Time Allocation between Paid and Unpaid Work of Married Women: A Case Study of Madurai in South India

S. Mumtaj Begum

Lady Doak College, India

Abstract: Given that more working hours devoted to family production implies less working hours available for market work, female time allocation for market work, family production and leisure certainly constrains female participation in paid employment. Therefore, female non-market production is a very important dimension of their relative economic position. Using field data, the paper examines the effect of socio-economic and demographic characteristics on the time allocation between paid and unpaid work of married women through maximum likelihood Tobit estimates of the labour supply function and multiple regression analysis for Madurai District, Tamil Nadu. Woman's employment and the family composition (size of the family esp. presence of pre-school age children and dependent adults) are decisive factors, sifting the division of paid and unpaid work in the households and in the whole of the society. Women spend less time on paid work but more time on housework when they are married and become mothers. Therefore being married means more housework for women and less market work or personal work/activities.

Keywords: Paid work, Unpaid work, Market and non-market activities, Work participation, Labour supply

1   Introduction

Women have to perform the multifaceted roles of household non-paid work and also the paid work outside home compelled by economic necessity. Thus, women enter in the labour market with a huge burden of unpaid domestic work on their head. Historically, family production was generally performed by females. However, family production does not generate any direct monetary income, thereby giving no economic independence to female family members. This is especially true in developing countries (see Evenson, 1978; Goldschmidt-Clermont, 1987; Sivakami 2006). Home economics assumes a family as a utility maximiser, maximising household utility subject to family budget and time constraints. It does not take the relative economic position of each family member into account (see Becker, 1965; Gronau, 1980). Household production of non-marketed goods and services is a family necessity. Given that more working hours devoted to family production implies less working hours available for market work, female time allocation for market work, family production and leisure certainly constrains female participation in paid employment. Therefore, female non-market production is a very important dimension of their relative economic position.

Madurai District, the second largest district in the state of Tamil Nadu, comprises people from varied socio-economic and cultural backgrounds. Moreover, Madurai District reflects the characteristics of modernity in juxtaposition with traditional outlook.

2   Sampling Design

Madurai, the second largest district, in the state of Tamil Nadu comprises of seven Taluks, namely Peraiyur, Usilampatti, Madurai South, Madurai North, Melur, Vadipatti and Tirumangalam. The required samples were chosen by adopting a three stage stratified sample with taluk as the first stage, village panchayat/town panchayat/municipal corporation as the second stage and household as the third stage sample unit. The required sample size of 600 was equally divided between taluks and within each taluk, between rural and urban areas. In each taluk, the constituent village and town panchayats/municipal corporation was listed along with statistics on female work participation. The villages and towns (one each) with the highest and lowest female work participation were selected to represent the rural and urban areas in each taluk. Therefore, two villages and two towns (four in all) were selected from each taluk. The female occupational

structure of each locality was mapped out in consultation with local administrative authorities and from the secondary data available in the village and town directories of the Census 2001 publication. A sample of about 30 households was taken from each locality with equal representation of respondents who were working and non-working currently married women with at least one living child. Widows, divorced, separated and deserted women were not included in the sample. Due weightage was given to the representation of major regional occupations.

3 Collection of Data

A structured schedule consisting of questions pertaining to all the variables included in the study was used to collect the required data through direct personal interviews. A pilot study was conducted to test the validity and reliability of the schedule. The period of study was 2004 – 2005.

4 Tools of Analysis

A woman is expected to perform a number of tasks in a day and given the constraint of time, her allocation to various activities would depend on the requirements and the relative priorities. With this in mind, information about time input on all activities is collected from all married women respondents in the survey. Women are asked to report the tasks that they perform on a normal day starting from the time they rise till they sleep at night. A time chart or 24 hours time diary form is used to list the activities that are carried out by women throughout the day. The time chart accounts for the total time used by the woman. From this, time input on specific activities is calculated. This includes time input on market activities by working women and other household activities, child care activities (cooking, washing, cleaning and day-to-day need shopping for household) and personal activities (talking to neighbour, watching TV, listening to radio, eating and sleeping) by both working and non-working women. The mean time spent by a married woman on household activities, childcare and personal activities per day is calculated for both working and non-working married women in urban and rural areas in order to know how much time married women invest on non market activities. In order to see if the difference in time input between working and nonworking women is significant, the test for equality of means has been performed for each pair (working and non-working) for rural and urban areas separately.

To identify factors that determine the supply of market time of married women, female work participation in terms of hours spent on market activities per day by married working women is taken as a dependant variable and all the time variables included in the study, namely time spent on household, child care and personal activities along with the socioeconomic and demographic variables, are taken as explanatory variables. The analysis is done separately for rural and urban regions of Madurai District.

Multiple regression, taking labour force participation as a dependent variable is also carried out to identify the statistically significant predictor variables that influences married women's work (both working and non working) in rural and urban regions of Madurai District. Regressions are run taking data for all the variables included in the labour supply analysis. The independent variable - married women's wage - is the predicted hourly wage rate. A problem associated with this variable is that it is not observed for women who do not work in the market. This necessitates imputing a wage rate based on estimates of earning functions obtained from a sample of working women which will lead to the problem of sample selection bias. Such a sample bias is corrected using Heckman's method.

5 Time Input on Various Activities and Women's Participation in Work Force

Women's time input on various activities is provided in this section first in order to find out the married women's allocation of time on various activities and the difference in the variation in the allocation of time between working and non-working married women. Mean time input on four main activities is given in Table 1.

It should be noted that mean time input on various activities by working women includes time input on market activities. As the nature of job differed between urban and rural areas, there is difference in the time

Table 1 Mean Time Spent on Market and Non-market Activities per day by Work Status of Married Women (in hours)

Activities	Rural		Urban		Overall	
	Working Women	Non Working Women	Working Women	Non Working Women	Working Women	Non Working Women
Household activities	5.01	7.79	4.91	8.17	4.96	7.98
	(t = 11.70; p = 0.000)		(t = 12.75; p = 0.000)		(t = 17.30; p = 0.000)	
Child Care	2.89	4.51	3.11	5.15	3.00	4.83
	(t =6.09; p = 0.000)		(t = 7.91; p = 0.000)		(t = 9.84; p = 0.000)	
Leisure and Personal activities	7.68	11.62	8.07	10.67	7.88	11.15
	(t =12.63; p = 0.000)		(t = 7.87; p = 0.000)		(t = 14.30 ; p = 0.000)	
Market Activities	8.42	0.00	7.89	0.00	8.16	0.00
	(t = -62.02; p = 0.000)		(t = -77.09; p = 0.000)		(t = -94.61; p = 0.000)	
Number of Observations	300		300		600	

Note:

- Leisure and Personal time includes talking to neighbour, watching TV, listening to radio, eating and sleeping.
- Figures in parentheses are 't'-values (test statistics for equality of means for working and non-working women) and corresponding 'p'- values

spent on market activities among working women between rural and urban areas. Most working women in rural areas belong to the unorganised sector which has also contributed to a higher time for market activity.

In order to see if the difference in time input between working and non- working women is significant, the test for equality of means has been performed for each pair (working and non-working). The test statistics and the corresponding p-values are shown in parentheses below the respective means in the table 1. It is evident from table 1 that rural married women spent more time for household activities, personal activities and market activities and less time for child care as compared to their counterparts in urban areas of Madurai District. The time spent on household activities is lower among the urban working women due to modern labour saving devices/conveniences. At the same time, the time spent on personal activities is low due to more time allocation for child care in urban areas. This is due to the fact that urban families are mostly nuclear families and hence there are no family people to share in taking care of children whereas in rural areas, child care is shared by other members in the family. In urban areas the mother has to spend time playing with the child while in the rural areas such activities is usually taken care of by the other children in the family who form natural companions and infants are usually taken care of by the elders in the family.

6 Time Allocation for Non-Market Work (Family Production) by Working and Non-Working Married Women

As 24 hours is the maximum that an individual can devote to market work, non-market family production and leisure each day, time allocation for family production mirrors time allocation for market production. Hence, theoretically, any variable affecting women's work participation (such as a wife's market earnings, husband's earnings, family non-earning income, wife's education level, her age and other family background variables) may have the opposite impact on women's time allocation for family production.

The time allocation functions for non-market work such as household tasks, child-care activities and personal activities are estimated by the method of ordinary least squares (OLS) and presented in Table 2. However, in case of market activities, OLS cannot be applied since 50% of married women in the sample do not spend their time on market activities and hence the dependent variable is truncated and bounded at zero. Therefore, the maximum likelihood Tobit method is used to estimate the market activities equation.

Table 2   Regression Estimates of Demand for time to Non Market Work of Married Women (Working and Non Working) in Madurai District

Variable	Rural			Urban		
	CC	HHA	PA	CC	HHA	PA
(Constant)	-8.934 (2.990)	-3.015 (1.022)	17.772 (4.428)	-59.816 (8.930)	-49.128 (-6.597)	93.966 (9.904)
Age of the Respondents	-2.884 (8.833)	-1.902 (5.898)	2.044 (4.661)	-11.492 (10.155)	-8.970 (7.129)	13.856 (8.644)
Age Square of the Respondent	0.057 (8.920)	0.040 (6.238)	-0.040 (4.624)	0.204 (10.187)	0.159 (7.141)	-0.247 (8.698)
Education of the Respondent	5.314 (8.976)	3.656 (6.253)	-3.694 (4.645)	18.357 (10.276)	14.784 (7.444)	-22.466 (8.878)
Number of adults in the household	-0.140 (1.543)	-0.159 (1.781)	0.445 (3.656)	-0.072 (0.681)	-0.111 (-0.945)	0.085 (0.568)
Number of children in the household	0.077 (0.389)	0.224 (1.153)	-0.249 (0.941)	0.438 (2.601)	0.257 (1.375)	-0.696 (2.921)
Husband's occupation	-0.402 (2.169)	-0.066 (0.359)	0.425 (1.709)	-0.085 (0.489)	-0.468 (2.426)	0.149 (0.608)
Family income	-0.001 (1.636)	-0.001 (2.402)	0.001 (0.631)	-0.001 (2.020)	-0.001 (-1.700)	0.001 (1.742)
Hired help for Household Activities	-0.730 (1.652)	-0.268 (0.534)	0.232 (-0.635)	-0.330 (1.335)	-0.815 (-2.965)	1.008 (2.879)
Hired help for Child Care	-0.449 (1.974)	0.365 (1.352)	4.774 (9.617)	-1.673 (3.929)	0.214 (0.453)	6.746 (11.184)
Respondent's Wage	-0.005 (8.859)	-0.001 (6.551)	0.003 (4.498)	-0.012 (10.238)	-0.010 (7.422)	0.015 (8.868)
Age of the last child	-0.029 (0.877	-0.032 (1.102)	0.003 (0.079)	-0.109 (3.672)	-0.067 (2.035)	0.087 (2.072)
R^2	0.585	0.621	0.610	0.662	0.666	0.584
F	13.629	62.429	15.509	20.461	20.859	13.528

Note: CC - Child Care; HHA - Household Activities; PA – Personal Activities
Absolute t values in parentheses

The OLS estimates of non-market work are presented in Table 7.2. The non-market unpaid work includes the following activities.

a)   Household activities (preparation of meals, laying the table or doing the dishes, laundry and ironing, shopping and cleaning)

b)   Child-care tasks (washing or dressing, feeding, transportation to school, to doctors or playmates, playing, reading, homework) and

c)   Personal activities (relaxing, talking to friends / neighbours, eating, watching TV, listening to music and sleeping).

The analysis of the results of regression estimates reveal that there is a negative relationship between the age of the respondent and the time spent on household and childcare activities whereas the relationship between the age of the respondents and the time spent on personal activities is positive. The signs of the variable "age squares of the respondents" explain that as the age of the respondent increases, the time spent

on household and childcare activities decreases at an increasing rate while the time spent on personal activities increases at an increasing rate This is due to the fact that as children grow up, child care activities reduce and as the children start helping with household activities, there is an increase in the time spent on personal activities.

The co-efficient of number of adults in the household is significant for married women's time on personal activities. However the signs of the co-efficient reveal that the presence of more number of adults reduces the married women's time on household and child care activities, while it increases the time for personal activities. This may be due to the support extended by the old people at home in managing the house and taking care of children. While the increase in the number of adults reduces the time allocation of married women for household and childcare activities, the increase in number of children increases the time allocation for both household and child care activities which in turn reduces the time for their personal activities.

Time allocation for the household and childcare activities is observed to increase with the increase in married women's educational level while the time allocation for personal activities decrease with the increase in the educational level of the married women. This implies that the education gives the awareness to the married women about hygiene and hence she spends more time in maintaining the house, the children and also spends time tutoring her children. Another factor is that an increase in educational level of the married women is negatively associated with family size which implies that educational level of the married woman is positively associated with nuclear families. An increase in education results in the desire for more autonomy and empowerment, and hence the joint family disintegrates resulting in an increase in the time spent on household activities and child care.

The family income has a negative effect on the time spent on household activities and child care while it has a positive effect on time spent for personal activities. Husband's occupation also has a similar effect as family income on non market work. Higher the husband's level of occupation, higher will be his income. Higher income means higher affordability to hire help for non-market work. As a result, married women can afford to spend more time for personal activities. The negative coefficient of husband's occupation also indicates that the intra family time allocation decisions are interdependent.

Wife's wage is negatively and significantly associated with the time spent on household activities and child care activities whereas it has a positive effect on time allocation for personal activities. This is again the result of affordability to hire help for non-market work

Hired help for household activities and child care activities also reduces the allocation of time for non-market work by the married women.

All the chosen independent variables have a similar expected effect on both rural and urban married women's time allocation for non-market work.

It is evident from the above discussion that the education of the respondent and the number of children in the household increase the married women's time in household and child care activities whereas the own wages earned, husband's occupation, the family income and help taken/hired for household and child care activities have a negative effect on the married women's time allocation for non-market work.

7   Market Work of Married Women in Madurai District

In the present study, time is considered to be allocated to market and non-market work. While non-market work is unpaid work, market work is paid work which is defined as "every activity that generates an income." In the present study, a woman is thus classified as working if she has a positive income from labour. The above discussions present the predicted relationship between the chosen socio-economic and demographic variables and female time allocation for home production. The opposite impacts are clearly shown in the following section where the relationship between female work-participation, chosen socio-economic and demographic variables and female time allocation are discussed.

The regression estimates of allocation of time to market work (paid work) by the married working women given in Table 3 clearly explain that there is a negative relationship between the time allotted for

Table 3   Regression Estimates of Demand for Time to Market Work of Married Working Women by Rural-Urban Residence in Madurai District

Variables	Rural		Urban	
	Beta	t	Beta	t
(Constant)	23.86	11.07*	13.88	6.714*
Age of the Respondent	1.617	3.21*	0.111	0.179
Age Square of the Respondent	-1.685	3.32*	-0.156	0.249
Education of the Respondent	0.123	4.90**	0.055	3.713*
Occupation of the Respondent's husband	-0.212	3.11*	-0.029	0.350
Total Family income	-0.181	2.57*	-0.010	0.114
Time taken for household activities	-0.503	6.92*	-0.391	4.305*
Time taken for Childcare	-0.396	5.96*	-0.353	4.222*
Time taken for personal activities	-0.724	9.52*	-0.606	6.106*
R^2	0.69		0.49	
F	16.25*		5.6*	
Number of Observations	150		150	

* $p<.05$;   ** $p<.10$

non-market work and the market work. Thus, higher the time allotted for non-market work, lower will be the time available for market work and vice versa. Considering the regression results given in Table 2, it could be inferred that the variables affecting women's work participation such as a wife's market earnings, her education level, age, husband's occupation, family income, and other family background variables have the opposite impact on women's time allocation for family production as 24 hours is the maximum that an individual can devote to market work, non-market family production and leisure each day.

The maximum likelihood estimates of the market time allocation function are shown in Table 4. The estimated co-efficients have the expected signs and indicate that years of education of married women and her earnings exert a positive effect on time allocation for the market work whereas husband's occupation and family income have a negative effect on married women's time allocation for market work in both rural and urban areas. Number of children in the household and number of children in the age group of 0-6 have a negative significant effect on urban married women respondents as the married women in urban areas are forced to spend more time with children (See Table1). That is the reason why number of children in the household and number of children in the age group 0-6 are statistically significant only for urban married women.

Thus, it is very clear from the above discussions that Madurai District being tradition bound, all married women like to spend a considerable amount of time in home production (household and child activities). When married women decide to participate in labour market, they decide so by reducing mainly the time available for their personal activities and to some extent by reducing the time available for household and child care activities which are sometimes compensated by hired help. Thus there is a negative relationship between the time spent for home production and the time spent for market production.

The parameter estimates of market production equation suggests that the own wage, Age, Education and hired help for child care have a positive effect on labour time of the married women whereas Husband's Occupation and Family Income have a negative effect on the demand for time for market production. This is true for both rural and urban married working women. Number of children in the Household and Number of children in the age group 0-6 are statistically significant only for urban married women and these

Table 4   Maximum Likelihood Tobit Estimates of the Labour Supply Function

Variable	Rural		Urban	
	Estimated Coefficient	t values	Estimated Coefficient	t values
Respondent's Age	0.244	27.12*	0.135	3.298*
Age Square	-0.003	20.45*	-0.001	2.030*
Respondent's Education	0.229	20.03*	0.103	4.028*
Husband's Occupation	-0.038	3.62*	-0.170	3.048*
Family Income	-0.018	1.03	-0.001	5.538*
Number of Adults in the Household	0.004	0.70	0.017	0.490
Number of children in the Household	-0.005	0.34	-0.249	4.428*
Number of children in the age group 0-6	-0.010	0.77	-0.136	1.968*
Hired help for Household Activities	0.013	0.34	0.044	0.550
Hired help for Child Care	0.269	15.16*	1.025	7.378*
Log Wage	1.453	9.63*	0.194	5.108*
Constant	10.735	24.18*	11.488	14.098*
-2 log likelihood	171.209		-277.793	
Number of Observation	300		300	

* p<.05;   ** p<.10

variables exert a negative effect on time allocation for paid work. This implies that higher the number of children in the household - especially children below the age of six, lower will be the time spent for market production or personal activities.

8   Conclusion

Therefore from the above discussions, it is evident that women's employment and the family composition (size of the family esp. presence of pre-school age children and dependent adults), are decisive factors, sifting the division of paid and unpaid work in the households and in the whole of the society.

References

Becker, G.S. (1965). 'A Theory of the Allocation of Time', *Economic Journal* Vol. 75, pp. 493-517.

Evenson, R. (1978). 'Time Allocation in Rural Philippine Households', *American Journal of Agricultural Economics* Vol. 60, pp. 322-330.

Goldschmidt-Clemont, L. (1987). 'Valuing Domestic Activities', Paper submitted to the Second ECE/INSTRAW Joint Meeting on Statistics of Women, Geneva.

Gronau, R., (1980). 'Leisure, Home Production, and Work: the Theory of the Allocation of Time Revisited', In: *Rural Household Studies in Asia*, H.P. Binswanger, R.E. Evenson, C.

Malathy, R. (1994). 'Education and Women's Time Allocation to Nonmarket Work in an Urban Setting in India', *Economic Development and Cultural Change* Vol. 42, No. 4. (Jul., 1994), pp. 743-760.

Shelton, B.A. (1992). 'Women Men and Time: Gender Differences in Paid Work, Housework and   Leisure', (Contributions in Women's Studies 127), Greenwood Press: New York.

Sivakami, M. (2006). 'Are working mothers in India investing less time in the next generation?' [Unpublished], Presented at the Population Association of America, 2006 Annual Meeting, Los Angeles, California, March 30 - April 1, 2006. p. 42, [POPLINE Document Number: 317252].