Intrahousehold Resource Allocation in Egypt: Effect of Distribution of Power within the Household on Child Work and Schooling[*]

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1   Introduction

The allocation of resources within the household has recently become an important research issue. The intrahousehold resource allocation models fall into two broad classes referred to as the "unitary approach" and the "collective approach." Both approaches deduce logical conse-

quences on the distribution of resources within the household from a few postulated premises. Their differences lie, therefore, not in their focus on the distributional aspects of households' internal mechanisms, but in the way the preferences of the members of the household are postulated to interact within these mechanisms.

The unitary model was introduced by Gary Becker around mid 1960s. A key feature of the unitary model is that resource allocation does not depend on the identity of the person receiving the income within the household, since all family members act as if they maximize a single utility function subject to a single budget constraint. In other words, the household can be characterized as one where individuals pool their resources and share the same preferences (Quisumbing and Maluccio 2000).

Afterwards, empirical research started to question the assumptions of the unitary model. This has spawned a number of alternative household "collective" models, which focus on the individuality of the household members and allow for the possibility of them having different preferences. The common implication of all the collective models is that changes in individual-specific control of resources translate into changes in household resource allocation patterns (Chiappori 1992, 1997). Recent research has rejected the unitary model of the household in many developed and developing countries. Considerable country evidence has revealed that family resources are not equally allocated within the households; instead there exists an unequal distribution of resources which usually takes the form of a bias against females or children (see Behrman 1997; Haddad et al. 1997; Quisumbing and Maluccio 2000).

Nevertheless, to the best of our knowledge, the unitary model has not been extensively tested in Egypt. One exception is an analysis-conducted by the first author (Roushdy 2006) using data from the 2003 Interim Egypt Demographic and Health Survey and the 2004 Slowed Fertility Transition Survey project. This analysis provides evidence against the unitary model. The results suggest that women who have access to cash resources are more able to make positive investment in their children's nutrition and education status. The paper concludes by highlighting the need to strength the evidence on the existence and degree of intrahousehold allocation bias in Egypt using richer dataset on the allocation of resources and decision making

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within the household.

Accordingly, the principle aim of this project is to use a new and richer dataset, the 2006 Egypt Labor Market Panel Survey (ELMPS 06), to contribute to the literature on intrahousehold allocation of resources in Egypt. This survey provides detailed information on the household economics, individual's education, working status and time allocation. Additionally, it includes a new module on women empowerment that provides detailed information on women decision making, access to cash resources and mobility. We contributed to the design of this module, with the goal of making it fits the purpose of this project. The objective of this project is to develop a series of paper which aims at understanding better the interplay between households' internal dynamics in the domain of decision-making and its incidence on child welfare, in the social and economic contexts of Egypt. More Specifically, these studies have several specific goals, the most important of which are:

1. To provide a qualitative and quantitative assessment of the link between women's relative power in household decision-making and child development;

2. To provide enough evidence for policy makers on the link between women's empowerment and child welfare, in order to promote informed decision on these matters;

3. To provide a comparison basis of Egypt with countries with similar historical or cultural profile.

This paper is the second in this series of studies. The first paper in this series (see Soiliou and Roushdy 2007) presents a detailed discussion on the historical and cultural landmarks for the analysis of household decision-making power in Egypt, reviews the existing literature, and highlights the methodological problems raised when modeling the linkage between intrahousehold allocation of resources, women's share in the decision-making power, and child development. This second paper focuses on the empirical modeling of the effect of women's bargaining power within the household on child education and child work. The papers following this one in the series will be more concerned with more complex statistical and econometric

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modeling of collective models of the household labor supply.

In this paper, we first briefly outline the theoretical modeling and proxies of bargaining power available in the data, which have been discussed in details in our first paper (see Soiliou and Roushdy 2007). We focus in this analysis on a source of economic power which has recently been examined in the literature, but has not been previously investigated in Egypt, which is the the share of resources that husbands and wives bring to marriage. Several studies have argued that relative asset positions at the time of marriage are an indicator of economic independence within marriage and thus an important indicator of power, since in many societies, assets at marriage are retained to be individual property during marriage and after dissolution of marriage. Hence, as the individual's control over economic resources is an important source of power, then following the same logic relative assets position at marriage should affect the bargaining power during marriage (Thomas, Contreras, and Frankenberg 1999). The objective of this paper is to test whether the women with relatively more assets at marriage are more able to influence the allocation of resources within the household. Under the unitary model, the husband's and wife's assets at marriage should have no effect on child welfare status. Where the unitary model is rejected, we turn to testing a second model that assumes the allocative Pareto-efficiency of all household decisions. Pareto-efficiency of an allocation only requires the impossibility of making one recipient better off without making another recipient worse off. We refer below to this model as "the sharing rule approach" (see Chiappori 1992, 1997, Bourguignon et al. 1993).

The remaining of the paper is organized as follows. Section 2 briefly presents the theoretical modeling underlying the empirical analysis of this series of papers. Section 3 presents the data. Section 3 discusses the empirical findings. The last section is devoted to the concluding remarks and future work.

1.1 A formal Model of Intrahousehold Resources Allocation[1]

This section presents the specification of the basic model underlying the empirical investigation of the link between women empowerment and child welfare in this paper. Our presentation of the model heavily draws on Chiappori (1997) and Thomas, Contreras, and Frankenberg (1999). A maintained assumption of the model is that households are pre-defined entities, and their formation, as well as their structural stability, are both exogenous to the decision behaviors of the household members.[2] Another consequence of the maintained exogeneity assumption is that, unless a dynamic version of the model is considered, family size is exogenously given. As it is now apparent from all these consequences, the above exogeneity assumption limits the area of possible behaviors of household members. In particular, the only behaviors of interest are the ones which do not threaten the very existence and the continuation of the household. It is important to keep this restriction in mind when interpreting the model.

We assume that a household is composed of a husband, a wife, children, and other possible dependents. The extent to which the husband's and the wife's preferences affects the decision process that determines the welfare of the household members, is endogenously determined. This is because their relative decision-making powers (e.g. incomes) depend on their individual and common characteristics that may themselves be determined within the model.

There are G adult members in the household, who are assumed to care for children's welfare. The Household's welfare index is assumed to depend on each of the adult member's specific welfare index, U^j, $j \in \{1,2\ldots,M\}$. These welfare functions are specified as follows

$$U^j \equiv U^j(x^j, X, \theta, \varepsilon), \ j \in \{1,2\ldots,M\}. \tag{1}$$

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[1]For the reader sake, this section is adapted form our first paper in this series, (Soiliou and Roushdy 2007). A more detailed discussion of the background and framework underlying the theoretical model is presented in this first paper.

[2]Note that although this assumption is implicit in most household models, it represents a strong constraint imposed on the model. Indeed, it implies for example that the challenging of well-established social rules within the household by a household member (for instance the wife) will not affect the continuation of the household. But these rules condition to a large extent the formation of the household.

The arguments of the welfare index functions are described as follows: x^j, $j \in \{1, 2 \ldots, M\}$ is a G-dimensional vector describing the consumption levels of each of G goods and leisure time achieved by individual j. The components of the vector X are the household level of consumption of public goods, i.e., goods that are considered as public at the household level. The components of the vector $\theta \equiv (\theta_1, \ldots, \theta_C)$ describes the welfare indexes of the children in the households, and there are C such children in the household. The vectors μ and ε describes respectively observable and unobservable characteristics of the household and its members, which may affect preferences. Note that in this specification, every household member cares for children.[3] Children's welfare is obtained as the outputs of household's production functions, which take the consumption of specific goods (parental care, food, medicines, schooling etc) as inputs:

$$\theta_c = H_c(I^c, X, \mu, \varepsilon), \tag{2}$$

where I^c is the vector of inputs that are necessary to produce the level θ_c of child c's welfare.[4] The general budget constraint to which the household consumption behavior is subject is

$$p\left(\sum_{j=1}^{M} x^j\right) + PX = W + y, \tag{3}$$

where p, P, W and y are respectively the vectors of prices for the private and the public goods, household labor income and non-labor income.[5]

Each household member is assumed to maximize his or her own welfare, under the household constraint and fundamental restriction that any allocative outcome of these individual-specific optimization problems is Pareto-optimal. This means that, given any such outcome, no improvement of an individual's welfare can be obtained without worsening another individual's welfare.

Under the sole efficiency assumption, a standard result is that the household's welfare

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[3]We do not address the question as to whether children care for parents and grandparents within this model.

[4]Note that public goods can also be modeled as outcomes of household production functions.

[5]The products involving price vectors are, of course, inner products.

index can be represented as a weighted average of the individual welfare indexes, where, as indicated above, the weights are endogenously determined. Moreover, a useful intuition of that representation is that the household decision-making process can be thought of as taking place in two successive stages, once the household has decided upon the expenditures on public goods. In stage one, the remaining income is divided among the members according to a "sharing rule" accepted by all. In stage two, each member chooses his or her own optimal levels of consumption under the budget constraint imposed by the income distribution that occurred in stage one (Chiappori 1997).

There is a useful implication of the efficiency restriction, which makes the model suitable for empirical tests. To describe this implication, we assume that the sharing rule depends on factors that are specific to individual members of the household. These "power-related factors" will be referred to as "p-factors."[6] If we assume that the p-factors are exogenous to decision behaviors, the important result on which most empirical studies rely can be stated as follows: the ratio between the sensitivity of the household's demand for a good to one member's p-factors, and the sensitivity of the same demand to another member's p-factors, is constant across goods. It depends only on the individuals involved in the ratio. So, the ratio between the impacts of two members' p-factors on the household's consumption of goods is invariant across the goods. Formally, assume that the focuss is on the household's demand (x_i) for good i, that y_A, y_B respectively denote the p-factors of individuals A and B, and λ denotes the sharing rule, e.g. the weight assigned to individual A's welfare index. Then, the efficiency assumption implies the equality (See Chiappori 1997):

$$\frac{\frac{\partial x_i}{\partial y_A}}{\frac{\partial x_i}{\partial y_B}} = \frac{\frac{\partial \lambda}{\partial y_A}}{\frac{\partial \lambda}{\partial y_B}}. \tag{4}$$

Nevertheless, our data do not include expenditures variables but contain variables describing aspects of child welfare such as the age-specific education level, work status and time allocation. Hence, to operationalize the above model in our context, note that the following

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[6]The "p" stands for "power."

chain of equalities holds for any input z_i of child welfare, i.e., any component of the input vector I^c.

$$\frac{\frac{\partial \theta_c}{\partial y_A}}{\frac{\partial \theta_c}{\partial y_B}} = \frac{\frac{\partial \theta_c}{\partial z_i}\frac{\partial z_i}{\partial y_A}}{\frac{\partial \theta_c}{\partial z_i}\frac{\partial z_i}{\partial y_B}} = \frac{\frac{\partial z_i}{\partial y_A}}{\frac{\partial z_i}{\partial y_B}} = \frac{\frac{\partial \lambda}{\partial y_A}}{\frac{\partial \lambda}{\partial y_B}}, \tag{5}$$

where the last equality is derived in the same ways as relation (4). Equalities (5) have the important implication that they allow to directly focus on child welfare measurement without using expenditures data. This Equality is clearly testable, provided that one is able to identify and quantify the impacts of *exogenous* p-factors. The empirical challenge is, therefore to provide ways of finding such factors.

Previous studies have relied heavily on specific p-factors such as assets owned by women and men at marriage, or non-labor income (Quisumbig 1994, Quisumbing and Maluccio 2000, Thomas, Contreras, and Frankenberg 2002). Quisumbing (2000) reports the importance of the education of the husband and wife, and the assets at marriage of the husband and wife on children's educational outcomes in four (quite different) developing countries: Indonesia, Ethiopia, Bangladesh and South Africa. Not surprisingly, the author reports large disproportions between men's and women's assets brought to marriage in the three of these countries in which the social system is patriarchal. Note that there is a serious econometric problem related to the use of such variables. If men and/or women choose their spouses according to the expectations they have on the power profiles that will result in the households from the marriages, then assets at marriage may be in fact endogenous due to the selection of spouses into marriage (Thomas, Contreras, and Frankenberg 2002).

In the social context of Egypt, about three quarters of the costs of a marriage arrangement are supported by the groom and his family, while the bride and her family's contribution is in small home furnishing, the *gihaz* (trousseau) (Rashad, Osman, and Roudi-Fahimi 2005). Since these contributions are parts of the arrangements conditioning the marriage, their potential effects on subsequent behaviors within the household may be argued to be expected and initially taken into account by the parties involved in the marriage contract. This is the

selection problem discussed above.

A test strategy derived from the above observations will be based on the assumption that human capital, proxied by education, is essentially brought to marriage and not built within the marriage. Using instrumental variables estimation technique, we first, estimate the following regression model of proxies of child welfare (ICO) on husband and wife education, their contribution to marriage cost and other control covariates including household wealth, duration of marriage, and child characteristics; using the husband's and wife's parents' education and other variables as instruments.

$$IOC_{ih} = \beta_0 + \beta_1 C_{ih} + \beta_2 M_h + \beta_3 F_h + \beta_4 S_h + e_{ih} \tag{6}$$

where ICO_{ih} is a measure of child i in household h welfare; C_{ih} is a vector of child i characteristics; M_h and F_h are vectors of exogenous mother's and father's human and physical resources, respectively; S_h is a vector of household characteristics; and e_{ij} is the error term.

Once the estimation is completed, the null hypothesis in the relevant test is whether, controlling for household wealth, the share of marriage costs and education of the wife and husband have significant specific effects on child welfare. Thus, testing the unitary model would involve testing the inequality of β_2 and β_3 coefficients. The rejection of the null hypothesis will be taken as an evidence against the unitary model. Note that in a linear context (i.e. if the regression is linear), the null assumption is equivalent to equal influence of wife and husband human and physical capital on child welfare. If the unitary model is rejected, then we proceed to examining the implication of the assumption that allocations are Pareto efficient. We shall perform these test in the following section after a brief description of our data.

2   Data and Empirical Results

The analysis in this paper relies on data from the 2006 Egypt Labor Market Panel Survey (ELMPS 06).[7] The ELMPS 06 is a follow up survey to the ELMS 98. Both surveys were conducted by the Economic Research Forum (ERF) in cooperation with the Egyptian Central Agency for Public Mobilization and Statistics (CAPMAS). ELMS 98 was carried out on a nationally-representative sample of 4,816 households. The ELMPS 06 is the second round of what is intended to be a periodic longitudinal survey that tracks the labor Market and demographic characteristics of the households and individuals interviewed in 1998, any new households that might have formed as a result of splits from the original households. The ELMPS 06 sample consists of a total of 8,349 households distributed as follows: (i) 3,684 households from the original ELMS 98 survey, (ii) 2,167 new households that emerged from these households as a result of splits, and (iii) a refresher sample of 2,498 households. Of the 23,997 individuals interviewed in 1998, 17,357 (72 %) were successfully re-interviewed in 2006, forming a panel that can be used for longitudinal analysis. The 2006 sample contains an additional 19,743 "new" individuals. Of these 2,663 individuals joined the original 1998 households, 4,880 joined the split households, and 12,200 were part of the refresher sample of households.

The ELMPS 06 provides detailed information on the household housing conditions, ownership of durables, access to basic services and the neighborhood infrastructure. It also contains a great deal of information on the household members' education, employment status, time allocation, earnings, job mobility, migration and household enterprizes. Moreover, the ELMPS 06 includes a new module on women empowerment that provides detailed information on women's decision making, access to cash resources, mobility, time allocation, working status, marriage cost and assets brought into marriage. This new module allows a comprehensive investigation of women's roles within the household, along with the barriers and opportunities

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[7]The data description presented in this section highly depends on Assaad (2007), see Assaad (2007) for more details on the ELMPS questionnaires and sample selection

that women face in the labor market–including the changing conditions in their own households as well as changes in the economic environment.

This paper uses the ELMPS 06 data to test whether in Egypt husband's and wife's physical and human capital have different effects on the intrahousehold allocation outcomes that are related to child investment. We focus on two measures of child welfare within the household: child education attainment and child work status. The educational outcome employed in the analysis is the deviation of the child's completed years of schooling from the cohort mean. While the total number of hours of both domestic and labor work, as reported by the child him/herself, is used to analyze children's work outcome.

After reviewing the literature and carefully examining the correlations among the predetermined variables, we decided to employ the set of variables discussed in the following. Table 1 presents the descriptive statistics of the selected set of variables). Data availability was also an important constraint in this analysis.

To measure parents' human capital in education, we use three dummy variables for each of the mother and husband: one for whether each of them has some basic education, one for whether each of them has secondary education, and the other for whether each of them has above secondary education. While, parents' economic power are proxied by the share of each of them and/or their families in marriage cost–specifically the *gihaz* cost.

A variable for the duration of marriage is used in the regression to account for the intergenerational cultural and institutional differences in marriage arrangements and costs. The household characteristics include a measure of household living standard and a dummy for households residing in rural areas. The household living standard is measured by a wealth index, which uses information on household assets. Four dummies for household with high and medium wealth interacted with urban and rural residence are used to account for household wealth. The model also controls for child's age and sex. Table 1 shows the descriptive statistics of the set of variables employed in the regression analysis.

The ELMPS 06 data show that in Egypt more than 13% of children of age 6-14 have never attended school. Accordingly, to account for incomplete schooling decisions, the deviation

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of each child's completed years of schooling from the cohort mean is used as an individual-educational outcome. This specification allows us to measure how well each child is doing relative to other children of the same age, and is not prone to censoring unlike schooling attainment which could be censored at zero if many children have never been to school. We restrict the sample to children residing in the household with both parents. Also, the sample is restricted to children below age 15, in order to minimize the effect of selection bias which might occur due to early marriages–since children, particularly girls in Egypt, tend to leave both school and parents' home after getting married (Quisumbing and Maluccio (2000)).

Table 2 and 3 present the results of the 2SLS regression models of children schooling attainment and hours of work. The tables show that the daughter dummy is positive and significant only in the schooling model. Thus parents differentiate between boys and girls schooling–in favor of boys–but they do not differentiate between the boys' and girls' working hours. The effect of father's education on child schooling and work is more pronounced than that of mother. Mothers education has no significant effect on either child schooling or work. However, fathers with secondary or higher education positively and significantly affect children schooling attainment–in comparison to fathers with no education. While any schooling level of father significantly decrease child's hours of work.

In contrast, controlling for current family wealth, the effect of the mother's and/or her family contribution to the cost of marriage has a stronger effect, both in magnitude and significance, on child schooling and hours of work than that of the father and/or his family. The higher the mother's and/or her family contribution to the cost of marriage the higher the education attainment of her children and the lower their hours spent in work; however, the higher the father's share decrease his children educational attainment and increase their working hours.

Concerning the household characteristics variables, the table shows that the child schooling attainment significantly increases with household wealth both in urban and rural areas. While household wealth does not show additional significant effect on child hours of work, except for households on the higher levels of the wealth distribution and living in urban areas.

Test of unitary model

The F-tests at the bottom part of each table suggests that there exists a significant difference between the father's and mother's contribution to marriage cost on child schooling and hours of work. However, the effect of mother and father education are only significantly different in the child's work model.

These results provides evidence that the unitary model does not characterize the Egyptian families. In other words, the influence of the mother's and father's human capital may differently affect the child welfare–specially the child education attainment.

Test of Pareto efficient model

Since the unitary model in not rejected, with regards to parents economic power as proxied by the share of marraige costs, we turn now to testing the Pareto efficient model. We use the following non-linear Wald statistics to test whether in (6) the ratio β_{2m}/β_{3m} is constant across the schooling (s) and work models (w), $m = s, w$. Since, this ratio approaches infinity as β_{3m} approaches zero, which causes the test to lack power (Thomas, Contreras, and Frankenberg 1999), the test is transformed to $\beta_{2s}\beta_{2w} - \beta_{3s}\beta_{3w} = 0$.

$W = r'[RVR']^{-1}r$

where R is the derivative of the restriction vector, r, with respect to the coefficient of share of marriage costs. V is the estimated variance-covariance matrix. The ratio of share costs effects and the test statistics are presented in Table 4.

The ratios of share of marriage costs effects in the schooling and work models are fairly close. The test statistics suggests that we can not reject the assumption of Pareto efficient model or the proportionality of the coefficients of the two models. Hence, although fathers and mothers in Egypt appears to have different preferences towards the welfare of their children, it is not possible to reallocate resources within the household so that one person is better off without making at least another person worse off.

3　Conclusion and Remarks on Forthcoming Studies

This paper is the second in a series of studies aiming at investigating in depth the interlinkage between the intrahousehold decision-making and child welfare. The first paper focuses on providing the historical and cultural background and literature review; and highlighting the methodological problems that ensue when modeling the link between allocation of resources, women empowerment and child investment within the household. This second paper focuses on the empirical modeling of the effect of women's bargaining power within the household, measured by their educational level and their relative share of marriage cost at the time of marriage, on child's education and child's hours of work.

We start this paper by a brief discussion of the theoretical modeling and proxies of bargaining power available in the data. We focus in this analysis on a source of economic power which has recently been examined in the literature, but, to the best of our knowledge, has not been previously investigated in Egypt, which is the the share of resources that husbands and wives bring to marriage.

The paper examines the effect of parents' education and contribution to the cost of marriage formation on children education attainment and hours of work. The analysis shows that both parents may not always have identical preferences towards children. The higher the women education level and the higher her contribution to marriage cost the better her children schooling attainment and the lower the child's working hours. Thus, the results show that the unitary model does not appear to adequately characterize the Egyptian family. Accordingly, we turned to testing the implication of the assumption that the allocations are Pareto efficient. We find that although couples do not agree on resource allocation, but the allocations are Pareto efficinet. In other words, couples cannot reallocate the household resources to make a household member better-off without making least another member worse-off.

The finding of this paper urge the need to strengthen the investigation of the effect of women status within the household, using collective models of household labor supply. This is the main objective of the future papers in this series.

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Table 1: **Descriptive Statistics of Variables Used in the Regression Models**

Variable	Mean/percent	Std. Dev.	Min	Max
Child characteristics				
Years of schooling deviation from cohort mean	0.00	1.18	-7.82	6.26
Age	10.03	2.49	6.00	14.00
Females	48.94%			
Number of siblings	3.25	1.87	0.00	24.00
Mother variables				
Age	37.39	6.70	4.00	72.00
Edu.: Primary or incomplete secondary	38.14%			
Edu.: Secondary completed or higher	12.26%			
Share of marriage cost	86.78	48.50	0.00	200.00
Number of siblings	5.46	2.47	-3.00	31.00
Mother's edu.: Primary or incomplete sec.	14.48%			
Mothers edu.: Sec. completed or higher	2.19%			
Father's edu.: Primary or incomplete sec.	34.06%			
Fathers edu.: Sec. completed or higher	7.62%			
Father variables				
Age	44.33	7.77	24.00	87.00
Edu.: Primary or incomplete sec.	42.44%			
Edu.: Sec. completed or higher	18.59%			
Share of marriage cost	102.20	50.24	0.00	200.00
Number of siblings	5.45	2.55	0.00	25.00
Mother's edu.: Primary or incomplete sec.	12.90%			
Mothers edu.: Sec. completed or higher	1.30%			
Father's edu.: Primary or incomplete sec.	32.82%			
Fathers edu.: Sec. completed or higher	6.52%			
Household characteristics				
Urban (Omitted category=rural)	51.93%			
Household Wealth	2.91	1.46	1.00	5.00
Household size	1.83	0.31	1.10	3.04

Table 2: **Regression Results of Children Educational Attainment, 2SLS estimates**

Variable	Coeff.	S.E.
Child characteristics		
Daughter	-11.257*	6.512
Age	1.825	6.794
Age square	-0.026	0.336
Mothers education attainment (Omitted Category= No Education)		
Basic Educaton	13.187	9.274
Secondary	13.691	8.956
Above Secondary	6.268	12.349
Daughter * Basic Educaton	2.907	12.271
Daughter * Secondary	-5.043	11.851
Daughter * Above Secondary	-2.521	16.017
Fathers education attainment(Omitted Category= No Education)		
Basic Educaton	12.548	8.000
Secondary	15.141*	8.855
Above Secondary	18.449*	10.451
Daughter * Basic Educaton	23.251**	11.696
Daughter * Secondary	12.472	12.216
Daughter * Above Secondary	16.483	14.937
Parents contribution to marriage cost		
Mother's Share	0.439**	0.214
Father's Share	-0.306*	0.166
Marriage Duaration	-0.620	0.430
Household characteristics		
Urban (Omitted category=rural)	1.712	10.834
Household Wealth (Omitted = Lowest Urban/Rural Quintiles)		
Medium Urban Quintile	20.049*	10.764
High Urban Quintile	46.415***	10.649
Medium Rural Quintile	22.260***	7.450
High Rural Quintile	46.991***	8.677
Constant	-53.254	36.939
Number of Children	3941	
F-tests		
Mothers Basic education = Fathers Basic education 16	0.00	
Mothers secondary education = Fathers secondary education	0.01	
Mothers above secondary education = Fathers above secondary education	0.35	
Mothers share of marriage cost = Fathers share of marriage cost	4.35**	

Dependent variable: Deviation of the childs completed year of schooling from the cohort mean.

$***p < 0.01; **p < 0.051; *p < 0.10$

Table 3: **Regression Results of Child Hours of Work, 2SLS estimates**

Variable	Coeff.	S.E.
<u>Child characteristics</u>		
Daughter	0.754	0.587
Age	-0.912	0.612
Age square	0.083***	0.030
<u>Mothers education attainment</u> (Omitted Category= No Education)		
Basic Educaton	0.470	0.836
Secondary	0.181	0.806
Above Secondary	0.863	1.112
Daughter * Basic Educaton	-0.411	1.106
Daughter * Secondary	0.357	1.068
Daughter * Above Secondary	-1.165	1.443
<u>Fathers education attainment</u>(Omitted Category= No Education)		
Basic Educaton	-2.285***	0.721
Secondary	-2.887***	0.798
Above Secondary	-2.529***	0.941
Daughter * Basic Educaton	0.797	1.054
Daughter * Secondary	0.730	1.101
Daughter * Above Secondary	0.635	1.346
<u>Parents contribution to marriage cost</u>		
Mother's Share	-0.045**	0.019
Father's Share	0.025*	0.015
Marriage Duaration	-0.014	0.039
<u>Household characteristics</u>		
Urban (Omitted category=rural)	-1.694*	0.977
Household Wealth (Omitted = Lowest Urban/Rural Quintiles)		
Medium Urban Quintile	-0.671	0.970
High Urban Quintile	-2.948***	0.960
Medium Rural Quintile	-0.872	0.672
High Rural Quintile	-0.592	0.782
Constant	8.428**	3.330
Number of Children	3941.000	
F-tests		
Mothers Basic education = Fathers Basic education 17	4.66**	
Mothers secondary education = Fathers secondary education	5.35**	
Mothers above secondary education = Fathers above secondary education	4.77**	
Mothers share of marriage cost = Fathers share of marriage cost	3.36*	

Dependent variable: Total hours of domestic and labor work spent by child.

$***p < 0.01; **p < 0.051; *p < 0.10$

Table 4: **Test for Pareto Efficiency**

Model	Ratio of assets effect β_{2m}/β_{3m}
Child education model	-1.434
Child hours of work model	-1.818
Test of Equality of ratios χ^2	0.00***

Calculated from coefficient estimates from Table 2 and 3

$***p < 0.01; **p < 0.051; *p < 0.10$

References

[1] Becker G. (1965): "A theory of the Allocation of Time." *Economic Journal,* Vol. 75, No. 299; pp.493-517.

[2] Bourguignon F., M. Browning, P.-A. Chiappori, and V. Lechene (1993): "Intra Househols Allocation of Consumption: A Model and some Evidence from French Data. " *Annales d'Economie et de Statistique,* N0. 29. Available online at

http://www.adres.polytechnique.fr/ANCIENS/n29/vol29-08.pdf

Accessed in December 2006.

[3] Chiappori P.-A. (1992): "Collective Labor Supply and Welfare." *The Journal of Political Economy*, Vol. 100, No. 3; pp. 437-467.

[4] - (1997): "'Collective' Models of Household Behavior." In Haddad, L., J. Hoddinott, and H. Alderman, eds. (1997): *Intrahousehold resource allocation in developing countries: Methods, models, and policy.* Baltimore, Md.

[5] Economic Research Forum (2005): "Poverty Reduction Strategies in North Africa Country Cases for Egypt, Morocco and Tunisia," Paper prepared for The United Nations Economic Commission for Africa, Juin 14.

http://www.uneca.org/prsp/cairo/documents/NA_Paper.pdf

Accessed in December 2006.

[6] El-laithy, H. (2001):"The Gender Dimensions of Poverty in Egypt." *ERF Working Paper Series*, Working Paper 0127.

http://www.erf.org.eg/uploadpath/pdf/0127_Elleithy.pdf

Accessed in january 2007.

[7] Gericke C.A. (2004): "Comparison of Health Care Financing Arrangements in Egypt and Cuba: Lessons for Health Reform in Egypt."

http://www.ww.tu-berlin.de/diskussionspapiere/2004/dp03-2004.pdf

Accessed in December 2006.

[8] Haddad, L., J. Hoddinott, and H. Alderman, eds. (1997): *Intrahousehold resource allocation in developing countries: Methods, models, and policy.* Baltimore, Md.

[9] Lindbeck, A., (1997):"Incentives and Social Norms in Household Behavior," *American Economic Review*, 87(2), pp. 370-377.

[10] Malhotra, A., S. Schuler, and C. Boender. 2002 "Measuring Womens Empowerment as a Variable in International Development."

http://www.icrw.org/docs/MeasuringEmpowerment_workingpaper_802.doc

Accessed in December 2006.

[11] Mayoux L. (2005): "Women's Empowerment Through Sustainable Microfinance: Rethinking 'Best Practice'."

http://www.genfinance.info/Documents/Mayoux_Backgroundpaper.pdf

Accessed January 2007.

[12] Mosedale, S. (2005): "Assessing Women's Empowerment: towards a conceptual framework," *Journal of International Development* Vol. 17; pp. 243-257.

[13] Quisumbing, A.R. (1994): "Intergenerational transfers in Philippine rice villages: Gender differences in traditional inheritance customs." *Journal of Development Economics* Vol. 43, No. 2; pp. 167-195.

[14] Quisumbing, A. and J. Maluccio (2000): "Intrahousehold Allocation and Gender Relations: New Empirical Evidence from Four Developing Countries." FCND Discussion Paper No. 84, *IFPRI* Washington.

http://www.ifpri.org/divs/fcnd/dp/papers/fcndp84.pdf

Accessed in January 2007.

[15] Rashad H., M. Osman, and F. Roudi-Fahimi (2005): "Marriage in the Arab World." *Population Reference Bureau*.

http://www.prb.org/pdf05/MarriageInArabWorld_Eng.pdf

Accessed in January 2007.

[16] Rodenberg B. , and C. Wichterich (1999): "Empowerment. A Study of the Womens Projects Abroad." Supported by the Heinrich Böll Foundation.

http://www.yepp-community.org/downloads/empowerment/
boell-empowerment.pdf

Accessed in December 2006.

[17] Sen G, and S. Batliwala (2000): "Empowering women for reproductive rights." In: Presser HB, Sen G, eds. *Women's empowerment and demographic processes.* New York: Oxford University Press.

[18] Sen, G., and C. Grown (1987): *Development, Crises, and Alternative Visions: Third World Womens Perspectives.* New York: Monthly Review Press.

[19] The World Bank (2002): "Arab Republic of Egypt Poverty Reduction in Egypt. Diagnosis and Strategy." Joint report of the Ministry of Planning, Government of the Arab Republic of Egypt, and The World Bank. June 29.

```
http://www-wds.worldbank.org/servlet/WDSContentServer/
WDSP/IB/2002/08/23/000094946_02080904030162/Rendered/
PDF/multi0page.pdf
```

Accessed in December 2006.

[20] Thomas, D., D. Contreras, and E. Frankenberg (1999): "Distribution of Power within the Household and Child Health."

```
http://chaka.sscnet.ucla.edu/IFLS/ppr/atmarr3.pdf
```

Accessed in January 2007.

[21] UNDP Regional Bureau for Arab States (2006): *The Arab Human Development Report 2005. Towards the Rise of Women in the Arab World.* UNDP.

```
http://www.undp.fi/julkaisut/AHDR2005_full.pdf
```

Accessed in january 2007.

[22] UNICEF (2006): *The State of the World's Children 2006.* UNICEF.

```
http://www.unicef.org/sowc07/docs/sowc07.pdf
```

Accessed in January 2007.

[23] United Nations Egypt (2005) *UN Common Country Assessment. Embracing the Spirit of the Millennium Declaration.*

`http://www.undg.org/documents/6757-Egypt_CCA.pdf`

Accessed in December 2006.

[24] Yount K.M. (2005): "Resources, Family Organization, and Domestic Violence Against Married Women in Minya, Egypt." *Journal of Marriage and Family,* 67; pp. 579596.

[25] Zuhur S. (2003): "Women and Empowerment in the Arab World," *Arab Studies Quaterly,* Vol. 25, No.4, pp. 17-38.