982
Decision making index	0.01427	0.006224	0.022	0.01325	0.006663	0.047
Movement ability index	0.02503	0.008024	0.002	0.02610	0.007983	0.001
Access to resources index	0.00469	0.001368	0.001	0.00472	0.001406	0.001
Acceptance of husband violence index	0.01595	0.005370	0.003	0.01621	0.005577	0.004
Female doesn't afraid of males in the household	0.00777	0.003777	0.040	0.00743	0.003640	0.041
Respect factor (cultural norms about women)	0.00837	0.003287	0.011	0.00854	0.003282	0.010
Number of other females in the household	-0.00704	0.001547	0.000	-0.00709	0.001644	0.000
Not a waged worker	0.02159	0.006983	0.000	0.02043	0.007179	0.005
Doesn't work	0.01857	0.005795	0.002	0.01655	0.005782	0.004
Doesn't have children	-0.11529	0.004864	0.001	-0.11994	0.005508	0.000
Youngest child in the household in the class age (6-17)	-0.06182	0.004758	0.000	-0.05917	0.004934	0.000
Youngest child in the household in the class age (18+)	-0.09968	0.007371	0.000	-0.10253	0.008794	0.000
Husband present in the household	0.02169	0.007165	0.003	0.02129	0.007344	0.004
Correlation Coefficients of Observed and Predicted Values	0.475			0.474		

4.1.2 Single Females

Independent variables in this section do not include the variables related to married women: presence of husband, acceptance of male violence and the age of the youngest child. It includes one new variable; being currently at school.

In case of single females the number of zeros increases to about 17%. Hence, the differences between OLS and Tobit are bigger. The performance of Tobit is preferred over the ordinary regression after comparing the standard errors and the correlation coefficient (Table (3)).

On the other hand the increasing number of zeros creates the risk of out of the range predicted values in case of using the OLS[7].

---

[7] There are two observations with negative predicted values using the OLS.

Table (3): Average Marginal Effects (AME) and Standard Errors of AME in Tobit and Fractional Logit models For Single Females

Variables	OLS			Tobit		
	AME	S.E.	P-value	AME	S.E.	P-value
Alexandria, Suez, Port-said	4.00	1.494673	0.008	3.14	1.226908	0.011
Urban-lower	-2.19	1.064645	0.041	-2.50	1.032023	0.016
Urban-upper	2.35	1.536445	0.126	2.15	1.353769	0.112
Rural-lower	-1.12	1.124338	0.319	-1.47	0.992097	0.139
Rural-upper	-0.84	1.274073	0.511	-0.44	1.161785	0.701
Age	0.83	0.366810	0.025	0.79	0.309031	0.011
Age-squared	-0.01	0.006047	0.072	-0.01	0.005064	0.030
read and write	-1.92	3.057188	0.530	-1.31	2.458329	0.594
primary & Preparatory	-0.20	3.463722	0.953	-0.23	2.776026	0.933
general & Technical secondary	-1.35	3.305679	0.684	-1.16	2.628540	0.658
above intermediate & University & above	-2.47	3.385149	0.465	-1.77	2.707298	0.514
Poor	2.91	1.314830	0.027	2.26	1.153043	0.052
middle	2.74	1.285308	0.034	2.02	1.165661	0.084
Rich	0.11	1.422596	0.937	-0.08	1.312156	0.951
Very Rich	-4.13	2.223555	0.064	-5.07	2.368411	0.033
Decision making index	2.22	1.433381	0.123	1.66	1.249113	0.185
Movement ability index	3.83	1.348884	0.005	3.86	1.194026	0.001
Access to resources index	0.56	0.204537	0.006	0.58	0.181596	0.002
Female doesn't afraid of males in the household	-1.78	0.749506	0.018	-1.58	0.669457	0.020
Respect factor (cultural norms about female)	-0.83	0.586273	0.160	-0.61	0.544885	0.267
Number of other females in the household	-1.41	0.244670	0.000	-1.22	0.227660	0.000
Not a waged worker	13.12	2.531357	0.000	10.93	1.999584	0.000
Doesn't work	11.46	1.019910	0.000	9.96	0.869153	0.000
Studying at present	-11.97	0.948977	0.000	-11.74	0.811876	0.000
Correlation Coefficients of Observed and Predicted Values	0.446			0.447		

When comparing between the Tobit and the Fractional Logit the differences increase with smaller standard errors for the Tobit model.

As the number of zeros increase, the performance of Tobit model becomes better comparing with regression or fractional logit models.

Table (4): Average Marginal Effects (AME) and Standard Errors of AME in Tobit and Fractional Logit models For Single Females

Variables	Tobit (using fractions)			Fractional Logit		
	AME	S.E.	P-value	AME	S.E.	P-value
Alexandria, Suez, Port-said	0.01872	0.007303	0.011	0.02084	0.007911	0.009
Urban-lower	-0.01489	0.006143	0.016	-0.01360	0.006790	0.045
Urban-upper	0.01281	0.008058	0.112	0.01367	0.008629	0.113
Rural-lower	-0.00877	0.005905	0.139	-0.00780	0.006874	0.258
Rural-upper	-0.00266	0.006915	0.701	-0.00350	0.007454	0.639
Age	0.00473	0.001839	0.011	0.00422	0.001589	0.009
Age-squared	-0.00007	0.000030	0.030	-0.00006	0.000026	0.022
read and write	-0.00781	0.014633	0.594	-0.00792	0.012677	0.533
primary & Preparatory	-0.00139	0.016524	0.933	-0.00150	0.014318	0.917
general & Technical secondary	-0.00693	0.015646	0.658	-0.00600	0.013709	0.662
above intermediate & University & above	-0.01053	0.016115	0.514	-0.01030	0.014057	0.465
Poor	0.01345	0.006863	0.052	0.01551	0.007179	0.031
middle	0.01204	0.006938	0.084	0.01464	0.007245	0.044
Rich	-0.00048	0.007810	0.951	-0.00049	0.008373	0.953
Very Rich	-0.03018	0.014098	0.033	-0.03456	0.017892	0.055
Decision making index	0.00987	0.007435	0.185	0.01264	0.007856	0.109
Movement ability index	0.02300	0.007107	0.001	0.02236	0.007624	0.003
Access to resources index	0.00347	0.001081	0.002	0.00291	0.001156	0.012
Female doesn't afraid of males in the household	-0.00938	0.003985	0.020	-0.01099	0.004439	0.014
Respect factor (cultural norms about female)	-0.00361	0.003243	0.267	-0.00449	0.003271	0.169
Number of other females in the household	-0.00724	0.001355	0.000	-0.00821	0.001565	0.000
Not a waged worker	0.06505	0.011902	0.000	0.06621	0.011074	0.000
Doesn't work	0.05931	0.005174	0.000	0.06023	0.006006	0.000
Studying at present	-0.06985	0.004833	0.000	-0.07571	0.005449	0.000
Correlation Coefficients of Observed and Predicted Values	0.452			0.455		

4. 2 Investigating the Determinants

Section 4.1 showed that Tobit model performs better than regression model of fractional logit model, accordingly, this section examines the determinants of time of DOCA using Tobit model for currently married and single females.

4.2.1 Currently Married Females

The results (columns of Tobit model in Table (1)) show that most variables are significant. This can be illustrated as follows:
- Females in (Alexandria, Suez, and Port-said) spend more time in domestic and care work, compared to those in Great Cairo regions (about 12 hours more). Females in lower-Egypt (urban or rural) and rural-upper spend less time compared to females of Great Cairo (3, 3 and 6 hours less, respectively). Urban-upper region do not differ significantly from Great-Cairo region in time spent in domestic and care work for females.
- Age of the married female does not have a significant impact on the time spent in domestic and care work in this study. This result is consistent with previous studies (Kizilimark and Memis, 2009).
- The intermediate educated females spend the longest hours doing domestic work compared to lower and higher educated female.
- Standards of living have no impact on females' domestic and care work time. Based on this study, we cannot determine the effect of standard of living (in terms of wealth index) on females' domestic and care work time. This indicates that owning electrical appliances does

not necessary reduce time spent in domestic work. Furthermore, there is an indication that middle and rich classes spend more time doing domestic work than the very poor or very rich females, despite the fact that differences are not significant.

- There is a positive significant impact of the decision making index on domestic working hours. This leads to the conclusion that some variables –that construct the index- are related to the domestic and care work activities such as: shopping and taking children to doctor or to school (child care). When the value of the decision of these activities increases, the value of the index increases consequently.

- Also, access to resources index has a positive significant sign: which means that access to resources does not increase the bargaining power for Egyptian currently married female and consequently does not decrease the work-load. The marginal effects show that as the index value increases, the domestic and care work time increases 0.8 hours (about 48 minutes) per week.

- There is a positive significance relationship between female's opinion about cultural norms index and time of domestic and care work. This means that with more liberal female's view of themselves (i.e. female should be treated more fairly and respectively); they spend more time in domestic and care work. This may refer to a gap between what actually females do in reality and what they hope for themselves.

- Increasing the mobility index increases the time of domestic and care work by 4.2 hours per week. This result confirms the previous consensus.

- A female that does not fear a male spends 1.3 more hours working than a scared female. Also, females that reject violence more spend more time in domestic work. This indicates that females who face domestic violence are less likely to devote more time to their households.

- An increase in the number of adult females in the household reduces the housework burden (Gauthier et al. 2006). The negative sign of this variable supports this opinion. The average marginal effect of this variable indicates that when there is another female in the household, females spend about 1.2 hour less working in one week. This can be logically accepted, if there are more adult females, the housework duties will be distributed among them which in tern reduces the time females spend in this type of work.

- Non-waged-worker female and non-worker female spend about 4 and 3 hours more doing domestic chores compared to waged-worker female. This result is expected because when woman works in the labor market, she has to spend more time out of house. While being at home, the burden of domestic activity falls more heavily on her. On the other hand, the results refer to the fact that whether or not females participate in the market, they have to allocate some of their time to housework since the traditional norms on roles of men and female consider women homemakers and men breadwinners (Sultana et al. 1994). In conclusion being a waged worker reduces the married woman domestic work by only around half an hour a day, i.e. it does not hold her back from her home duties.

- The presence of young children increases the time spent in domestic and care work dramatically. As child gets older, a female's domestic work time decreases from 10 to 17 hours per week, compared to women having children less than 6 years old. This result confirms what previous researches referred to that pre-school aged children (2-5 years) place a higher demand on females' primary time than older children The older the children, the less time intensive they are (Anxo, 2001). Logically, a female who does not have children spends less time (19 hours) doing domestic work compared to those who have children less than 6 years.

- When a husband is present in the household, a female's burden increases by about 4 hours. This reflects Egyptian culture that the husband not only does not help at home, but actually increases the load.

4.2.2 Single Females

Using the results in Table (3), columns of Tobit model:

- Still females of Alexandria, Suez and Port-said work spend more than those live in Great Cairo, but with lower difference (3 hour). Females of urban lower areas spend less time than the females of Great Cairo by 2.5 hours. These results reflect the fact that regional culture has a great impact on time use of married and single females in Egypt.
- Among single females educational level does not have an impact on the domestic working hours.
- The movement ability and having other females in household have almost same significant impact as among married females.
- A waged working single female spends about 10 hours less than a non working female and 11 hours less than a non waged worker during the week. This reflects the fact that waged jobs drop the time spent doing domestic chores but mainly for single females. Once a female gets married the number of hours reduced is much smaller.
- As single females get older they spend more time in domestic and care work, but after certain age they reduce their home work.
- The impact of the wealth index is clearer in the case of single females. Poor or middle standard females spend 2 hours more per week more in domestic and care work compared to very poor female. Interestingly, there is no difference between very rich and very poor females in their time devoted to domestic and care work, indicating that the middle class female has the bigger burden.
- While fear doesn't push a married woman to work more at home, it pushes a single female to spend more time doing chores at home.
- A student female spends 12 hours per week less than a female who does not study at present. More than third of single female are studying (39%).

Conclusion

- Based on the data used in this study, dealing with time use data with considering the censoring concept (Tobit model) is better than dealing with it ignoring the censoring (regression model), especially when number of zero cases increases. Also, when dealing with time use data as a share of finite resource "sharing concept", Tobit model slightly performs better than Fractional Logit model regardless of number of zero cases.
- For currently married females, the more responsibilities in the household they have, the more time they spend in domestic and care work, as expected. Domestic work increases if females have more children less than 18 years especially if they are young. Child-care work takes large number of hours for currently married female (19 hours of domestic work less for female with no children)
- A single female committed to studying reduces her home duties by about 12 hours a week.
- Married waged worker females are heavily burdened and dedicated to their housework despite their less available time.
- The empowerment factors play a significant role in a married woman's time allocation. An empowered woman, through resource access, mobility freedom, decision making is more committed to her home which in turn leads her to spend more time doing domestic work.
- Fear does not push a married woman to care more for her home, and it shouldn't. As for single females it pushes them to put more hours doing chores, but only by 2 hours a week. More awareness programs should be paid to decrease domestic violence and they should also target males and not only females.
- Finally, despite the culture norms that a working empowered woman is less likely to care for her family, these results deny this norm and reveal the fact that she is still dedicated to her home chores.

References:

Anxo. D. 2001. Time Allocation And The Gender Division Of Labor In France And Sweden1- edited by the Ministry of Employment and Solidarity, DARES.

Barsoum, G. 2007. Egypt Labor Market Panel Survey 2006: Report on Methodology and Data Collection. Economic Research Forum (ERF), Working Paper 0704. ERF, Cairo, Egypt.

Bittman, M., Mahmoud, J. R and Wajcman, J. 2003. Appliances and their impact: the ownership of domestic technology and time spent on household work. SPRC (Social Policy Research Center), discussion Paper No. 129. University of New South Wales, Sydney NSW 2052, Australia

Brown. J. E. and Dunn. P. K. 2011. Sociological Methods & Research. Comparisons of Tobit, Linear, and Poisson-Gamma Regression Models: An Application of Time Use Data. Sociological Methods & Research. DOI: 10.1177/0049124111415370. SAGE.

Cameron. A. C. and Trivedi. P. K. 1998. Regression analysis of count data, Cambridge University Press, United Kingdom

Cameron. A. C. 2009. Microeconomics Using Stata, first edition

Cardoso. A. R., Fontainha. E. and Monfardini. C. 2010. Children's and parents' time use: empirical evidence on investment in human capital in France, Germany and Italy. Springer Science and Business Media, LLC

Desai. M. 2010. Human Development Research Paper, Hope in Hard Times: Women's Empowerment and Human Development. United Nations Development Program Human Development Reports, Research Paper

Economic and Social Commission for Asia and the Pacific (ESCAP) and the United Nations Development Program (UNDP). 2003. Integrating unpaid work into national policies. New York, United Nations.

Economic Research Forum. 2006. Egypt Labor Market Panel Survey of 2006 (ELMPS). A publicly accessible database of the Economic Research Forum, Cairo, Egypt. (http://www.erf.org.eg).

El-Hamidi. F. 2003. Poverty and labor supply of females: Evidence from Egypt. Paper presented at the Tenth Annual Conference of the Economic Research Forum (ERF), Morocco, 16-18 December 2003

Floro. M. S. and Miles. M. 2003. Time Use and the Significance of Overlapping Activities. Based on the article, "Time Use and Overlapping Activities: Evidence from Australia" - Cambridge Journal of Economics, Vol 27, No. 6, pp. 881-904

Gadalla, M. 2011. Factors of Career Mobility in Egypt by Gender. Economic and Research Forum (ERF), Cairo, Egypt. Working paper, No 623.

Gauthier, A. H., Gershuny, J. and Fisher, K. Feburary 2006. Multinational time use study, user's guide and documentation, Version2. The Centre for Time Use Research- University of Oxford- United Kingdom

Gibb, H. 1999. Linkages between paid and unpaid work in human resource policy: Putting a value on unpaid work. Working paper for the APEC Human Resources Development Working Group Project, Linkages between Paid and Unpaid Work in Formulating Human Resource Policy. Asia Pacific Economic Cooperation Forum, Hong Kong, China.

Gramig. B. M. 2008. Essays on the Economics of Livestock Disease Management: On-Farm Biosecurity Adoption, Asymmetric Information in Policy Design, And Decentralized Bio-economic Dynamics. Michigan State University - Department of Agricultural Economics. Submitted to Michigan State University in partial fulfillment of the requirements for the degree of Doctor of Philosophy

Greene. W. H. July 2002. Fifth Edition-Econometric Analysis. Greene-50240 gree50240 FM, New York University, prentice hall - Upper Saddle River, New Jersey

HREOC (Human Rights and Equal Opportunity Commission). 2008, Gender equality: What matters to Australian women and men, The Listening Tour Community Report. HREOC, Sex and Age Discrimination Unit, ISBN 978-1-921449-04-8, Sydney, Australia

Kizilirmak. B. and Memis. E. August 2009. The Unequal Burden of Poverty on Time Use. Working Paper No. 572, Levy Economics Institute of Bard College, Annandale-on-Hudson, New York

Lee, L. and UNDP Malaysia 2005. Integrating women's unpaid work into economic indicators

Maddala. G. S. 1983. Limited dependent and qualitative variables in econometrics. Cambridge University Press. New York, USA

Mahmoud and Gadallah. 2011. Imputing Monetary Value to Egyptian Females' Unpaid Domestic and Care Work. Journal of Development and Economic Policies (JODEP). Volume 13 - No. 1. ISSN: 15610411. Arab Planning Institute - Kuwait

Malhotra A., Schuler S., Boender C. et al. 2002. Measuring Women's Empowerment as a Variable in International Development. Gender and Development Group. The World Bank: Washington, DC

Medeiros, M., Osório R.G. and Costa. J. 2007. Gender inequalities in allocating time to paid and unpaid work: Evidence from Bolivia. Working Paper 495, Levy Economics Institute of Bard College, Annandale-on-Hudson, New York

Papke, L. E., and J. M. Wooldridge. 1996. 'Econometric Methods for Fractional Response Variables with an Application to 401(k) Plan Participation Rates. Journal of Applied Econometrics 11, 619–632

Poza. A.S. 1999. How does the level of education affect the allocation of women's time to non-market labor? Discussion Paper No. 62 - Research Institute for Labor Economics and Labor Law - University of St. Gallen - Switzerland

Sicat. M. 2007. Impact of Improved Communication on Women's Transport Needs and Empowerment in Bangladesh, Transport and Communications Bulletin for Asia and the Pacific, No. 76

StataCorp LP. 2009. Stata: Release 11, Statistical Software, Stata base reference manual. College Station, Texas

Stata data analysis examples, online help for Stata
    http://www.ats.ucla.edu/stat/stata/dae/tobit.htm, - accessed on 16-2-2012

Stockburger. D. W. 1996. Introductory Statistics :Concepts, Models, and Applications, WWW Version 1.0, the Psychology Department at Missouri State University, Columbia

Sultana. N., Nazli. H. and Malik. S. J. Winter 1994. Determinants of female time allocation in selected districts of rural Pakistan. The Pakistan Development Review – 33:4 part II – PP. 1141-1153

Swiebel, J. 1999. Unpaid work and policy-making towards a broader perspective of work and employment. DSEA Discussion Paper No.4. Department of Economic and Social Affairs, United Nations, New York

System of National Accounts (SNA). 1993. Prepared under the auspices of the Inter-Secretariat Working Group on National Accounts of the United Nations. Brussels/Luxembourg, New York, Paris, Washington, DC: Commissions of the European Communities-Eurostat, International Monetary Fund, Organization for Economic Co-operation and Development, United Nations, World Bank. http://unstats.un.org/unsd/sna1993/toctop.asp

United Nations, UNDP (United Nations Development Program). 2006. Taking gender equality seriously, making progress, meeting new challenges. Bureau for Development Policy, Gender Unit, New York, USA

Williams. R. 2011. Using Stata's Margins Command to Estimate and Interpret Adjusted Predictions and Marginal Effects. Richard. University of Notre Dame, Indiana, USA

Wooldridge. J. M. 2002. Econometric Analysis of Cross Section and Panel Data. The MIT (Massachusetts Institute of Technology) Press. Cambridge, Massachusetts - London, England

Ye. X. and Pendyala. R. M. 2005. A Model of Daily Time Use Allocation Using the Fractional Logit Methodology. 84th Annual Meeting of the Transportation Research Board (January 9-13). Washington, D.C.

Appendix

The variables definition:

The empowerment indexes can be explained as follows:

- *Decision-making index*: ten variables represent the power of decisions making in the family are included in this index such as: the final say in the family in decisions of; making large household purchases, making household purchases for daily needs, taking child to the doctor and sending children to school.

- *Access to resources index*: four variables included; direct access to household money, having savings or other valuables which can be sold or used, working as a waged worker and finally keeping income for her if she works with wage. The final index have 5 values corresponding to 5 combinations of these questions, the largest value is the best one.

- *Mobility index: the index*: includes 4 questions about the ability of movement to 4 places (local market, local health center or doctor, taking children to the health center or doctor and home of relatives or friends in the neighborhood).

- *Cultural norms index*: using the Factor Analysis, the index is calculated from 10 variables of woman opinions about some objects such as; a woman's place is not only in the household but she should be allowed to work, If the wife has a job outside the house then the husband should help her with the children and in household chores, Women should continue to occupy leadership positions in society, Boys and girls should get the same amount of schooling and Boys and girls should be treated equally. In fact, the cultural norms factor should contain the views of both women and men in the household (husband, father or brother) in these norms. Due to data limitation, the factor used in this study contains only women views in some cultural norms.

- *Violence against women*: two separated variables are used to refer to husband violence against women; a variable of fearing of disagreeing with males in the household and an index represents the currently married women acceptance of violence. We can say that the index is the opinion and the variable of fear is the reality.

Beside the indexes of woman empowerment, the following variables are considered in three models:

The definition of dependent and independent variables

Variable definition	Variable name
	Dependent variable:
It's the total of weekly hours spent in the eight activities of the domestic and care work in this paper. In the Tobit model the dependent variable is right and left censoring (0 and 98). In fractional logit model, this variable is converted to fraction (divided by 168)	Time of domestic and care work (hours per week)
	Independent variables:
	1- the household variables
They are 6 dummy variables Great Cairo, (Alexandria, Suez, Port-said), Urban-lower, Urban-upper, Rural-lower, Rural-upper that = 1 if woman lives in those areas and = 0 otherwise. (Great Cairo is the reference category)	The place of residence
They are 5 dummy variables that = 1 if woman comes from (very poor, poor, middle, rich or very rich) household, and =0 if she doesn't. (very poor is the reference category) The ERF constitutes this index a proxy variable for wealth (asset ownership) of the household based on house assets and appliances. It is constructed using "the factor analysis" (El-Hamidi, 2003).	The wealth index
It's a continuous variable represents the number of the females (6 years and above) in the household. These females could be the woman's daughters or other females exist in the household.	number of other females "more than 6 years old" in the household
They are 4 dummy variables represent the age of youngest child in the household; don't have children, the youngest child is less than 6 years, the youngest child is in the age group (6-17) years and the youngest child is 18 years or more. The youngest child less than 6 years is the reference category.	the age of the youngest child the woman has
	The individual variables
It's a continuous variable of women age; the squared age is included to test the cubic relationship.	Age and age squared
They are 5 dummy variables that = 1 if woman is illiterate, reads and write, primary and preparatory, general secondary/technical secondary, above intermediate/ university or above educated, and =0 if she isn't. (illiterate is the reference category)	The educational levels
They are 3 dummy variables that = 1 if woman is a waged worker, non-waged worker and doesn't work, respectively and =0 if she doesn't. (waged worker is the reference category)	Being a waged-worker
Two dummy variables, one for absence of husband and the second one for husband's presence in household. Husband doesn't exist is the reference category	Husband presence in household
Two dummy variables; study at present, doesn't study at present, and doesn't study is the reference category.	Being studying at present