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TIME BUDGETS OF MARRIED WOMEN IN RURAL HOUSEHOLD: LAGUNA

by

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1. Introduction

1.1 Objectives of the Study

This paper is a study of the use of time as a productive economic resource, that is, its allocation subject to economic constraints and objectives. The specific purposes of the study are:

1. To present a theoretical framework for the analysis of the allocation of time resources within the household in general, and of the married woman's time resources in particular. This will involve mainly a restatement of Becker's theory of time allocation.[1/]

2. To study empirically the variations that occur in the time budgets of mothers as a consequence

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1/ Becker (1965). Becker's well-known article on the allocation of time was the first major work in this field of study.

of differences in (a) family size and composition; and (b) work status of the mothers.

1.2 Significance of the Study

Before the last decade, economic theory on the household centered on the concept of the household as the consuming sector in the economy. The economic role of the household was, simply put, to maximize the utility derived by consuming goods purchased from the market with the household's given income. It followed that the higher was the household's income, the greater too were its option in consuming baskets of market goods and, hence, the higher its level of utility.

Following this line of reasoning, attempts to improve the welfare status of households or equalize welfare distribution were centered almost exclusively on income levels and the distribution of income. Likewise, much attention was given to labor force participation inasmuch as it directly affected the income status of the household.

Over the past few years, however, developments in welfare theory and in the theory of the household have

led to attempts to introduce measures of welfare and of economic activity that are broader and more comprehensive than income and labor force participation alone. One such attempt is the introduction of 'social indicators' to measure the different aspects of household welfare. New indices of welfare such as measures of health and nutrition or of learning are used to complement the usual income data. In the Philippines this approach is embodied in the recently completed Social Indicators Project of the Development Academy of the Philippines.[2/]

In the area of household economics the significant development has been the introduction of the theory of time allocation. In his pioneering article on what has come to be known as the 'new home economics' Becker (1965) proposes the concept of the household as a producing unit. The products of the household production process are composite goods which constitute the basic welfare needs of the family, e.g., food consumption, care of children, recreation, etc.[3/] The inputs to production are broadly

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[2/] See Development Academy of the Philippines, "Measuring the Quality of Life: Philippine Social Indicators," 1975.

[3/] The values of these welfare goods are measured by the above-mentioned social indicators.

classified as 'market-purchasable goods' and 'time.' In producing welfare goods, the household decides to use its time resources in some combination of three possible alternatives: first, time in market production or income earning activities where the income earned is exchanged in turn for market-purchasable goods; second, time in home production where the household produces goods and services instead of purchasing them from the market or, in some cases, subjects goods purchased from the market to further processing (e.g., cooking food); and third, time in consumption where the household takes time to enjoy the welfare produced (e.g., eating).

The important point here is that time spent at home (or out of the market) may not necessarily be 'unproductive' as far as household welfare is concerned. This point must be appreciated if one is to understand labor force behavior correctly. The decision to participate in market activities is not only a simple choice between work and leisure but, rather, a choice of working in market activities over working at home or not working at all. In other words, labor force participation is really a part of a broader economic decision - the decision of time allocation.

This framework of analysis is especially crucial when one is concerned with the economic activities of married women. The woman, who by force of tradition is usually better trained for household activity than the man, is quite naturally the first choice for the role of 'home-maket' in the family. When young children are present and when no substitute for the mother's time is available then home production by the mother is even more urgent. On the other hand, improved education and better market employment opportunities raise the opportunity cost of non-participation in market production. In addition, the insufficiency of the household's income from other sources (e.g. the husband's income) may make market participation by the mother imperative.

Thus any attempt to increase the participation of women in the market must be made with an understanding of the influence of the above-mentioned factors on the married woman's time allocation decision. The same applies if the objective is to improve the quality of child rearing, nutriture from home prepared food or similar home-produced welfare goods. It goes without saying that fertility analysis would be incomplete without knowledge of the cost of raising children in terms of the mother's

time and, in turn, the contribution to household production time by children themselves when they are old enough to be productive.

The present study attempts to present these interactions between the time allocation of mothers and family size and composition as well as their labor force participation. Outside of the bigger project of which this study is part, there are few existing studies of this nature dealing with Philippine material. In Encarnacion (1973) and Mangahas and Ho (1976) data from the 1968 National Demographic Survey are used to estimate various labor force participation functions for married women. Both these papers present Mincer-type equations where labor force participation is viewed, among other things, as a source of income and an alternative to home production. My own paper on the time allocation of married women [Ho (1976)] is the only study I am aware of that deals directly with the economic aspects of time allocation using Philippine data. This study is basically explanatory in nature and presents the results of a case study of ten households whose time budgets were recorded in detail for one week each.

The unique contribution of the present study is that it presents a more comprehensive analysis of the problem of time allocation, integrating the problems of labor force participation and home production of welfare goods into one basic framework and using a fairly large and complete source of household and time data.

In the section that follows, we present the problem of time-allocation within the framework of the theory of home production and discuss various factors that may determine the allocation of time resources in the household. Section 3 presents a discussion of the data base used in our analysis and some description of the characteristics of the households and the mothers in the sample. In section 4 we report on the time budgets of the mothers noting how these are affected by their working status and by the age and sex composition of the family.

2. Analytical Framework: Time Allocation as Resource Use in Home Production[4/]

2.1 The Household Production Model

The household production model is presented diagramatically in Figure 1 and can be described briefly in terms of five major elements:

1) The household attempts to maximize utility (U) by consuming some combination of 'welfare goods' (Z_i) which are the basic determinants of utility. Thus,

$$U = U(Z_1, Z_2, \ldots, Z_m)$$

2) The household produces these welfare goods using as inputs market purchasable goods (x_i) and time. The time inputs are of two types: home production time (T_{Hi}) and consumption time (T_{Ci}). A Typical household production function would thus be

$$Z_i = f_i(x_i, T_{Hi}, T_{Ci})$$

where x_i is a vector of market goods and T_{Hi} and T_{Ci} are both vectors whose elements are the time inputs of the different household members.

[4/] Except for some minor alterations, this section appears as Section 2 of my earlier paper on time allocation [Ho (1976)]. The ideas presented here are basically those found in Becker's (1965) article on time allocation.

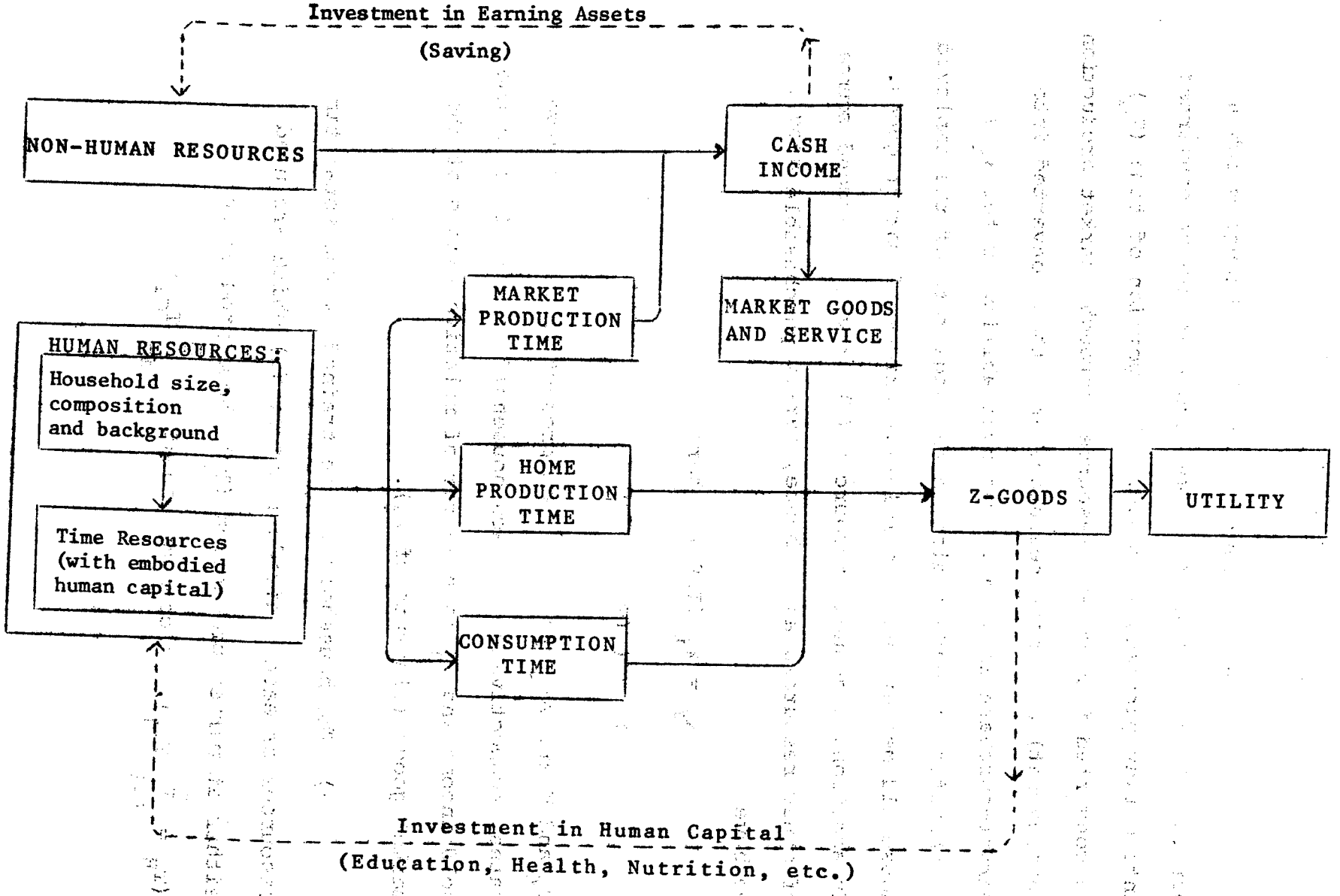

Figure 1. The Household Production Model

3) The market provides a medium through which a portion of the household's time resources may be converted into market purchasable goods. This portion of time (T_M) is converted into money resources through market production (employment) and money resources are then converted into market-purchasable goods. The availability of the x_i's is therefore dependent also on the wage rate of the employed household members and the relative prices of market goods. In addition, non-human resources (V) provide a second source of money resources and, hence, market purchasable goods. We have

$$x_i = x_i\ (I_1 P_i) \quad \text{where}$$

$$I = I\ (T_M,\ W,\ V)$$

T_M and W are vectors of market production time and wage rates, respectively, of each household member, I is household income and P_i is a vector of relative prices of the market goods (elements of x_i).

4) The household is constrained by the total time resources of each individual member (T) which are used either at market production (T_M), home production ($T_H = \sum_{i=1}^{m} T_{Cl}$), or consumption ($T_C = \sum_{i=1}^{m} T_{Ci}$).

Thus

$$T_j = T_{Mj} + T_{Hj} + T_{Cj}^{5/}$$

for every household member j. T_j is the same for each household member and its value depends on the time frame of the analysis.

5) In addition to their direct effects on the household's level of utility, welfare goods (Z-goods) have feedback effects on the productive resources of the household, contributing to the maintenance and growth of the human capital stock of the household. This investment in human capital, together with the household's investment in earning assets constitute the household's total investment.

The household and not the individual is the unit of discussion in the household production model; individual household members are assumed not to have separate utility functions. Rather, they have one common utility function which they attempt to maximize using their pooled resources of time and market goods.

5/ This constraint holds true only on the assumption that the individual time components are mutually exclusive, i.e., that no two activities are done simultaneously. The problem of joint activities is discussed more intensively in section 2.3.

The Z goods which constitute the household's utility function represent indicators of the household's welfare such as food consumption, child care, watching TV, or just relaxing, and differ from the X-goods or market goods that constitute utility in traditional household theory in that they involve time inputs as well as market goods inputs. Some of these Z-goods are necessities (sleep, rest, basic nutriture, etc.) and some of them are luxuries (recreation, watching TV, reading a book, etc.). Furthermore the composition of the household utility function may change over time as tastes change or as family size and composition changes. Thus a family without a very young child will not have the Z-good 'child care' in its utility function while one with a young child will have it as a necessity.

Each Z-good is produced with some combination of market goods, home production time and consumption time. Home producttion time is time which is spent in the provision of a service or the processing of a market good the direct utility from which accrues to one or more household members, not necessarily including the household member who provides the time. This corresponds to what is ordinarily called housework (when this is done by a household member)

and its major component is usually the mother's time. Consumption time is time spent receiving the direct utility of a Z-good and is closest to the concept of leisure.

Market goods and time are clearly substitutable inputs. The Z-good food consumption, for example, may be produced with the market goods uncooked food and with home production time for marketing and cooking, or marketing and cooking time may be replaced instead by the purchased services of hired help, or cooked food may be eaten at a restaurant. In the latter, two cases market goods are substituted for home production time.

The degree of substitutability of home production time and market goods varies Z-goods. Substitution depends not only on the nature of the production function but also on the relative price and on the availability of the market good inputs.

2.2 Time Allocation in the Household Production Process

The household uses its time resources in three ways: consumption, home production or market production. Both market and home production time are 'productive' in the sense that they generate additional utility and hence

contribute to household welfare. In most cases they also generate the disutility involved in work effort. They differ, however, in the manner through which they enter the utility function. While home production time enters the utility function directly, market time enters it indirectly through the market goods and services that are purchased using cash income earned in market participation. Market time can be converted into any market good, including time services (of non-members) that may substitute for home production time. Thus, all home production time can be replaced by market goods if these services are available in the market and if the household has sufficient cash income to purchase them.[6/] In contrast, it is impossible for the household to replace all market good inputs with home production time because of the wide variety of market goods entering the production functions for Z-goods. Thus, while home production time inputs may be zero, market good inputs cannot be zero. However, the household's market production time may still be zero if its cash income from non-human resources are sufficient to purchase all its market good inputs.

[6/] Even the mother's time for breastfeeding is replaced, in some rare cases, by the services of wet nurse.

The most obvious constraint on the time resources of the houseold is that each person has only twenty-four hours in a day. Thus one day's total consumption, home production and market production time for each member must equal twenty-four hours[7/] and total household time resources in a day will equal twenty-four times the number of household members. In addition, there is a lower limit for each individual to the number of consumption hours necessary for producing efficiently.

A more important aspect of time resources, however, is the human capital embodied in each individual household member. The productivity of each unit of time used in any activity is directly related to the investment in human capital that each member has accumulated over his lifetime. This means that household time resources are actually heterogeneous and that a unit of time of one household member may be more productive than that of another member in one activity but less productive in another activity. Thus the household's time allocation decision involves not only allocation among the three types of time uses but also intra-household allocation of

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7/ Assuming the absence of joint or simultaneous activities.

time. The clearest evidence of this is the practice of assigning most home production activities to the mother who is usually better trained for them.

The allocation of each household member's time is thus subject to the optimizing condition that the marginal utilities of the last unit of his time used in different functions are all equal. These marginal utilities are in turn determined by a host of other variables. The size and composition of the household determine not only the availability of substitute time resources within the household but also the form of the utility function. Thus the presence of a very young child will increase the relative marginal utility of home production time since child care is a time intensive Z-good. Increases in one member's wage rate or potential wage rate will raise the marginal utility of his market production time relative to his home production time and relative to the home and market times of other household members. Also an increase in income from non-human resources or an increase in market good prices will reduce the relative marginal utility of all market time.

It is very possible, however, that the equality of marginal utilities may not hold. For instance, when

the choice function for the allocation of time is not continuous (as when one is subject to fixed working hours in market participation), then it may be impossible to equate marginal utilities. A second instance is when the marginal utility of the last unit of home production time and/or consumption time is so large relative to that of the first unit of market production time that the latter is zero.[8/] Both these factors, working separately or together, may best explain why most married women prefer to stay out of the labor market altogether.

2.3 The Problem of Joint Activities

When two activities are done simultaneously by the same individual then our time constraint

$$T_j = T_{Mj} + T_{Hj} + T_{Cj}$$

becomes invalid. Here we have a single unit of time being used to produce joint products, and if both activities are considered separately then we increase the total time spent on the activities involved and the right-hand-side of our equation will exceed the given time constraint

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8/ The reverse may also be true. The marginal utility of the last unit of market production may be so high relative to the first unit of home production time that the latter is zero.

T_j. The theory in its present form is not able to deal with these problems of joint activities.

In my earlier study of ten rural households (1976), we found that joint production was a common occurence among the mothers involved in the survey. However, in all cases, the two or more activities done simultaneously could clearly be differentiated into one primary activity -- that activity to which the mother was giving more conscious attention -- and one or more secondary activities. The secondary activity most frequently involved a passive leisure activity such as listening to the radio, smoking or chatting, or a passive productive activity such as keeping an eye on a sleeping or playing child, on a pot of cooking rice, or on a sari-sari store. Thus if we choose to ignore secondary activities and count in only primary activities, our time constraint will still hold at the loss of only minor time inputs.

Assuming that an individual can "do only one thing at a time", i.e., can perform only one single primary activity at any one time, we can carry this rule on to the analysis of joint activities of other household members and keep our original time constraint.

3. On the Survey

3.1 Description of the Data Base and Definitions Used

The data set used in this study is the result of a survey of 573 households in the province of Laguna conducted over the period April 1975 to January 1976. It is a comprehensive collection of household data covering numerous aspects of the socio-economic status of the household, including detailed income, expenditure, and demographic data as well as some time and health and nutrition information. Aside from providing a rich source of cross-section household data, this data set also serves as a base for an intensive longitudinal study of some 80 households selected from the larger sample. Although the intensive phase of the project involves the collection of additional time data, only time data from the cross-section are discussed in this paper.

The households in the survey were selected from 34 barrios in Laguna which represented four main types of occupational groupings, depending on the dominant means of livelihood in the particular barrio. These four types and their representation in the sample were: (1) intensive

rice farming, 12 barrios; (2) farming of other crops, 13 barrios; (3) fishing, 3 barrios; and (4) semi-urban barrios with a wage labor/factory orientation, 6 barrios.

Table 1 shows the distribution of the 573 households in the sample according to the type of barrio to which they belong. The largest representation comes from the other crop and rice barrios (36.5 and 35.6 percent of the sample, respectively). Next are the industrial barrios (15.9 percent) and then the fishing barrios (12.0 percent). Obviously, a household located in one particular type of barrio does not necessarily derive income from the specified income source.

TABLE 1

NUMBER AND DISTRIBUTION OF HOUSEHOLDS BY TYPE OF BARRIO

TYPE OF BARRIO	NUMBER	PERCENT
Rice	204	35.6
Other Crops	209	36.5
Fishing	69	12.0
Industrial	91	15.9
	573	100.0

The most important groups of data used in the present study are the demographic data, the time and the related employment data. Each of these groups of data need some amount of clarification.

All demographic data are based on the presence of the household member in the household for at least one day during the survey week.[9/] Family members not actually living at home could influence the income and expenditure patterns of the household as well as the labor force status of the mother and other household members. However, since our main concern is the allocation of the mother's time as a component of the household's total available time resources, actual presence in the household seems to have the more direct bearing than other less direct contact with the household.

The time data available from the cross-section phase of the survey includes time spent on home production activities and on market production activities. The latter group includes activities done at home but the produce of which are sold for profit (e.g., weaving, food preservation,

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[9/] From here on the term survey week will be used to refer to the week preceding the day the household was surveyed.

etc.). Home gardening and livestock and poultry raising were considered market production activities only if the household received cash income[10] from them over the past year. Otherwise, we assumed that they were done exclusively for home consumption and were classified as home production activities.[11]

For purposes of studying the welfare effects of home production activities, we subclassify home production into child care (further subdivided into care of infants and care of pre-school children), food preparation (subdivided into marketing and cooking/serving of food), and other household activities (such as cleaning house, fetching water, etc).

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[10] Cash income here may be negative as in the case of livestock raising where cash expenses are incurred over the year but no sale has been made.

[11] One may argue to the contrary that since the family has the option to sell output from these activities then they should be considered market activities. Our definition, however, is consistent with that used by the NCSO in its Labor Force Survey and is therefore more familiar to policy makers. See page 6 of "Instruction on How to Fill the Household Schedule (BCSSH Form No. 2) on Labor Force, Survey of Household (Condensed)," mimeographed, available from the NCSO.

No time data is available on the consumption activities of the mother. Some information on consumption-time can be deduced, however, by taking a total for production time (home plus market production) and assuming an inverse relationship between consumption and production times. As we explain below, this relationship may not be a simple linear (residual) relationship if joint activities are undertaken.

The time data was collected with the use the recall method. The respondent was presented with a list of activities and was asked how much time each household member spent on each activity during the past week and, in the case of certain income earning activities, during the past month. One obvious weakness of the method is its susceptibility to memory lapses or a lack of time-consciousness on the part of the respondent. A second and important weakness is its inability to identify joint activities, i.e., two or more activities done simultaneously. For instance, a mother who is cleaning the house may be keeping an eye on her child at the same time so that if this is done for one hour then this would register a total of two productive hours, one for cleaning and one for child care. There is

no way that such an occurence can be positively identified from our data and hence no way to distinguish primary from secondary activities.[12/]

The reference period for all time data is the survey week, which covers a total of 168 hours. Assuming a normal sleeping pattern of 8 hours a day plus a minimum of 2 hours daily for recreation and personal activities, one would expect most mothers to have total working hours--i.e., home plus market production hours--of not more than 14 hours a day or 98 hours a week. However, we found a sizeable group of mothers having total production hours greater than this and, in a few cases, even greater than 168. To a large extent, this can be attributed to the occurrence of joint activities, particularly involving child care. However, there was also an apparent tendency for mothers to report extended hours spent daily on activities like child care,

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12/ This problem is dealt with in the intensive phase of this project where time data is collected by an observer actually present in the home and provides for a distinction between the main activity and any joint activity being performed. A similar breakdown is presented in my earlier (1976) paper.

preparing food, or minding a sari-sari store (e.g., a few mothers reported 8 hours daily on child care) where these activities were probably interspersed with other activities and not actually done cotinuously.

Finally, work status was determined by the hours spent in market production. If a mother spent zero hours at market production then she was not working; otherwise, she was working. Hence the term "work" is used here to refer to market production in particular and corresponds to the term "employment" used in most economic literature.

3.2 Some Characteristics of the Sample

3.2.1 Household Composition and Income

Of the 573 households in the sample, 8.2 percent had the father absent from the home all throughout the week and 3.3 percent had the mother absent. The average number of children per household was 3.5 with 9 percent of the households having no children at all and with one household having as many as 11 children. Table 2 shows the distribution of households by the number of children present in the household.

TABLE 2

DISTRIBUTION OF HOUSEHOLDS BY NUMBER OF OF CHILDREN

NUMBER OF CHILDREN	PERCENT
0	9
1	14
2	14
3	17
4	15
5	9
6	9
7	7
8	5
9	1
10	a/
11	a/

a/ Less than 0.5%

In Table 3 we show the distributions of households by the presence of young children less than 1, 4 and 7 years old. These are the ages at which children are expected to require special care, but in decreasing degrees. Among the households, 16 per cent had an infant between 0 and 11 months old, a total of 42 percent had at least one child 3 years old or below, and 58 percent had at least one child 6 years old or below. Thus, in the 84 percent of the households where there were no infants, the mother was free from the time intensive task of infant-care and in the 42 percent where there were no pre-school children, she probably did little or no child care activities at all.

TABLE 3

DISTRIBUTION OF HOUSEHOLDS BY NUMBER OF YOUNG CHILDREN PRESENT

No. of Children in Age Group	AGE GROUP		
	0-11 months	0-3 years	0-6 years
	%	%	%
0	84	57	42
1	16	27	22
2		14	19
3		1	13
4			3
5			1
	100	100	100

Another group of children that will be of interest to us is that group 10 years old and above. By the age of 10, children are usually expected to contribute some amount of productive time either at home or in the market. This, in turn, should lessen the productive hours of the mother. In Table 4 we show the distribution of households according to the number of children 10 years old and above. Here we see that only 38 percent of the households had no child in this age bracket and that the largest number of children in this age bracket was 9. The same table also gives this distribution by sex of the children.

TABLE 4

DISTRIBUTION OF HOUSEHOLDS BY NUMBER OF CHILDREN TEN YEARS OLD AND ABOVE, BY SEX

No. of Children 10 years & above	Both sexes	Males	Females
	%	%	%
0	38	50	51
1	13	21	25
2	15	16	13
3	11	8	7
4	10	4	3
5	7	1	1
6	3		a/
7	2	a/	
8	1		
9	a/		
	100	100	100

a/ Less than 0.5%

The highest annual net income reported for any household in the sample was 88,298 pesos and the lowest was -4,073. Table 5 shows the decile levels of income among the households surveyed. The table shows that the poorest 20 percent of the households had net income of 1181 pesos or less and the poorest 50 percent had incomes 3182 pesos or less. Less than 20 percent of the households had incomes of 10,000 pesos or more.

TABLE 5

DECILE LEVELS OF ANNUAL NET INCOME OF SAMPLE HOUSEHOLDS

PERCENTILE	NET INCOME
10	696
20	1181
30	1662
40	2259
50	3182
60	4255
70	5674
80	8713
90	12899
100	88298

3.2.2 Characteristics of the Mothers

The mean age of the mothers in the sample is 32.3 years with a standard deviation of 7.6. 91.5 percent of them had some amount of schooling but only 13.3 percent reached high school and only 1.7 percent graduated from college (Table 6). 34.7 percent of the mothers in the sample worked during the survey week and 65.3 percent did not work during said week.

TABLE 6

DISTRIBUTION OF MOTHERS BY EDUCATIONAL ATTAINMENT

EDUCATIONAL ATTAINMENT	%
No Schooling	8.5
Primary Undergraduate	24.3
Primary Graduate	18.8
Intermediate Undergraduate	11.8
Intermediate Graduate	23.3
Secondary Undergraduate	6.6
Secondary Graduate	4.0
College Undergraduate	1.0
College Graduate	1.7
	100.0

From Table 7, we see that the industrial barrios had the largest group of non-working mothers, where 71.4 percent were not working.

TABLE 7

PERCENT OF MOTHERS WORKING AND NOT WORKING, BY TYPE OF BARRIO

TYPE OF BARRIO	WORKING %	NOT WORKING %
All Mothers	34.7	65.3
Rice	36.8	63.2
Other Crops	35.4	64.6
Fishing	34.8	65.2
Industrial	28.6	71.4

The most predominant occupation (Table 8) reported among the mothers was weaving (mainly of mats and hats) which was done by 8.9 percent of the mothers. Farming and hired farm labor combined accounted for 9.5 percent while "buy and sell" enterprises covered 8.0 percent. A total of 59.9 percent of the mothers reported having no occupation. This group is smaller than the group of non-working women because it does not include those women who had some form of occupation but did not work during the survey week for some reason or another.

Table 9 relates the various occupations reported by the mothers to their place of work. Note that among the mothers who reported occupations, the largest group works at home or at an adjacent farm. We expect, of course, that mothers working at home or close to home are better able to schedule their time for efficient home and market production. Note, for example, that weaving, which is the most popular occupation among the mothers, is almost always done at home (84.3 percent of the time) and is therefore easily compatible with housework.

TABLE 8

DISTRIBUTION OF MOTHERS BY MAIN OCCUPATION

OCCUPATION	%
No Occupation	59.9*
Farming	3.1
Hired Farm Labor	6.4
Laundry Woman	1.6
Buy and Sell	8.0
Sari-sari Storekeeper	4.7
Teacher	1.4
Garments Making	1.9
Weaving	8.9
Others	4.2
	100.0

*This excludes women who did not work during the survey week for some reason or another but who reported some form of occupation.

TABLE 9

DISTRIBUTION OF MOTHERS BY PLACE OF WORK OF MAIN OCCUPATION, BY OCCUPATION

OCCUPATION	PLACE OF WORK		
	Home or Adjacent Farm	Same Barrio	Others
	%	%	%
All mothers with occupations	41.7	38.6	19.7
Farming	5.6	88.9	5.6
Hired Farm Labor	0.0	94.6	5.4
Laundry Woman	22.2	55.6	22.2
Buy and Sell	21.7	32.6	45.7
Sari-sari Storekeeper	100.0	0.0	0.0
Teacher	0.0	62.5	37.5
Garments Making	63.6	18.2	18.2
Weaving	84.3	7.8	7.8
Others	20.8	25.0	54.2

4. Survey Results

The mothers in our sample spent an average of 68.6 hours a week on productive activities or roughly 10 hours a day on home and market work combined. Of these, 12.6 hours were spent weekly on market production and 56.1 hours on home production (Table 10). Hence market production accounts for only 18.4 per cent of the total productive time of married women and, assuming the equivalence of marginal productivities per unit of time, only 18.4 per cent of their true productivity. Thus the first notable observation we can make is that reports on the economic productivity of women based on market production alone drastically understate the true contribution mothers make to household welfare. A more accurate account of female participation in economic activity would multiply existing man-hour statistics for women five-fold.

Among the home production activities, food production was most predominant, averaging 22.5 hours or almost one-third of total productive hours of the mothers. Of the 573 mothers in the sample, only 15 spent no time at all on food preparation throughout the survey week. In contrast, 38 mothers spent zero hours on all other home production activities combined (laundry, cleaning house,

TABLE 10

AVERAGE TIME SPENT ON EACH MAJOR ACTIVITY DURING THE SURVEY WEEK: ALL MOTHERS

ACTIVITY	All Mothers	
	Hours	%
A. Home Production	56.1	81.8
A.1 Child Care	9.8	14.3
A.1.1 Care of Infants	6.5	9.5
A.1.2 Care of Pre-Schoolers	3.3	4.8
A.2 Food Preparation	22.5	32.8
A.2.1 Marketing	3.6	5.2
A.2.2 Cooking and Serving Food	18.9	27.6
A.3 Other Home Production	23.8	34.7
B. Market Production	12.6	18.4
Total Production Time (A+B)	68.6	100.0
Number of Cases	573	

etc.) and 289 mothers registered zero totals for child care time.

On the average, mothers spent 99.4 hours weekly or over 14 hours daily on consumption (leisure) activities.

4.1 Effects of Family Size and Composition on the Time Allocation of the Mother

In general, the presence of children in the family affects household productive activities in two opposing ways. First, children consume welfare goods, and hence affect the needs of the family altering the form of the household utility function; this means a greater demand for welfare goods and a consequent increase in required productive inputs either in the form of time or goods inputs, or both. Second, as soon as they are old enough to contribute productive time, children comprise additions to household time resources which may be applied either at home or in the market.[13/] It is obvious that what is

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[13/] There are two other aspects to the role of children in the household economy: (1) children serve as consumption goods inasmuch as they provide pleasure to their parents, raising their parents' level of utility; and (2) children serve as investment goods, and are expected to yield returns in the form of future service to their parents or to the rest of the family. These points, though, are not directly relevant to the above discussion except in the implied assumption that a decision to let a child spend productive time at home or in the market at the expense of schooling means a sacrifice of future for present utility.

involved here is not only the number of children but, more important, the age structure of the children. Younger children are likely to call for high levels of inputs required for child rearing and nutriture and cannot be expected to contribute productive time. As the children grow older, however, inputs into raising children may increase (especially if they continue into higher levels of schooling) but they can also be expected to participate to some extent in household productive activities. Finally, if any differentiation exists in family attitudes towards sons and daughters then the sex of the child may affect the amount of human capital invested in the child as well as the amount of time he or she spends on home or market production. In terms of their effect on the mother's time budget, therefore, children may cause either an increase or a decrease in the mother's productive time at home and/or in the market.

Our survey results showed that when at least one young child (aged 0-6 years) was present in the family, the mother spent 78 hours a week on productive activities, almost 10 hours longer than the over-all average and about 22 hours longer than the average mother without a young child (Table 11). This difference in the time budgets of

mothers with and without young children was due mainly to the 16.7 hours spent on child care by mothers with children. However, these same mothers spent longer hours on food preparation and other home production activities too, implying that a young child's effect on the mother's time comes not only directly through child care time but also indirectly through more time spent on such activities as preparing food, cleaning house, laundering clothes, etc.

Although the presence of a young child caused the mother's market production time to decline as expected, this decline is slight and is only 3.3 hours weekly or less than one half hour a day.

Table II also shows the time budgets of 90 mothers who had children less than one year old. This group had almost the same average productive hours as the bigger group just discussed (mothers with children 0-6 years) However, they spent longer hours on home production, which occupied 92.1 per cent of their total productive hours, with less time spent on market production. Comparing this group of mothers with those without any children aged 0-6 years (first column in Table 11), we note an increase of 30.9 hours

in home production time and a significant decline of 8.3 hours in market production time.

To test the extent to which children provide substitute labor to the mother's production time, we next studied the group of mothers with children ten years old and above. As the number of children in this age group increases, we can expect to find a corresponding decline in the mother's home production time for two reasons; first, the larger the number of older children, the smaller the chances of there being younger children needing child care and other home production time, and second, the greater the amount of substitute labor available. We cannot make the same clear-cut predictions on market production time because whereas the mother's market time may tend to increase when younger children are not present, it could also decrease if the elder children are able to contribute to family cash income by undertaking some amount of market production themselves. These expectations were borne out by our results as shown in Table 12. As the number of children ten years and above increased, the mother's home production time declined considerably. When an elder child was present in the family, mother's time on child care went down by

5 to 6 hours a week. Curiously, time spent on other home production activities rose slightly when one or two elder children were present but went down by 8 hours when a third or more were around. A possible explanation for this could be that most families probably could not afford to send more than one (if any at all) child to high school and therefore kept the rest of the high-school-aged children at home.

There was no fixed pattern shown for changes in market production time but total production time did decline too.

Of the mothers with no children ten years old and above, 75 per cent had at least one child 0-6 years old. This proportion goes down to 56 per cent for mothers with 1-2 children in this higher age bracket and then further down to 39 per cent for those with 3 or more. Hence the reduction in the mother's working hours as the number of elder children increased could be due, in part, to the corresponding decrease in the number of younger children. Since our real concern was the substitutability of children's time for mother's time, we subclassified this group of mothers into those with childre 0-6 years and those

without. Table 13 shows that in households where there were younger children present, elder children did substitute for mother's time particularly in child care tasks. This substitution could not occur in households without younger children. Hence the pattern of decreasing production time for mothers as the number of elder children increases was no longer present when there were no younger children in the family. For both groups, however, there still was a decline in mother's time spent on other home production activities when there were 3 or more children 10 years old and above but the difference was less marked for the second group.

To try to trace any differences that might occur due to differences in sex of the elder children, we studied changes that occured in the mother's time budgets when male children 10 years and above were present and when they were not and compared these to similar changes that occured when females were present and when they were not. Columns 5 and 6 of Table 14 show these changes which appear to be quite similar for each of the individual activities. The greatest variations seem to lie in other home production activities where mother's time declined more,

and in market production where mother's time increased more when elder female children were present. This latter observation is not easy to explain.

The next two tables show time budgets of mothers for different family sizes. When all mothers were taken together (Table 15) there seemed to be apparent increase in the mother's home production time as family size increased accompanied by a decrease in market time. This pattern did not repeat itself, however, when the mothers were subgrouped according to the presence of children 0-6 years old (Table 16). When young children were present, total home production time was almost equal for all three groups of households and very slight (and irregular) variation occured for market production. When no young children were present, no fixed pattern appeared for any of the major activity groups.

The last four tables discussed point to the fact that variations in mothers' time budgets are more strongly influenced by the age structure of the household than by either the sex structure or total family size.

TABLE 11

AVERAGE TIME SPENT ON EACH MAJOR ACTIVITY DURING THE SURVEY WEEK: BY NUMBER OF YOUNG CHILDREN PRESENT

ACTIVITY	NUMBER OF CHILDREN 0-6 YEARS				NUMBER OF CHILDREN 0-11 MONTHS			
	No Child 0-6 Years		With Child 0-6 Years		No Child 0-11 Months		With Child 0-11 Months	
	Hours	%	Hours	%	Hours	%	Hours	%
A. Home Production	41.3	74.0	66.8	85.6	53.1	79.6	72.2	92.1
A.1 Child Care	0.0	0.0	16.7	21.4	7.3	10.9	23.0	29.3
A.1.1 Care of Infants	0.0	0.0	11.0	14.1	4.4	6.6	17.3	22.1
A.1.2 Care of Pre-Schoolers	0.0	0.0	5.7	7.3	2.9	4.3	5.7	7.2
A.2 Food Preparation	19.9	35.7	24.4	31.3	22.4	33.6	22.6	28.8
A.2.1 Marketing	4.0	7.2	3.3	4.2	3.7	5.5	3.0	3.8
A.2.2 Cooking and Serving Food	15.9	28.5	21.1	27.1	18.7	28.0	19.6	25.0
A.3 Other Home Production Activities	21.2	38.0	25.7	32.9	23.3	34.9	26.7	34.0
B. Market Production	14.5	26.0	11.2	14.4	13.8	20.7	6.2	7.9
Total Production Time (A&B)	55.8	100.0	78.0	100.0	66.7	100.0	78.4	100.0
Number of Cases	243		330		483		90	

TABLE 12

AVERAGE TIME SPENT ON EACH MAJOR ACTIVITY DURING THE SURVEY WEEK: BY NUMBER OF CHILDREN 10 YEARS AND ABOVE

ACTIVITY	NUMBER OF CHILDREN AGED 10 YEARS AND ABOVE					
	0		1-2		3+	
	Hours	%	Hours	%	Hours	%
A. Home Production	63.3	84.4	57.7	80.0	46.3	79.5
A.1 Child Care	15.8	21.1	6.6	9.2	5.5	9.5
A.1.1 Care of Infants	10.8	14.4	4.4	6.1	3.3	5.7
A.1.2 Care of Schoolers	5.0	6.7	2.4	3.2	2.2	3.8
A.2 Food Preparation	22.6	30.1	23.6	32.7	21.4	36.8
A.2.1 Marketing	2.8	3.7	4.3	5.9	3.9	6.8
A.2.2 Cooking & Serving Food	19.8	26.4	19.3	26.8	17.4	28.9
A.3 Other Home Production Activities	25.0	33.3	27.5	38.1	19.4	33.3
B. Market Production	11.6	15.5	14.7	20.0	12.0	20.6
Total Production (A&B)	75.0	100.0	72.1	100.0	58.2	100.0
Number of Cases	218		164		191	

TABLE 13

AVERAGE TIME SPENT ON EACH MAJOR ACTIVITY DURING THE SURVEY WEEK:
BY NUMBER OF CHILDREN 10 YEARS AND ABOVE AND BY PRESENCE OF YOUNG CHILDREN

ACTIVITY	MOTHERS WITH CHILDREN 0-6 YEARS						MOTHERS WITHOUT CHILDREN 0-6 YEARS					
	NUMBER OF CHILDREN AGED 10 YRS AND ABOVE						NUMBER OF CHILDREN AGED 10 YRS AND ABOVE					
	0		1-2		3+		0		1-2		3+	
	Hours	%	Hours	%	Hours	%	Hours	%	Hours	%	Hours	%
A. Home Production	71.4	87.2	67.1	83.9	56.2	84.3	39.3	72.0	45.7	72.9	39.9	75.7
A.1 Child Care	21.0	25.6	11.9	14.9	13.1	19.6	0.0	0.0	0.0	0.0	0.0	0.0
A.1.1 Care of Infants	14.4	17.6	7.7	9.6	7.7	11.5	0.0	0.0	0.0	0.0	0.0	0.0
A.1.2 Care of Pre-Schoolers	6.6	8.1	4.2	5.2	5.4	8.1	0.0	0.0	0.0	0.0	0.0	0.0
A.2 Food Preparation	24.1	29.4	25.5	31.9	23.6	35.4	18.2	33.3	21.2	33.8	20.0	38.0
A.2.1 Marketing	2.6	3.2	4.3	5.4	3.5	5.2	3.4	6.2	4.3	6.9	4.2	8.0
A.2.s Cooking and Serving Food	21.5	26.3	21.2	26.5	20.1	30.1	14.8	26.1	16.9	27.0	15.7	30.0
A.3 Other Home Production Activities	26.3	32.1	29.7	37.1	19.5	29.2	21.1	38.6	24.7	39.4	19.3	36.6
B. Market Production	10.5	12.8	12.9	16.1	10.5	15.7	14.9	27.3	17.0	27.1	13.0	24.7
Total Production (A&B)	81.9	100.0	80.0	100.0	66.7	100.0	54.6	100.0	62.7	100.0	52.7	100.0
Number of Cases	163		92		75		55		72		116	

TABLE 14

AVERAGE TIME SPENT ON EACH MAJOR ACTIVITY DURING THE SURVEY WEEK: BY NUMBER OF CHILDREN 10 YEARS AND ABOVE AND BY SEX OF THE CHILDREN

ACTIVITY	NUMBER OF CHILDREN 10 YEARS AND ABOVE								TIME DIFFERENTIALS	
	MALES				FEMALES				MALES	FEMALES
	NONE (1)		ONE OR MORE (2)		NONE (3)		ONE OR MORE (4)		(2)-(1)	(4)-(3)
	Hours	%	Hours	%	Hours	%	Hours	%	Hours	Hours
A. Home Production	61.2	83.2	50.9	80.2	61.3	84.6	50.5	78.4	-10.3	-10.8
A.1 Child Care	13.5	18.3	6.0	9.4	12.7	17.5	6.6	10.2	- 7.5	- 6.1
A.1.1 Care of Infants	9.3	12.6	3.7	5.8	8.7	12.0	4.1	6.4	- 5.6	- 4.6
A.1.2 Care of Pre-Schoolers	4.3	5.8	2.3	3.6	4.0	5.5	2.5	3.9	- 2.0	- 1.5
A.2 Food Preparation	23.3	3.2	21.6	34.0	22.6	31.2	20.1	31.2	- 1.7	- 2.5
A.2.1 Marketing	3.4	4.6	3.8	6.0	2.9	4.0	4.4	6.8	0.4	1.5
A.2.2 Cooking and Serving Food	19.9	27.0	17.8	28.0	19.7	27.2	18.0	28.0	- 2.1	- 1.7
A.3 Other Home Production Activities	24.4	33.2	23.3	36.7	26.0	35.9	21.5	33.4	- 1.1	- 4.5
B. Market Production	12.4	16.8	12.9	20.3	11.2	15.4	14.2	22.0	0.5	3.0
Total Production (A+B)	73.6	100.0	63.5	100.0	72.5	100.0	64.4	100.0	-10.1	- 8.1
Number of Cases	286		287		295		278			

TABLE 15

AVERAGE TIME SPENT ON EACH MAJOR ACTIVITY DURING THE SURVEY WEEK: BY NUMBER OF CHILDREN PRESENT

ACTIVITY	NUMBER OF CHILDREN					
	0-2		3-5		6+	
	Hours	%	Hours	%	Hours	%
A. Home Production	53.1	79.8	56.1	81.8	60.9	84.3
A.1 Child Care	9.2	13.8	8.7	12.7	12.8	17.7
A.1.1 Care of Infants	6.2	9.3	5.8	8.5	8.3	11.5
A.1.2 Care of Pre-Schoolers	3.0	4.5	2.9	4.2	4.5	6.2
A.2 Food Preparation	20.9	31.4	22.1	32.3	25.7	35.6
A.2.1 Marketing	3.4	5.1	3.4	5.0	4.4	6.1
A.2.2 Cooking and Serving Food	17.6	26.5	18.7	27.3	21.3	29.5
A.3 Other Home Production	23.1	34.7	25.3	36.9	22.4	31.0
B. Market Production	13.4	20.2	12.6	18.3	11.3	15.7
Total Production (A&B)	66.5	100.0	68.5	100.0	72.2	100.0
Number of Cases	211		237		125	

TABLE 16

AVERAGE TIME SPENT ON EACH MAJOR ACTIVITY DURING THE SURVEY WEEK
BY NUMBER OF CHILDREN AND BY PRESENCE OF YOUNG CHILDREN

ACTIVITY	MOTHERS WITH CHILDREN 0-6 YEARS						MOTHERS WITHOUT CHILDREN 0-6 YEARS					
	NUMBER OF CHILDREN						NUMBER OF CHILDREN					
	0-2		3-5		6+		0-2		3-5		6+	
	Hours	%	Hours	%	Hours	%	Hours	%	Hours	%	Hours	%
A. Home Production	66.9	87.6	66.8	84.7	66.4	85.3	42.0	71.8	39.2	66.3	46.2	80.8
A.1 Child Care	20.2	26.4	14.2	18.0	16.9	21.7	0.0	0.0	0.0	0.0	0.0	0.0
A.1.1 Care of Infants	13.6	17.8	9.4	11.9	10.8	13.9	0.0	0.0	0.0	0.0	0.0	0.0
A.1.2 Care of Pre-Schoolers	6.6	8.6	4.8	6.1	6.1	7.8	0.0	0.0	0.0	0.0	0.0	0.0
A.2 Food Preparation	22.0	28.8	24.3	30.8	26.9	34.6	20.0	34.2	18.6	31.5	22.5	39.3
A.2.1 Marketing	2.6	3.4	3.1	3.9	4.2	5.4	4.0	6.8	3.9	6.6	4.9	8.6
A.2.2 Cooking and Serving Food	19.4	25.4	21.2	26.9	22.7	29.2	16.2	27.7	14.8	25.0	17.5	30.6
A.3 Other Home Production	24.7	32.3	28.3	35.9	22.6	29.0	21.8	37.3	20.6	35.0	21.9	38.3
B. Market Production	9.5	12.4	12.1	15.3	11.4	14.7	16.5	28.2	19.9	33.7	11.0	19.2
Total Production (A&B)	76.4	100.0	78.9	100.0	77.8	100.0	58.5	100.0	59.1	100.0	57.2	100.0
Number of Cases	94		145		91		117		92		34	

4.2 Effects of Employment on the Time Allocation of the Mother

The next point of concern in our study is the variation in mothers' time budgets that resulted from their employment in the market. An interesting pattern emerges when we compare the time budgets of women who were working with those of women who were not working (Table 17). While employed mothers worked an average of 89.1 hours a week, mothers who were not employed worked only 57.7 hours, exclusively on home production. The additional 36.4 hours of market work of employed women was not compensated by an equivalent or even nearly equivalent reduction in home production hours: working mothers spent only 4.7 hours less, weekly, on home production than non-working mothers.

It seems evident that, on the average, mothers look on market production opportunities as supplements to rather than substitutes for home production. The implication here is that the marginal productivities of the first units of home production time exceed that of the first unit of market production time of the average mother. (From our observations, this refers to the first 50 or so hours of home production). It would be interesting to find out whether the same conclusions would hold for a different group, say

of mothers in urban households, where income levels, educational backgrounds, and employment opportunities may differ. Casual observation of mothers of higher educational attainment who work in the market but do hardly any home production hint at an entirely different situation.

Among working mothers, further variations in time budgets existed as the mother's place of work changed (Table 18). Mothers working away from home spent slightly less time on home production than mothers whose market employment was performed, physically, at home. This was particularly true for food preparation on which mothers working at home spent an average of 3 hours more per week than those who worked outside the home in the same barrio, and an average of 5 hours more than those who worked outside the barrio. These differences, though slight, could have some bearing on the quality of food preparation that the mother was able to accomplish.

More obvious differences exist among the market production hours of these three groups of mothers. The farther away the mother's place of work from home, the longer the hours spent, on the average, on market production. (Our figures for market time do not include travel time). It

seems logical that anyone working a long distance from home would have to work long enough at that job to compensate for time and money expenses on travel.

Our final table was set up to observe changes in time budgets of mothers as they varied their hours of work in the market (Table 19). A curious pattern emerges in this table for the home production time of mothers in the three categories. Hours of home production are almost equal for mothers who worked in the market less than 20 hours and those who worked more than 40 hours, but are significantly lower for those mothers who worked in the market 20 to 40 hours. There does not seem to be any logical explanation for this occurence and it seems best to hold any analysis and hope that further evidence will eventually clarify the matter.

TABLE 17

AVERAGE TIME SPENT ON EACH MAJOR ACTIVITY DURING THE SURVEY WEEK: BY WORK STATUS

ACTIVITY	WORK STATUS			
	Working		Non-Working	
	Hours	%	Hours	%
A. Home Production	53.0	59.5	57.7	100.0
A.1 Child Care	7.5	8.4	11.0	19.1
A.1.1 Care of Infants	4.7	5.3	7.4	12.8
A.1.2 Care of Pre-Schoolers	2.8	3.1	3.6	6.2
A.2 Food Preparation	22.8	25.6	22.3	38.6
A.2.1 Marketing	4.1	4.6	3.4	5.9
A.2.2 Cooking and Serving Food	18.7	21.0	19.0	32.9
A.3 Other Home Production	22.7	25.5	24.4	42.3
B. Market Production	36.4	40.9	0.0	0.0
Total Production (A&B)	89.1	100.0	57.7	100.0
Number of Cases	199		374	

TABLE 18

AVERAGE TIME SPENT ON EACH MAJOR ACTIVITY DURING SURVEY WEEK: BY PLACE OF WORK OF MAIN OCCUPATION[a/]

ACTIVITY	PLACE OF WORK OF MAIN OCCUPATION					
	Home or Adjacent Farm		Same Barrio		Others	
	Hours	%	Hours	%	Hours	
A. Home Production	56.7	71.2	50.8	63.5	52.6	6
A.1 Child Care	9.8	12.1	7.6	9.5	8.8	1
A.1.1 Care of Infants	7.0	8.6	4.8	5.3	4.3	
A.1.2 Care of Pre-Schoolers	2.8	3.5	2.8	3.5	4.5	
A.2 Food Preparation	24.9	30.7	21.9	27.3	19.9	2
A.2.1 Marketing	4.2	5.2	3.3	4.1	3.6	
A.2.2 Cooking & Serving Food	20.6	25.4	18.6	23.3	16.3	1
A.3 Other Home Production	22.2	27.4	21.3	23.3	16.3	1
B. Market Production	24.6	30.4	29.4	36.8	33.6	3
Total Production Time (A&B)	81.0	100.0	80.0	100.0	86.2	10
Number of Cases	94		88		45	

[a/] Includes all employed women plus 28 mothers who reported occupations but d not work during the survey week.

TABLE 19

AVERAGE TIME SPENT BY WORKING MOTHERS ON EACH MAJOR ACTIVITY DURING THE SURVEY WEEK BY HOURS OF EMPLOYMENT

ACTIVITY	HOURS OF EMPLOYMENT					
	20 Hours		20-40 Hours		40 Hours	
	Hours	%	Hours	%	Hours	%
A. Home Production	55.3	86.9	47.1	61.1	55.2	51.2
A.1 Child Care	7.0	11.0	7.7	10.0	7.7	7.1
A.1.1 Care of Infants	3.6	5.7	6.1	7.9	4.5	4.2
A.1.2 Care of Pre-Schoolers	3.4	5.3	1.7	2.2	3.2	3.0
A.2 Food Preparation	22.0	34.6	20.8	27.0	24.3	22.5
A.2.1 Marketing	3.4	5.3	3.5	4.5	4.7	4.4
A.2.2 Cooking & Serving Food	18.6	29.2	17.3	22.4	19.6	18.2
A.3 Other Home Production	26.3	41.4	18.6	24.1	23.2	21.5
B. Market Production	9.5	14.9	30.0	38.9	52.8	48.9
Total Production Time (A&B)	63.6	100.0	77.1	100.0	107.9	100.0
Number of Cases	47		54		98	

5. Summary of Findings

To summarize, we restate the following major findings of our study:

1. Mothers in the households surveyed spent an average of 70 hours a week (10 hours a day) on home and market production work combined and 98 hours (14 hours a day) on consumption. Of this total production time, only 18 per cent went to market production and 82 per cent to home production.

2. The presence of a young child (0-6 years old) in the family caused an increase not only in the mother's child care time but also in the time she spent on food preparation and on other home production activities. Market production decreased but only slightly. When a child 0-11 months was present however the increase in home production time and the decrease in market production time was more marked.

3. Elder children (10 years and above) provided substitute labor to the mother's home production time, particularly in the care of younger children and, to some extent, in other home production activities; they did not substitute for mother's food preparation activities. No evidence of sex differentials among elder children was observed.

4. The total number of children had no direct influence on the mother's time budget. Family composition rather than size proved to be the major determinant of the mother's time allocation.

5. Employment in the labor market (market production time greater than zero) did not reduce the mother's home production activities significantly; hence working spent an additional 36.4 hours weekly (5.2 hours daily) on productive activities than non-working mothers.

6. Mothers whose place of market employment was at home or close to home spent longer hours on home production, especially food preparation, and shorter hours on market production.

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