3.0 THE DIVISION OF LABOUR IN MARRIAGE

We have seen how common preference models of the household explain decisions on consumption: decisions are made either by the head of the household alone, or by the household as a whole seeking to maximize a common utility function. Bargaining models on the other hand view consumption decisions as being made via a bargaining process, whether threat points are divorce or a non-cooperative marriage. From these theoretical underpinnings of household decisions in general, we turn to the specific decision of how housework is divided within a marriage.

Widely acknowledged as one of the pioneer researchers in the area of Family Economics is Becker, who proposes that gains to the household would be maximized if couples allocated their time based on comparative advantages (whether intrinsic, acquired through specialized investment or both).

While his specialization model fails to address issues of bargaining and intrahousehold disagreement, it nevertheless provides interesting, if not controversial insights into how an efficient household should approach the division of labour problem.

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3.1 Becker's (1989) Single-Member Household

Becker begins with a model of specialization in the household with intrinsically-identical members. He considers first a single-person household, in which two types of human capital exist: H^1 which raises market wage rates and H^2 which increases efficiency of performing household tasks (thereby increasing the effective amount of household time). He assumes that capital is accumulated in an initial investment period, after which the household uses a fixed amount of time to maintain such capital stocks, and then allocates time between the market and the household to maximize consumption. If $\hat{H}$ denotes optimal capital stock, then aggregate consumption can be thus written:

$$Z = Z(x, t_h') = Z\left[\frac{a\hat{H}^1}{p_x} t_w, \psi\hat{H}^2 t_h\right] \qquad 3.1$$

where $a\hat{H}^1$ is the wage rate, which is dependent on market human capital H^1, and $\psi\hat{H}^2 t_h$ is the effective amount of household time, which is dependent on household human capital H^2.

Thus we see that aggregate consumption is a function of the real wage and household time. The time constraint $t' = t_w + t_h$ is seen here to be the total time available each year after the investment period, and this residual time is spent partly in the market sector and partly in the household.

The allocation of time would be optimal if

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$$MP_{market\ time} = MP_{household\ time} \qquad 3.2$$

From equation [3.1], we can rewrite [3.2] as

$$\frac{\partial Z}{\partial t_w} = \frac{\partial Z}{\partial t_h}$$

$$\frac{\partial Z}{\partial x}\frac{a\hat{H}^1}{p_x} = \frac{\partial Z}{\partial t_h'}\psi\hat{H}^2 \qquad 3.3$$

3.2 The Multiple-Member, Gender Neutral Household

Becker then proceeds to extend this to a household with two or more members. In such a household, optimal decisions must take into account the individual skills of different members as well as conflicts in their incentives. The basic theory of comparative advantage stipulates that the most efficient outcome is achieved when resources of members are allocated to various activities according to their relative efficiencies.

Assuming for now that each household member is identical, then any difference in efficiency would be due not to biological or intrinsic differences between members, but due to differences in experience and different investments in human capital.

If all members were intrinsically identical, they would supply the same kind of time to the market sector and to the domestic sector; the effective time of different members would be perfect substitutes, as would be the goods supplied

by different members. Thus, output of the household would depend on the aggregate inputs of goods and effective time:-

$$Z = Z\left(\sum_{i=1}^{n} x_i, \sum_{i=1}^{n} t'_{h_i}\right)$$

$$Z = \left[\sum_{i=1}^{n} \frac{a\hat{H}_i^1}{p_x} t_{w_i}, \sum_{i=1}^{n} \psi \hat{H}_i^2 t_{h_i}\right] \qquad 3.4$$

This implies that if all members accumulated the same capital, then aggregate consumption would depend on aggregate hours supplied to each sector and **not** on the distribution of hours between members. However, if capital accumulated by each member is different, then aggregate consumption **would** depend on the distribution of hours to both sectors since the different capital stocks would make household (or market) time of some members more productive than other members.

As before, output would be maximum if $\mathrm{MP}_{\text{market time}} = \mathrm{MP}_{\text{household time}}$. From equation [3.4], this would mean

$$\frac{\partial Z}{\partial t_{w_j}} = \frac{\partial Z}{\partial t_{h_j}}$$

$$\frac{\partial Z}{\partial x_j} \frac{a\hat{H}^1{}_j}{p_x} = \frac{\partial Z}{\partial t'_{h_j}} \psi \hat{H}^2{}_j \qquad 3.5$$

when member j supplies time to both sectors ($t_{w_j}, t_{h_j} > 0$)

As such the marginal product of household time must exceed the marginal product of market time for any member who devotes all time to the household (and conversely for members devoting all time to the market).

The theory of comparative advantage uses the ratio of marginal products to define comparative advantage, comparing this ratio for one member against the same ratio for other members. For example, member i would have comparative advantage over member j in the market sector only if i's $\frac{MP_{markettime}}{MP_{householdtime}}$ ratio exceeds j's:-

$$\frac{\frac{\partial Z}{\partial t_{w_i}}}{\frac{\partial Z}{\partial t_{h_i}}} > \frac{\frac{\partial Z}{\partial t_{w_j}}}{\frac{\partial Z}{\partial t_{h_j}}}$$

$$\frac{\frac{\partial Z}{\partial x_i}\frac{a\hat{H}^1{}_i}{p_x}}{\frac{\partial Z}{\partial t'_{h_i}}\psi\hat{H}^2_i} > \frac{\frac{\partial Z}{\partial x_j}\frac{a\hat{H}^1{}_j}{p_x}}{\frac{\partial Z}{\partial t'_{h_j}}\psi\hat{H}^2_j} \qquad 3.6$$

Since a, p_x, $\frac{\partial Z}{\partial x}$ and $\frac{\partial Z}{\partial t'_h}$ are the same for all members, therefore comparative advantage depends only on the capital stocks of H^1, H^2 and the wage rate ψH^2.

Equation 3.6 can thus be simplified to

$$\frac{\hat{H}_i^1}{\psi\hat{H}_i^2} > \frac{\hat{H}_j^1}{\psi\hat{H}_j^2} \qquad 3.7$$

Hence, we see that member i would have comparative advantage in the market sector (over member j) if and only if

$$\frac{\hat{H}_i^1}{\hat{H}_j^1} > \frac{\psi\hat{H}_i^2}{\psi\hat{H}_j^2} \qquad 3.8$$

If all members of an efficient household had different comparative advantages, each member would specialize according to their comparative advantages, with members having a greater $\frac{MP_{marketime}}{MP_{householdtime}}$ ratio devoting all time to the market, and members having a weaker $\frac{MP_{marketime}}{MP_{householdtime}}$ ratio devoting all time to the household.

The capital accumulation patterns of these members would also follow suit. Members with a comparative advantage in market work would invest only in type H^1 capital, and members with a comparative advantage in household work would invest only in type H^2 capital. This is because returns on investment in any capital depend on how intensively that capital is used. Members with a comparative advantage in market work would specialize completely in market work and therefore have incentive to accumulate H^1 type capital. They would have no incentive to accumulate H^2 type capital (and conversely for members

with comparative advantage in the household sector). Thus, a sharp division of labour implies an equally sharp division in the accumulation of specific capital.

Becker notes that this is consistent with Smith's theorem that the division of labour is limited by the extent of the market. Greater activity in the market would lead to greater time spent in the market and subsequently greater accumulation of market-type capital (and vise versa).

Becker also proves that even when two (or more) members of an efficient household start off with marginal product ratios equal to one (no initial comparative advantage exists), both (or all) members would be made better off if members agreed on a division of labour (which may start off arbitrary) and proceeded to accumulate capital accordingly: the member who agrees to specialize in the market would accumulate only market capital, and the one who agrees to specialize in the household would accumulate only household capital. Effectively, such a household would, by their investment decisions, **create** comparative advantages between members, justifying their division of labour.

Becker also proves that when commodity production functions have constant or increasing returns to scale, all members of an efficient household would specialize completely in one sector or the other and would invest only in the type of capital that enhances his or her comparative advantage. Suppose one

member of an n-person household spends time in both sectors, accumulates both types of capital but devotes relatively more time to the market sector. Should two n-person households form a single 2n-person household, one member alone would be able to supply total time to the market equal to that supplied by him and his counterpart combined before the households merged. If they continue making the same investments, constant or increasing returns to scale in the commodity production function would imply an output of the combined household that would be **at least equal** to the sum of output of the smaller households.

In fact, the combined households would do better if members coordinated their investments, accumulating only capital which enhances their comparative advantage.

Becker notes that the concept of specialized capital need not be limited to the idea that each capital type improves efficiency at only one type of activity. The above theorems would still hold as long as a dollar spent on H^1 raises wage rates more than a dollar spent on H^2, and a dollar spent on H^2 improves efficiency at performing household tasks more than a dollar spent on H^1.

It is clear then that Becker sees the fundamental source of gains from specialization as the advantage of specialized investment, and not necessarily

intrinsic differences among household members which lead to initial comparative advantages. He draws parallels between his work and observations in modern trade theory which sees countries with similar factor endowments trading more with each other (for example Great Britain and Germany) than with countries with seemingly different intrinsic endowments (for example India and Japan).

Becker also uses the notion of specialized investment enhancing and improving comparative advantages to explain why trade does not diminish over time despite the apparent convergence of factor endowments among countries in the long run.

3.3 Gender and Specialization in the Multiple-Member Household

Becker (1993:37) explains the sharp division of labour in societies is also partly due to intrinsic differences between sexes. Women are seen to have biological commitments to the production of children, and Becker proposes that this creates an incentive for women to expend energy and time to childcare as doing so increases the returns to biological investments in production. He also sees a complementarity in the bearing and rearing or children, as mothers are more able to feed and watch older children when producing additional children than when engaging in market activity.

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Against this backdrop of biological differences between sexes, Becker analytically distinguishes gender differences using the assumption that an hour of household (or market) time of women is not a perfect substitute of an hour of the time of men when investments in human capital are made. Such gender differences may help explain the portion of sexual division of labour not attributable to specialized investment in human capital. If women do then have comparative advantage over men in domestic activities, then an efficient dual-sex household would allocate the time of women mainly to the household, and the time of men mainly to the market sector.

This biologically-induced comparative advantage difference enters the aggregate consumption function via the parameters α and β.

Recalling equation [3.4] for the multiple-member household

$$Z = Z\left[\sum_{i=1}^{n} \frac{a\hat{H}_i^1}{p_x} t_{w_i}, \sum_{i=1}^{n} \psi \hat{H}_i^2 t_{h_i}\right]$$

we can simplify the aggregate consumption function to highlight a gender-based (as opposed to investment-based) comparative advantage women have over men in the domestic sector. Let the wage rate $a\hat{H}^1$ be instead denoted by w

$$Z = Z\left[\sum_{i=1}^{n} \frac{w}{p_x} t_{w_i}, \sum_{i=1}^{n} t_{h_i}\right]$$

For a two-member, dual-sex household, this can be expanded to

$$Z = Z\left[\frac{w}{p_x}t_{w_m} + \frac{\alpha w t_{w_f}}{p_x}, t_{h_m} + \beta t_{h_f}\right]$$

where $\beta > \alpha$ since women are assumed to have comparative advantage in the household sector.

If the man allocates time to both sectors, then

$$\frac{\partial Z}{\partial x}\frac{w}{p} = \frac{\partial Z}{\partial t_h'}$$

But for the woman, who faces an inborn comparative advantage in the domestic sector, her marginal product in the household would exceed her marginal product in the market:

$$\alpha\frac{\partial Z}{\partial x}\frac{w}{p} < \beta\frac{\partial Z}{\partial t_h'} \qquad \text{where } \beta > \alpha$$

This reasoning suggests that single-sex households (even single-member households) would be less efficient than dual-sex households as they would be unable to enjoy gains from specialization according to gender-based comparative advantages.

3.4 Complementarity in the Time of Men and Women

We have seen how biologically induced comparative advantage differences affect the marginal products of men and women. We have also been introduced to the notion that women face a complementarity between child bearing and child rearing which further reinforces intrinsic comparative advantages. Investments in

specialized capital aside, Becker proposes that these biologically-based gender differences alone justify a gender-based division of labour in the household. Investment in specialized capital then serves to **enhance** any intrinsic comparative advantage that exists.

Clearly then, time allocation, a gender-based division of labour and a gender-based division in the accumulation of specialized investment would be sharper when the time of men and women are more substitutable (or less complementary).

An interesting extension of these arguments is Becker's idea that men and women do in fact also face a complementarity in time. Commodities such as children require joint production, and the time of men and women can be viewed as complements in sexual enjoyment. Companionship and romantic notions of home and family clearly also suggest time complementarity. The larger this complementarity factor, the weaker the expected division of labour. This could explain modern trends of more man-time spent in the home.

3.5 Empirical Support of the Gendered Division of Labour

If the gender-based comparative advantage outlined above does exist, we can expect a sharper division of labour in households with children than in childless households. In fact, Browning (1992) finds that in general, there is a strong

negative correlation between the presence of young children and a mother's labour supply. This appears consistent with Hayghe and Bianchi's (1994) findings that while spousal specialization persists in families with children, the labour supply behavior of men and women is **similar** for childless couples.

Although post-1970 more women have been observed to remain in employment despite having young children, Leibowitz & Klerman (1995) find that presence of young children still has a significant effect on mothers' labour supply.

Lundberg and Rose (1999) attempt to study the determinants of specialization within marriage, using a unitary model of the household in which spouses choose market goods, childcare arrangements and time use in order to jointly maximize a utility function that depends on consumption, leisure time of each spouse and the value of child services.

They find that the birth of a first child corresponds with a significant rise in the degree of specialization in the household, with annual earnings differentials rising more than the average earnings of wives, and total market hours spent by the household decreases 28% after the birth. Fixed-effect equations for individual hours and earnings show that a substantial portion of this difference is caused by a decrease in the wife's hours and earnings, although the market intensity and earnings of fathers in the sample did increase after birth.

Empirical studies thus do appear to suggest a gendered division of labour especially where biological factors (the presence of children) exist. However, Becker's application of comparative advantage theory to the family does not take into account the presence of divorce risk and how this may affect the behavioral decisions of husbands and wives.

A household that indulges in complete specialization based on intrinsic and investment-induced comparative advantages would face substantial losses should the marriage end in divorce. Wives in particular would find themselves with little or no market-type capital, thus greatly reducing any potential market-derived income post-divorce. Women facing divorce risk may therefore have a disincentive to specialize completely in home production (and invest only in household-type human capital), resulting in a less than complete division og labour within the household.

Lundberg and Rose were prompted to test for such behavioral differences, having noted that the sample in their study spanned the behaviour of married couples between 1968 and 1992, allowing for an observation of marriages for a window of up to 25 years. During this period, there were substantial changes in divorce laws, divorce rates and female labour market participation.

They proceeded to divide their sample into 2 groups: those with wives born 1950 or earlier (the older cohort) and those with wives born after 1950 (the younger cohort). Couples with wives from the younger cohort, who faced increased relative female wages, changed gender role norms and higher perceived divorce risks exhibited significantly smaller increases in specialization after the birth of the first child when compared with couples from the older cohort. Interestingly, household adjustments between the two cohorts were also significantly different. In the younger cohort, the husband's hours and earnings rose less after the birth of the child when compared with the hours and earnings growth of husbands in the older cohort.

This is echoed by Wells and Maher (1996) who find that the division of labour would be substantially weaker when husbands are not able to indemnify wives for future losses associated with specialization should the marriage end in divorce.

Lundberg and Rose (1999) also examined the relationship between divorce and specialization, showing that couples who divorced in the sample period displayed significantly smaller increases in specialization after childbearing. They propose that the fall in specialization is reflected in the responses of both spouses: men whose marriages did end in divorce displayed smaller increases in earnings and women in such marriages showed smaller decreases in work hours and earnings

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when compared with couples whose marriages remained intact during the sample period.

Interestingly, they found when interacting the effect of divorce against cohort, the weaker specialization behaviour of divorcing couples was significant only for the younger cohort. They speculate that with divorce rates rising in the late 1960's, couples from the younger cohort faced higher divorce risk and adjusted household behaviour accordingly.

There is therefore some support for the argument that households, in deciding on the division of paid and unpaid work, do incorporate bargaining elements in decision-making.

However, Lundberg and Rose note that while the data did suggest a relationship between divorce and specialization, the direction of causality could not be proven. Expectations of divorce could encourage less specialization, but it is also possible that less specialization resulted in lower marital surplus which increased the likelihood of divorce.

The models discussed so far tend to emphasize utility within the marriage, expected outcomes in the event of divorce and economic gains to specialization in explaining the gendered division of labour. Sociologists and feminists however,

point to other factors as determinants of division of labour patterns, and in so doing, present interesting criticisms of neoclassical marriage models. Some of these arguments are presented in Chapter 4.

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