



Research Article

MARRIAGE (IN) STABILITY IN A NUCLEAR FAMILY UNDER DIFFERENT CHILD CUSTODY REGIMES: A THEORETICAL ANALYSIS

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ABSTRACT

The paper models a *joint family* consisting of husband, wife, child and other family members of the husband. Both the parents derive satisfaction from well-being of their child and consumption of a private good. The well-being of child is a household pure public good which is provided by the voluntary contributions of *time* by the parents and other family members. Starting from a situation where, in spite of frequent parental conflict, each parent is indifferent between divorce and staying together, the paper shows that both parents strictly prefer divorce in *nuclear family* when wife has the sole custody of child in the post-divorce equilibrium. On the other hand, if husband has the sole custody then, although, he strictly prefers to stay together in nuclear set-up, wife's attitude towards divorce is ambiguous. Finally when both have joint physical custody then attitude of both towards divorce in nuclear family becomes ambiguous.

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INTRODUCTION

One essential calisthenics of modern society is the virtual and gradual disappearance of joint families and their transformation into nuclear families¹. Cohen (1981) remarked that there has been an incessant contraction in the household size for around ten thousand years and it is the evolving technology that had facilitated the regular household tasks which earlier used to exact a number of co-operating people. Even though, Indian society for a long time was characterized by the omnipresence of joint families both lineally and collaterally extended, it has been observed that over the years in India joint families have been gradually transmuting into nuclear families (Niranjan *et al* (1998)). Going back to the history, according to the 1981 census, the population growth was higher than the growth rate of households. The reversal of this incident took place in 1991 census where the growth of number of households superseded the population growth. This trend exhibited an enhanced momentum in 2001 census data. So it is legitimate to surmise that nuclear family is playing the pivotal role in determining the structure of the present day Indian society.

Now in the 20th century one of the marked demographic trends noticed is an increased rate of divorce (Pezzin and Barbara (1999)). As of 2014, Belgium has the highest divorce rate² of 70 per cent. Spain, Portugal, Luxembourg, the Czech Republic and Hungary are worse off with divorce rates higher than 60 per cent. While it is 53 per cent in the U.S., the lowest official rate is in Chile with 3 per cent. Even in India a significant increase in the rate of divorce has been observed (Thakur (2009)). The states like Punjab and Haryana have witnessed an increase in divorce rate by 150 per cent since the last decade. The most literate state like Kerala has experienced an increase in divorce rate by 350 per cent in the last ten years. Though in Indian society, divorce is perceived negatively (Amato (1994)), in modern times divorce is more or less accepted based on the belief that dissolution of unhappy marriages does not affect the social welfare (Hussain (1983)). Such dramatic change in composition of demographics has legitimately attracted attention of the social scientists.

Naturally there is an immediate curiosity to understand whether there do exist any sort of causal relationship between diminishing family size and increasing divorce rate. An alternative way of approaching this quest is to understand whether nuclear families are

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¹ A *joint family* is characterized as a large undivided family where more than one generation lives together in a common house. On the other hand, a *nuclear family* denotes a couple and their dependent children regarded as a basic social unit.

² Divorce rate is defined as the percentage of marriages ending in divorce in a given year.

more susceptible to divorce compared to joint families? Burgess (1916) attributes the decline in family size to rapid industrialization. According to him, increased urbanization has increased individualism and secularism. The emancipation of women has transformed the family from a social institution based on law and custom to one based on companionship and love (Burgess (1916)). This apprehension of Burgess is supported by Becker (1981). Becker (1981) showed that higher female education, considered as an indicator of modernization and women's emancipation, increases women's chances in labor market and economic independence and decreases economic gains from marriage. So women with higher level of education divorce more easily. Hence it follows from both Burgess (1916) and Becker (1981) that disintegration of joint families and increase in divorce rates are not two segregated events. Enhanced awareness of individualism, which is the key aspect of modern society, has engendered the increased incidence of divorce rate as well as facilitated the process of contraction of family size.

Although both Burgess and Becker allege female education as the principal factor responsible for the continuous reduction in family size, yet the conclusion does not seem so straightforward. In a series of papers, Goode (1962, 1970 and 1993) observes the negative correlation between the level of female education and the composition of divorce. One of the possible explanations in support of Goode's observation is that education enhances the social, cultural, economic and cognitive skills. These resource endowments increase the stability of relationships either by successful partner matching or by enhancing communication skills and other factors that make a relationship work (Amato (1996), Hoem (1997), Ono (1998), Dronkers (2002)). So there exists substantial literature stating that higher female education and consequently their increasing participation in the labor market do not necessarily imply that the divorce rates would be high.

Besides these social aspects, the divorce legislation is another factor that plays an important role in determining the divorce rate. There are some countries even at present where divorce is not permitted by law, e.g. Argentina, Brazil, Chile, Colombia, Eire, Paraguay, Philippines. However we are not considering such countries in our framework. In fact, originally divorce legislation was a kind of state intervention to protect domestically specialized wives from being divorced against their will. But considering today's world, it is natural to presume that contemporary divorce legislation cannot have this singleton purpose only. An important component of the divorce legislation is the custody of a child which has a physical as well as legal aspect. The social institutions prevalent in a state can either provide *sole custody* or *joint custody*³. Physical and legal custody can be sole (the right of only one individual) or joint (a right shared between the individuals). In case of sole custody the child remains with one of the parents, mother in most occasions, after divorce. But in a joint custody, each parent is allowed to allocate some time to their children after divorce. Proponents of joint custody typically argue that children benefit from ongoing support and resources from both parents. This is captured in various dimensions such as behavioral and emotional adjustment (Bauserman (2002)), economic well-being (Seltzer (1991), Del Boca and Riberio (1998)), educational attainment (Teng (2006)) and parental involvement (Bowman and Ahrons (1985), Huang *et al* (2003)). However, the opponents object that children under joint custody are exposed to ongoing parental conflict (Kuehl (1989)). Interestingly the causal relationship between certain custody arrangements and children well-being is somehow obscure and the empirical evidence is mostly inconclusive. There are studies which find no convincing evidence for an impact of joint custody on divorce rates (Halla (2009)). So we raise the following question: does custody legislation have any impact on the incidence of divorce given the situation of family size contraction (which is a reality in contemporary world as discussed above)?

This paper addresses this question with the aid of a theoretical model. We consider a joint family consisting of husband, wife, their child and other family members of the husband. Both husband and wife derive utility from the consumption of a private good and a *household public good* which, in the proposed model is the well-being of the child. We assume that aspect of well-being of the child depends on the time spent voluntarily by the family members (parents and others) with him/her. In this model, we consider a situation which is characterized by frequent occurrence of conflict between the husband and wife. If there is no possibility of mitigation of their matrimonial friction, both husband and wife start to consider the option of divorce. This induces both of them to maximize his/her own utility instead of focusing on the family welfare i.e. joint utility. Starting from a point where both parents are indifferent between staying together and divorce irrespective of the prevailing child custody legislation, we investigate how such indifference changes in a nuclear family set-up under different custody arrangements.

We find that if court awards child custody to wife then both the parents strictly prefer divorce in nuclear family though they are indifferent in joint family. On the other hand, if husband gets the custody then he strictly prefers to stay together while wife's attitude towards divorce becomes ambiguous. Lastly, if both the parents are awarded joint physical custody then attitude of both towards divorce is ambiguous.

These results contribute in the literature by demonstrating that marriage is not always unstable in nuclear families. Thus the apprehension of Burgess (1916) and Becker (1981) is not a general one. Further we outline that stability of marriage is also intrinsically related with the child custody arrangement in post-divorce equilibrium. These results have important policy implications too, in the sense that as far as marriage stability in nuclear family is concerned, awarding child custody to husband is to some extent better than awarding joint physical custody. Because marriage stability under joint physical custody legislation requires multiple conditions to be satisfied for both husband and wife. In contrast, when husband is the sole custodian, marriage becomes stable only if the one condition holds good for wife. It is relatively easy to satisfy one condition compared to satisfy multiple conditions.

³ In the event of divorce, court awards parents legal and physical custody. *Sole custody* is an arrangement where the child physically stays with one of the parents, called the custodian. The other parent, called the non-custodian, has neither physical nor legal custody rights. *Joint custody* can take two alternative forms – *joint physical custody* and *joint legal custody*. In the former case, the child is allowed to spend some time with each parent stipulated by the court. However, in case of joint legal custody the child is allowed physical custody of one of the parents but both the parents participate in the child rearing decision making. In other words, child rearing cost is shared by the parents.

It has been observed that the existing literature, despite considering in isolation issues like custody legislations, divorce rate and child's welfare, has not addressed the holistic scenario. Hence the question of the impact of custody legislation on the incidence of divorce given the situation of family size contraction is mostly unanswered. One probable reason may be the fact that joint family structure has become extinct long ago in the industrialized and developed Western world. So such analysis is not relevant in the social scenario prevailing in those countries and hence it perhaps did not attract much attention. But joint families can still be very much observed in the developing countries of the East and South-East⁴ Asia. The following section presents the model and the section following concludes.

The Model

We consider a joint family comprising of husband, wife, their child and other members of the husband's family. By 'other members' we mean husband's parents, his uncles, aunties, cousin brothers and sisters and so on. So in another sense we can also call it an extended joint family. The husband is represented as individual 'h' and the wife as individual 'w'. Both the parents derive utility from the consumption of a private good and a household public good which is child's welfare.

Child's welfare is provided by the amount of time spent voluntarily by all the family members with him/her. Suppose the husband spends L_h and the wife spends L_w amount of time with the child. Also let the other family members spend a fixed amount of time $\theta > 0$. Therefore, the total time spent by all the individuals is $(L_h + L_w + \theta)$. Without the loss of generality, we assume that one unit of contributed time generates one unit of welfare. Thus the total amount of child's welfare is $(L_h + L_w + \theta)$. The amount of private good consumed by the i^{th} individual is represented as $x_i, \forall i = h, w$. All the goods are normal in consumption and the price of private good is normalized to unity. Further, let T be the given endowment of time available to each individual and w_i be the wage rate of the i^{th} individual, $\forall i = h, w$. We write the utility function of the i^{th} parent as:

$$U_i = u^i(G, x_i)$$

Here G is the total amount of child's welfare. So $G = L_i + L_j + \theta; \forall i, j = h, w$ and $i \neq j$. Also let $u_G^i, u_x^i, u_{Gx}^i = u_{xG}^i > 0$ and $u_{GG}^i, u_{xx}^i < 0 \forall i, j = h, w$. Substituting the value of G in the above equation we get:

$$U_i = u^i(L_i + L_j + \theta, x_i) \tag{1}$$

The budget constraint of each individual is $x_i \leq w_i(T - L_i)$. Since this is a static model so there is no incentive for savings in equilibrium. Hence the budget constraint holds with equality.

The pre-divorce situation has been characterized by frequent occurrence of conflict between the husband and wife. Such conflicts result in the diminution of mutual empathy and companionship. Hence both husband and wife tend to become more self-centric. However, the child's welfare remains a common interest in their utility function specification. It means that each parent fails to internalize the externality that the other individual generates and ends up in maximizing his/her utility given in equation (1) subject to his/her own budget constraint which holds with equality.

Substituting $x_i = w_i(T - L_i)$ in equation (1) and maximizing it with respect to $L_i > 0$ we obtain the following first order condition of the i^{th} individual:

$$u_G^i(L_i + L_j + \theta, w_i(T - L_i)) - w_i u_x^i(L_i + L_j + \theta, w_i(T - L_i)) = 0 \tag{2}$$

Solving equation (2) we obtain $L_i = L_i(L_j)$, which is the reaction function of the i^{th} parent. Let us call it R_i . Differentiating totally both sides of equation (2) we get:

$$(u_{GG}^i - 2w_i u_{Gx}^i + w_i^2 u_{xx}^i) dL_i + (u_{GG}^i - w_i u_{Gx}^i) dL_j = 0$$

This implies:

$$\frac{dL_i}{dL_j} = - \frac{(u_{GG}^i - w_i u_{Gx}^i)}{(u_{GG}^i - 2w_i u_{Gx}^i + w_i^2 u_{xx}^i)}$$

Substituting $i=h, j=w$ in the above equation we get the slope of R_h as follows:

$$\left. \frac{dL_w}{dL_h} \right|_{R_h} = - \frac{(u_{GG}^h - 2w_h u_{Gx}^h + w_h^2 u_{xx}^h)}{(u_{GG}^h - w_h u_{Gx}^h)} < 0$$

Similarly substituting $i=w, j=h$ in the above equation we get the slope of R_w as follows:

⁴ India is a glaring example where joint families still persist in the social system, although the number has reduced from the past.

$$\frac{dL_w}{dL_h} \Big|_{R_w} = - \frac{(u_{GG}^w - w_w u_{Gx}^w)}{(u_{GG}^w - 2w_w u_{Gx}^w + w_w^2 u_{xx}^w)} < 0$$

The uncoordinated Nash equilibrium is obtained at the point where the two reaction functions intersect i.e. E (see figure 1). Let us denote the Nash equilibrium level of contributions of male and female parents as L_h^* and L_w^* respectively. Now, the stability of the equilibrium requires the reaction function of husband must be steeper than the reaction function of wife. For this the following condition must be satisfied:

$$(u_{GG}^h - 2w_h u_{Gx}^h + w_h^2 u_{xx}^h)(u_{GG}^w - 2w_w u_{Gx}^w + w_w^2 u_{xx}^w) > (u_{GG}^h - w_h u_{Gx}^h)(u_{GG}^w - w_w u_{Gx}^w) \tag{3}$$

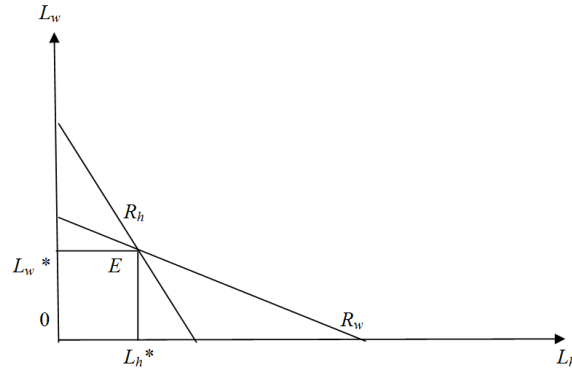


Figure 1

Substituting the values of L_i^* and L_j^* in equation (1) we get the equilibrium value of utility of the i^{th} individual.

$$U_i^* = u^i(L_i^* + L_j^* + \theta, w_i(T - L_i^*)) \tag{4}$$

From the values of L_h^* and L_w^* we state the following lemma.

Lemma 1: $\frac{dL_h^*}{d\theta} < 0$ and $\frac{dL_w^*}{d\theta} < 0$.

Proof: Since L_h^* and L_w^* satisfy equation (2) for $\forall i, j = h, w$ and $i \neq j$, so after substituting the values of L_h^* and L_w^* in equation (2) we get the following:

$$u_G^h(L_h^* + L_w^* + \theta, w_h(T - L_h^*)) - w_h u_x^h(L_h^* + L_w^* + \theta, w_h(T - L_h^*)) = 0 \tag{5}$$

$$u_G^w(L_h^* + L_w^* + \theta, w_w(T - L_w^*)) - w_w u_x^w(L_h^* + L_w^* + \theta, w_w(T - L_w^*)) = 0 \tag{6}$$

Totally differentiating both sides of equations (5) and (6) we obtain:

$$(u_{GG}^h - 2w_h u_{Gx}^h + w_h^2 u_{xx}^h) dL_h^* + (u_{GG}^h - w_h u_{Gx}^h) dL_w^* = (w_h u_{Gx}^h - u_{GG}^h) d\theta \tag{7}$$

$$(u_{GG}^w - w_w u_{Gx}^w) dL_h^* + (u_{GG}^w - 2w_w u_{Gx}^w + w_w^2 u_{xx}^w) dL_w^* = (w_w u_{Gx}^w - u_{GG}^w) d\theta \tag{8}$$

Therefore, equations (7) and (8) yield the following results:

$$\frac{dL_h^*}{d\theta} = \frac{w_w u_{Gx}^w u_{GG}^h - w_w^2 u_{GG}^h u_{xx}^w - w_h w_w u_{Gx}^h u_{Gx}^w + w_h w_w^2 u_{Gx}^h u_{xx}^w}{(u_{GG}^h - 2w_h u_{Gx}^h + w_h^2 u_{xx}^h)(u_{GG}^w - 2w_w u_{Gx}^w + w_w^2 u_{xx}^w) - (u_{GG}^h - w_h u_{Gx}^h)(u_{GG}^w - w_w u_{Gx}^w)} \tag{9}$$

$$\frac{dL_w^*}{d\theta} = \frac{w_h u_{Gx}^h u_{GG}^w - w_h^2 u_{GG}^w u_{xx}^h - w_h w_w u_{Gx}^w u_{Gx}^h + w_w w_h^2 u_{Gx}^w u_{xx}^h}{(u_{GG}^h - 2w_h u_{Gx}^h + w_h^2 u_{xx}^h)(u_{GG}^w - 2w_w u_{Gx}^w + w_w^2 u_{xx}^w) - (u_{GG}^h - w_h u_{Gx}^h)(u_{GG}^w - w_w u_{Gx}^w)} \tag{10}$$

It follows from equation (3) that the denominators of equations (9) and (10) are positive. Also observe that the numerators of both the equations are negative. Thus we have-

$$\frac{dL_h^*}{d\theta} < 0 \text{ and } \frac{dL_w^*}{d\theta} < 0$$

This completes the proof of the lemma.

Also it follows from equation (9) and (10):

$$\left| \frac{dL_h^*}{d\theta} \right| < 1 \text{ and } \left| \frac{dL_w^*}{d\theta} \right| < 1.$$

Since the contributions of both husband and wife are strategic substitutes, especially in the pre-divorce situation, so a unit increase in contribution by the other family members induces both the parents to reduce their own contribution. Also we can see that the rate of such substitution is less than unity.

Now let us consider the situation when mitigation of frequent occurrence of conflict between the husband and wife is not possible any further. Under such circumstances, both husband and wife are induced to consider divorce as an option. In the process of construction of our proposed theoretical model, we start from a state where an individual (both husband and wife) is indifferent between divorce and staying together. We show how this indifference changes in a nuclear family set-up under different child custody arrangements.

The Case of Divorce

In this section we consider two types of child custody arrangements⁵. In the first case we consider ‘sole custody’ where law permits the child to stay physically with one of the parents. In the past, usually mother used to get the custody most of the times. But now-a-days, father getting the child custody is quite common, at least in the U.S. So we consider both the cases here. In another section we consider the case of joint physical custody where the child is allowed to spend some time with both the parents as stipulated by the court. For simplicity, we assume that the individuals decide to stay single after divorce i.e. there is no possibility of re-marriage.

The Case of Sole Custody

We divide this section into two sub-sections. In the next sub-section we assume wife to be the sole custodian of child. The following sub-section considers husband to get the sole custody.

Wife as the sole custodian

After divorce the court awards child custody to the wife. She stays in her parental home with the child along with her family members. Suppose the total amount of time spent with the child by her family members is $\alpha > 0$.

Then the utility function of wife becomes:

$$U_w = u^w(L_w + \alpha, w_w(T - L_w)) \tag{11}$$

After maximizing equation (11) with respect to $L_w > 0$ we get the following first order condition:

$$u_G^w(L_w + \alpha, w_w(T - L_w)) - w_w u_x^w(L_w + \alpha, w_w(T - L_w)) = 0$$

Solving the above equation we obtain the equilibrium value of L_w . Let us call it L'_w .

The second order condition for maximization requires:

$$u_{GG}^w - 2w_w u_{Gx}^w + w_w^2 u_{xx}^w < 0$$

Thus substituting the value of L'_w in equation (11) we obtain the value of utility of the wife in the post divorce equilibrium as:

$$U'_w = u^w(L'_w + \alpha, w_w(T - L'_w)) \tag{12}$$

Putting $i = w$ and $j = h$ in equation (4) and comparing it with equation (12) we get the following proposition:

Proposition 1.1: *If wife has the sole child custody then she always prefers divorce in nuclear family set-up as compared to the indifference in joint family set-up.*

Proof: Suppose for $\theta = \bar{\theta} > 0$, the wife is indifferent between divorce and staying together. It implies from equations (4) and (12):

$$u^w(L'_w + \alpha, w_w(T - L'_w)) = u^w(L_h^* + L_w^* + \bar{\theta}, w_w(T - L_w^*))$$

Let us define the classifier function as follows:

$$\phi(\theta) = u^w(L'_w + \alpha, w_w(T - L'_w)) - u^w(L_h^* + L_w^* + \theta, w_w(T - L_w^*)) \tag{13}$$

Here $\phi(\bar{\theta}) = 0$. Differentiating both sides of equation (13) with respect to θ and using the envelope condition we obtain:

$$\frac{d\phi}{d\theta} = -u_G^w(L_h^* + L_w^* + \theta, w_w(T - L_w^*)) \left(\frac{dL_h^*}{d\theta} + 1 \right) \tag{14}$$

⁵ The issue of alimony and child support payment is kept out of consideration to keep the algebra tractable.

From lemma 1 we have $\frac{dL_h^*}{d\theta} < 0$ and $\left| \frac{dL_h^*}{d\theta} \right| < 1$, therefore we conclude from equation (14) that $\frac{d\phi}{d\theta} < 0$.

Thus $\phi(\theta)$ is monotonically negatively sloped function intersecting the θ -axis at $\theta = \bar{\theta} > 0$. It follows clearly $\phi(0) > 0$. This implies the wife strictly prefers divorce in a nuclear family despite being indifferent in the same situation in joint family.

In a joint family set-up, both husband and wife enjoy the externality arising from the contribution of other family members towards child's welfare. The externality is completely lost in nuclear family set-up. Given the contribution of wife, husband increases his own contribution in response to fall in other members' contribution. But observe from lemma 1 it is clear if contribution of other members reduces by one unit, husband increases his contribution by less than one unit. This makes it amply clear that rise in husband's contribution cannot adequately compensate for the fall in other members' contribution. Thus child's welfare suffers. Now in post-divorce equilibrium, husband does not contribute and in response to that wife increases her own contribution. But this increase is less in magnitude than the loss of husband's contribution. So child's welfare falls further. In this situation, the contribution of wife's family members help in compensating the loss and makes child's welfare at least as high as that in staying together. This makes the wife worse off in staying together and thus she prefers divorce although she does not strictly prefer the same in joint family.

Now we write the value of utility of the husband in divorce equilibrium as:

$$U'_h = u^h(L'_w + \alpha, w_h T) \tag{15}$$

Putting $i = h$ and $j = w$ in equation (4) and comparing it with equation (15) we get the following proposition:

Proposition 1.2: *If wife has the sole child custody then husband always prefers divorce in nuclear set-up even though he is indifferent in joint family set-up.*

Proof: Suppose for $\theta = \underline{\theta} > 0$, the husband is indifferent between divorce and staying together. It implies from equations (4) and (15):

$$u^h(L'_w + \alpha, w_h T) = u^h(L_h^* + L_w^* + \theta, w_h(T - L_h^*))$$

Let us define the classifier function as follows:

$$\psi(\theta) = u^h(L'_w + \alpha, w_h T) - u^h(L_h^* + L_w^* + \theta, w_h(T - L_h^*)) \tag{16}$$

Here $\psi(\underline{\theta}) = 0$. Now differentiating both sides of equation (16) with respect to θ and using the envelope condition, we get:

$$\frac{d\psi}{d\theta} = -u^h_h(L_h^* + L_w^* + \theta, w_h(T - L_h^*)) \left(1 + \frac{dL_w^*}{d\theta} \right) \tag{17}$$

It follows from lemma 1 that $(dL_w^*/d\theta) < 0$ and $|dL_w^*/d\theta| < 1$. Thus from the equation (17) we can conclude that $(d\psi/d\theta) < 0$. This makes $\psi(\theta)$ monotonically negatively sloped function intersecting the θ -axis at $\theta = \underline{\theta} > 0$. Hence it follows $\psi(0) > 0$. This completes the proof of the proposition. \square

The intuition of proposition 1.2 is very similar to that of proposition 1.1. Next we combine propositions 1.1 and 1.2 into a single proposition.

Proposition 1: *If wife has the sole custody of child under sole custody regime, both husband and wife are strictly better off in divorce in a nuclear set-up even though they remain indifferent in similar custody arrangement in joint family set-up.*

Proof: See the discussion above.

Proposition 1 explains the sudden upsurge in divorce rate all over the world in the last century with the disintegration of joint families and subsequent emergence of nuclear families. In other words, it explains why divorce rates were much lower when joint families existed. So far, it establishes a link between the apprehensions of Burgess (1916) and Becker (1981) that women emancipation initiated decline of joint families and led to further shrinking of family size through increase in incidence of divorce.

Husband as the sole custodian

Here we assume now that the court awards child custody to the husband. This means the child stays with the husband and enjoys the contribution of husband's family members.

Then the utility function of husband becomes:

$$U_h = u^h(L_h + \theta, w_h(T - L_h)) \tag{18}$$

After maximizing equation (18) with respect to $L_h > 0$ we get the following first order condition:

$$u_G^h(L_h + \theta, w_h(T - L_h)) - w_h u_x^h(L_h + \theta, w_h(T - L_h)) = 0$$

Solving the above equation we obtain the equilibrium value of L_h . Let us call it L_h' .

The second order condition for maximization requires: $u_{GG}^h - 2w_h u_{Gx}^h + w_h^2 u_{xx}^h < 0$

Thus substituting the value of L_h' in equation (18) we obtain the value of utility of the husband in post-divorce equilibrium as:

$$U_h'' = u^h(L_h' + \theta, w_h(T - L_h')) \tag{19}$$

Putting $i = h$ and $j = w$ in equation (4) and comparing it with equation (19) we get the following proposition:

Proposition 2: *If husband has the sole child custody then he is always worse off in divorce in nuclear family set-up as compared to the indifference in joint family set-up.*

Proof: Suppose for $\theta = \theta' > 0$, the husband is indifferent between divorce and staying together. It implies from equations (4) and (19):

$$u^h(L_h' + \theta', w_h(T - L_h')) = u^h(L_h^* + L_w^* + \theta', w_h(T - L_h^*))$$

$$\text{Let us define: } \lambda(\theta) = u^h(L_h' + \theta, w_h(T - L_h')) - u^h(L_h^* + L_w^* + \theta, w_h(T - L_h^*)) \tag{20}$$

Here $\lambda(\theta') = 0$. Differentiating both sides of equation (20) with respect to θ and using the envelope condition we obtain:

$$\frac{d\lambda}{d\theta} = u_G^h(L_h' + \theta, w_h(T - L_h')) - u_G^h(L_h^* + L_w^* + \theta, w_h(T - L_h^*)) \left(\frac{dL_w^*}{d\theta} + 1 \right) \tag{21}$$

We can observe from the slope of R_h that we have $|dL_h / dL_w| < 1$. This means for one unit fall in L_w , L_h rises by less than one unit. On the right hand side of equation (21), at given level of θ , when L_w falls by L_w^* amount then L_h rises from L_h^* to L_h' . But from the discussion above it is clear that $L_h' - L_h^* < L_w^*$. So the first term on the right hand side signifies a lower level of child's welfare. Since $u_{GG}^h < 0$, so it must be that $u_G^h(L_h' + \theta, w_h(T - L_h')) > u_G^h(L_h^* + L_w^* + \theta, w_h(T - L_h^*))$.

Again from lemma 1 we have $(dL_w^* / d\theta) < 0$ and $|dL_w^* / d\theta| < 1$. Thus $\left(\frac{dL_w^*}{d\theta} + 1 \right)$ is a proper fraction. So we can unambiguously conclude the following:

$$u_G^h(L_h' + \theta, w_h(T - L_h')) > u_G^h(L_h^* + L_w^* + \theta, w_h(T - L_h^*)) \left(\frac{dL_w^*}{d\theta} + 1 \right)$$

In other words, $(d\lambda / d\theta) > 0$. Thus $\lambda(\theta)$ is monotonically positively sloped function intersecting the θ -axis at $\theta = \theta' > 0$. It follows clearly $\lambda(0) < 0$. Hence the statement of proposition follows.

In a joint family set-up, both husband and wife enjoy the externality arising from the contribution of other family members towards child's welfare. The externality is completely lost in nuclear family set-up. Given the contribution of husband, wife increases her own contribution in response to fall in other members' contribution. From lemma 1 it is sufficiently clear that rise in wife's contribution cannot adequately compensate for the fall in other members' contribution. Thus child's welfare suffers. Situation becomes even worse in divorce. Wife does not contribute anymore and increase in husband's contribution falls short of the reduction in wife's contribution. So child's welfare reduces even further. Hence divorce in a nuclear set-up affects the husband even more adversely than staying together. Consequently, he strictly prefers to stay together.

Now we write the value of utility of the wife in divorce equilibrium as:

$$U_w'' = u^w(L_h' + \theta, w_w T) \tag{22}$$

Putting $i = w$ and $j = h$ in equation (4) and comparing it with equation (22) we get the following proposition:

Proposition 3: *If husband has the sole child custody then wife in a nuclear family structure;*

Always demands divorce if

$$u_G^w(L_h' + \theta, w_w T) \left(1 + \frac{dL_h'}{d\theta}\right) < u_G^w(L_h^* + L_w^* + \theta, w_w(T - L_w^*)) \left(1 + \frac{dL_h^*}{d\theta}\right).$$

Always prefers to stay together if

$$u_G^w(L_h' + \theta, w_w T) \left(1 + \frac{dL_h'}{d\theta}\right) > u_G^w(L_h^* + L_w^* + \theta, w_w(T - L_w^*)) \left(1 + \frac{dL_h^*}{d\theta}\right).$$

Proof: Suppose for $\theta = \theta'' > 0$, the wife is indifferent between divorce and staying together. It implies from equations (4) and (22):

$$u^w(L_h' + \theta'', w_w T) = u^w(L_h^* + L_w^* + \theta'', w_w(T - L_w^*))$$

$$\text{Let us define: } \mu(\theta) = u^w(L_h' + \theta, w_w T) - u^w(L_h^* + L_w^* + \theta, w_w(T - L_w^*)) \tag{23}$$

Thus we have $\mu(\theta'') = 0$. Differentiating both sides of equation (23) with respect to θ and using the envelope condition we obtain:

$$\frac{d\mu}{d\theta} = u_G^w(L_h' + \theta, w_w T) \left(1 + \frac{dL_h'}{d\theta}\right) - u_G^w(L_h^* + L_w^* + \theta, w_w(T - L_w^*)) \left(1 + \frac{dL_h^*}{d\theta}\right) \tag{24}$$

If $u_G^w(L_h' + \theta, w_w T) \left(1 + \frac{dL_h'}{d\theta}\right) < u_G^w(L_h^* + L_w^* + \theta, w_w(T - L_w^*)) \left(1 + \frac{dL_h^*}{d\theta}\right)$, then $\frac{d\mu}{d\theta} < 0$. Thus $\mu(\theta)$ is negatively sloped monotonic function intersecting the θ -axis at $\theta = \theta'' > 0$. It implies $\mu(0) > 0$. Hence the wife strictly prefers divorce in nuclear set-up.

Conversely, if $u_G^w(L_h' + \theta, w_w T) \left(1 + \frac{dL_h'}{d\theta}\right) > u_G^w(L_h^* + L_w^* + \theta, w_w(T - L_w^*)) \left(1 + \frac{dL_h^*}{d\theta}\right)$ then wife strictly prefers to stay together in a nuclear family structure. This completes the proof of the proposition.

In the proof of the proposition 2, we have already shown that $L_h' < L_h^* + L_w^*$. Thus nuclear set-up reduces child's welfare in divorce. But it is also true that after divorce, wife spends her entire income in consumption which was not the case in pre-divorce equilibrium. So she consumes a higher amount of private good. If the loss of utility from reduced child's welfare is adequately compensated by the gain in utility from higher private consumption, then wife strictly prefers divorce in a nuclear family. In the converse situation wife strictly prefers to stay together.

The Case of Joint Custody

In this section we consider that the court awards joint physical custody of the child. This means the child spends some time with both the parents separately. We assume that the law allows i^{th} parent to spend only $\hat{L}_i < L_i^*$ amount of time with the child. Now when the child stays with the husband, he/she also gets the opportunity to spend some time with other family members of the husband. Let that be $\hat{\theta} < \theta$. More precisely, say $\hat{\theta} = \theta - \varepsilon; \varepsilon > 0$. Likewise, while staying with the wife the amount of time spent by family members of wife be $\hat{\alpha} < \alpha$. So the value of utility of the i^{th} individual in the post-divorce equilibrium becomes:

$$\hat{U}_i = u^i(\hat{L}_i + \hat{L}_j + \theta - \varepsilon + \hat{\alpha}, w_i(T - \hat{L}_i)) \quad \forall i, j = h, w \text{ and } i \neq j \tag{25}$$

Suppose for $\theta = \tilde{\theta} > 0$ the i^{th} individual becomes indifferent between divorce and staying together. Thus it follows from equations (4) and (25):

$$u^i(\hat{L}_i + \hat{L}_j + \tilde{\theta} - \varepsilon + \hat{\alpha}, w_i(T - \hat{L}_i)) = u^i(L_i^* + L_j^* + \tilde{\theta}, w_i(T - L_i^*)) \tag{26}$$

$$\text{Let us call } \eta(\theta) = u^i(\hat{L}_i + \hat{L}_j + \theta - \varepsilon + \hat{\alpha}, w_i(T - \hat{L}_i)) - u^i(L_i^* + L_j^* + \theta, w_i(T - L_i^*)) \tag{27}$$

From equation (27) we have $\eta(\tilde{\theta}) = 0$. Now differentiating both sides of equation (27) with respect to θ and using the envelope condition we get the following:

$$\frac{d\eta}{d\theta} = u_G^i(\hat{L}_i + \hat{L}_j + \theta - \varepsilon + \hat{\alpha}, w_i(T - \hat{L}_i)) - u_G^i(L_i^* + L_j^* + \theta, w_i(T - L_i^*)) \left(\frac{dL_j^*}{d\theta} + 1 \right) \quad (28)$$

From lemma 1 it follows that $\frac{dL_j^*}{d\theta} < 0$ and $\left| \frac{dL_j^*}{d\theta} \right| < 1$. So from equation (28) we conclude if

$$u_G^i(\hat{L}_i + \hat{L}_j + \theta - \varepsilon + \hat{\alpha}, w_i(T - \hat{L}_i)) < u_G^i(L_i^* + L_j^* + \theta, w_i(T - L_i^*)) \left(\frac{dL_j^*}{d\theta} + 1 \right) \text{ then } \frac{d\eta}{d\theta} < 0 .$$

So $\eta(\theta)$ is a monotonically decreasing function intersecting θ -axis at $\tilde{\theta} > 0$. Then it must be $\eta(0) > 0$. This implies i^{th} individual strictly prefers divorce in nuclear set-up. Conversely, if

$$u_G^i(\hat{L}_i + \hat{L}_j + \theta - \varepsilon + \hat{\alpha}, w_i(T - \hat{L}_i)) > u_G^i(L_i^* + L_j^* + \theta, w_i(T - L_i^*)) \left(\frac{dL_j^*}{d\theta} + 1 \right) \text{ then } i^{th} \text{ individual strictly dislikes}$$

divorce. This result is stated as the next proposition.

Proposition 4: *In the regime of joint physical custody of child after divorce, in a nuclear set-up an i^{th} individual; strictly prefers divorce if*

$$u_G^i(\hat{L}_i + \hat{L}_j + \theta - \varepsilon + \hat{\alpha}, w_i(T - \hat{L}_i)) < u_G^i(L_i^* + L_j^* + \theta, w_i(T - L_i^*)) \left(\frac{dL_j^*}{d\theta} + 1 \right);$$

strictly prefers to stay together if

$$u_G^i(\hat{L}_i + \hat{L}_j + \theta - \varepsilon + \hat{\alpha}, w_i(T - \hat{L}_i)) > u_G^i(L_i^* + L_j^* + \theta, w_i(T - L_i^*)) \left(\frac{dL_j^*}{d\theta} + 1 \right).$$

Proof: See the discussion above.

The conditions stated in proposition 4 can be interpreted intuitively. Observe that joint physical custody regime dictates each individual to spend less time with the child than he/she used to do in pre-divorce equilibrium. This coupled with the time spent by family members of husband and wife make the post-divorce level of child's welfare ambiguous in respect of its pre-divorce level. On the other hand, each individual now consumes higher amount of private good as he/she has to spend less time with the child. Thus, if the post-divorce level of child's welfare is higher than before then it is sufficient to say that an individual strictly prefers divorce in nuclear set-up. Even if post-divorce child's welfare is lower but the benefit from increased private consumption outweighs the loss from reduced welfare of the child, then also the individual strictly prefers divorce. This is the intuition behind part (i) of proposition 4. Arguing conversely we can establish part (ii) of the proposition.

Propositions 2, 3 and 4 establish that claims of Burgess (1916) and Becker (1981) are not general ones. They hold only in some situations under a specific child custody regime. But there are some situations and custody arrangements where marriage is stable in a nuclear family. Thus women emancipation is not, in general, always responsible for smaller family size.

CONCLUSION

Using the theoretical framework discussed above, we find that if legislation awards child custody to wife then both the parents strictly prefer divorce in nuclear family though they were indifferent in joint family. On the other hand, if husband gets the custody then he strictly prefers to stay together while wife's attitude towards divorce becomes ambiguous. Lastly, if both the parents are awarded joint physical custody then attitude of both towards divorce is ambiguous.

The results contribute in the literature by demonstrating that marriage is not always unstable in nuclear families. Thus the apprehension of Burgess (1916) and Becker (1981) is not a general one. Further we outline that stability of marriage is also intrinsically related with the child custody arrangement in post-divorce equilibrium. Another contribution of the model we discussed is policy implications. From the results derived we can claim: as far as marriage stability in nuclear family is concerned, awarding child custody to husband is to some extent better than awarding joint physical custody. Because marriage stability under joint physical custody regime requires some conditions to be satisfied for both husband and wife. In contrast, when husband is the sole custodian, marriage becomes stable only if the required condition holds good for wife. It is relatively easy to satisfy one condition compared to meeting two different sets of conditions.

Here we haven't considered the emotional aspect of divorce arising from the complexity of separation process. We have looked into the problem from an economic perspective. Becker (1981) shows that apart from some other benefits, marriage brings in some economic gains to the partners. One of them is the benefit arising from efficient division of labor to exploit comparative advantage or increasing returns. In other words when the couple is happily married, coordination between them achieves efficient division of labor. But frequent and continuing conflict results in un-coordinated actions and thus, leads to inefficient division of labor. It makes both the parents worse off and culminates into separation. The proposed model uses this argument as the driving force behind divorce. Further, in such situation each individual wants respite from such conflicts which could impose negative externality on their professional lives as well. The emotional bonding that prevailed before the conflicts tend to reduce day by day and in such case divorce would mean negligible emotional cost on both.

The scope of this paper is limited to the theoretical exposition of the embedded dynamics so far. The empirical analysis of the theory proposed is a different body of work in its own right. The procedure of data collection, sample selection, removing the bias, along with exploratory and predictive analysis exacts appropriate attention which is fully recognized.

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