Multi-partner Fertility and Child Support

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April 27, 2012

Abstract

This study examines the effect of male and female multi-partner fertility (*i.e.* where fathers and mothers bear children with more than one partner) on non-resident fathers' child support payments towards and compliance with court-mandated child support orders. Child support payments and compliance rates are significantly reduced by male multi-partner fertility. However, the study finds novel evidence that female multi-partner fertility significantly increases child support compliance rates by almost 10% on average.

JEL Classifications: J1, J12

Keywords: Child Support, Multi-partner Fertility, Non-Resident Fathers

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I. Introduction

Parents having children with more than one partner or *multi-partner fertility*, has been rising steadily in the United States among both never-married and divorced parents. Studies have confirmed that more than 50% of urban unmarried parents were multi-partnered by the late 1990s – a figure only expected to rise as successive cohorts enter into childbearing age (Carlson and Furstenberg Jr., 2006; Guzzo and Furstenberg Jr., 2007; Logan et al., 2006; Bronte-Tinkew, Horowitz and Scott, 2009). Cancian, Meyer and Cook (2011) also found evidence that 31% of Wisconsin children whose parents divorced, had acquired half-siblings by their tenth birthday. It is then without question, that the implications of multi-partner fertility for child welfare must be critically examined.

One key measure of child welfare likely to be acutely influenced by this complex fertility behavior is child support. Child support payments are an important source of income for reducing child poverty as well as sustaining child wellbeing (Argys et al., 1998; Graham, Beller and Hernandez, 1994; Freeman and Waldfogel, 2001; Knox, 1996; Meyer and Hu, 1999). As such, reforms to child support enforcement policy[1] have helped to significantly boost collection rates of child support award payments from non-resident parents, typically fathers (Freeman and Waldfogel, 2001; Sorenson and Hill, 2004). Despite these efforts however, it has been widely documented that children living in complex families are more vulnerable to child support delinquency (*e.g.* Berger, Cancian and Meyer, 2011; Garasky et al., 2010; Manning and Smock,

[1]Reforms to child support enforcement policy include Child Support Amendments of 1984, Family Support Act of 1988, the Child Support Recovery Act of 1992, Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) of 1996, Child Support Performance and Incentive Act of 1998 (CSPIA).

2000; Manning, Stewart and Smock, 2003; Meyer, Cancian and Cook, 2005). This study will therefore examine the effects of multi-partner fertility among both men and women on court-mandated child support payments and compliance rates[2] of non-resident fathers.

The theoretical underpinnings of this research question are however, not clear-cut. Past studies have highlighted the implications of asymmetric information for post-divorce transfers, postulating that since non-resident fathers cannot effectively monitor the intra-household allocative decisions of custodial mothers, they will make sub-optimal transfer payments (*e.g.* Chiappori and Weiss, 2007; Del Boca and Flinn, 1995; Weiss and Willis 1985, 1993). In families where there are multiple childbearing partners, the asymmetric information problem could be amplified considerably, distorting both allocative and child support payment decisions. Therefore, to extend the prior theory on inter-household transfers, this paper will present a simple theoretical model which illustrates that within the context of multi-partner fertility, information asymmetry could boost or decrease fungible child support contributions.

To date, there are two empirical works that have assessed the effect of both male and female multi-partner fertility on child support. Nepomnyaschy and Garfinkel (2010) did not confirm a statistically significant relationship between multi-partner fertility and child support payments made towards a formal child support order. Meyer, Cancian and Cook (2005) found that multi-partner fathers paid smaller proportions of their total child support obligations and thus were less compliant with their child support orders; the effect of female multi-partner fertility on child support payments was not shown to be statistically different from zero. It is critical to note

[2] The child support compliance rate refers to the proportion of the child support obligation amount paid by a non-resident father.

however, that these studies did not address the bias related to unobserved heterogeneity. Childbearing with more than one partner constitutes complex fertility behavior, and is likely correlated with latent parental attributes. Moreover, a large percentage of non-resident fathers with a formal child support order do not pay child support (Del Boca and Flinn, 1995; Nepomnyaschy and Garfinkel, 2010; Roff, 2008; Sorenson, 1997; Willis, 1999), producing zero-inflated child support outcomes and subsequent bias in the OLS model.

Using longitudinal data from the Fragile Families and Child Wellbeing Study (FFCWS), the study measures the effect of multi-partner fertility on child support payments and compliance even as it addresses biases from both latent heterogeneity and zero-inflation. The paper confirms a robust adverse effect of male multi-partner fertility on average monthly child support payments and compliance rates. However, the study uncovers novel evidence that female multi-partner fertility yields higher child support compliance rates – having one additional male childbearing partner increases the average monthly child support compliance rate by almost 10%.

II. Theoretical Model

Prior theoretical works on child support outcomes reveal that subsequent to divorce, the non-custodial parent typically makes sub-optimal child support transfers to the custodial parent due to the monitoring problem and different intra-household allocative preferences (*e.g.* Chiappori and Weiss, 2007; Del Boca and Flinn, 1995; Weiss and Willis 1985, 1993). Although these studies have explored child support within the context of divorce, it has yet to be shown how transfers differ within complex family structures, particularly those formed by multi-partner fertility.

In theory, the effect of multi-partner fertility on child support is not the same for men and women. For the multi-partner (non-resident) father, children living in separate households trigger a significant asymmetric information problem, where the non-resident father finds it even more difficult to effectively monitor the intra-household allocative decisions of each childbearing partner. Since custodial mothers and the non-custodial father do not share the same preferences, his fungible child support payments could potentially be “taxed” by custodial mothers (Browning, Chiappori and Weiss, 2002; Weiss and Willis, 2003; Willis, 2004). Further, household diseconomies of scale and transaction costs make child rearing in separate households relatively more expensive for multi-partner fathers. These concerns render child support payments less effective in raising child welfare and thus multi-partner fathers will respond by significantly reducing transfers.

On the contrary, the relationship between female multi-partner fertility and child support is ambiguous. Information asymmetry concerning the mother’s intra-household allocative decisions will influence whether and to what extent male partners make child support contributions. A male partner may lower his child support payments and essentially free-ride on other partners’ and/or the mother’s resources (Weiss and Willis, 1993). However, it is also possible that child support contributions will be comparatively high, if male childbearing partners esteem child welfare more highly than their own or they make contributions independent of each other.

In this section, I present a simple theoretical framework that clearly illustrates how child support payments from the non-custodian (*i.e.* the father) change when a parent has children with more than one partner. First, the model shows child support transfers in the case where parents only have children with each other. This is juxtaposed to more complex family scenarios, where each parent bears children with one additional partner.

A. Model with no Multi-partner Fertility

Consider a family where a mother and father have two children, but the union has dissolved. The mother assumes the role of primary caregiver for these children and the father becomes the non-resident parent. Similar to Weiss and Willis (1985), I assume that children are couple-specific public goods after union dissolution occurs. The mother's utility is given by $U(\min\{C_1, C_2\}, X_m)$, where C_1 and C_2 represent the consumption functions of both children. X_m represents the mother's private consumption and given that the mother values both children equally (I assume this for simplicity), we can write $C_1 = C_2 = C$. Her budget constraint is $X_m = Y_m + S - 2C$, where $S\ (= S_1 + S_2)$ represents total child support payments from the non-resident father and Y_m denotes the mother's resources from labor, welfare benefits, etc. For simplicity, let us assume the mother's utility function follows the Cobb-Douglas form, $U = \alpha \ln(C) + (1-\alpha) \ln(X_m)$, where $\alpha \in (0,1)$ denotes the relative value she places on her children's consumption. Maximizing her utility function subject to her budget constraint produces the focal child's consumption function, $C = \frac{\alpha}{2}(Y_m + S)$, which increases in Y_m and S. The fraction of an additional dollar of child support (or mother's income) that is actually consumed by the focal child is equal to the slope of the consumption function, $\frac{dC}{dS} = \frac{\alpha}{2}$.

Although the focal child's father is non-resident, let us assume he knows the mother's utility function, and thus $C(S)$. He chooses S to maximize his utility $V = V(\min\{C_1(S), C_2(S)\}, X_f)$ subject to his budget constraint $X_f = Y_f - S$, where X_f denotes his private consumption and Y_f denotes his income. The father's utility function also follows a Cobb-Douglas utility of the form $V = \beta \ln(C) + (1-\beta) \ln(X_f)$, where $\beta \in (0,1)$ denotes the relative value he places on his children's consumption. Maximizing his utility function subject to his budget constraint yields the father's optimal child support transfer payments to the mother, $S^* = \beta Y_f - (1-\beta) Y_m$ if $S^* > 0$ and $S = 0$ if

$S^* \leq 0$. The optimal consumption level will be $C^* = \frac{\alpha}{2}\beta(Y_m + Y_f)$. It is clear then that S^* and C^* are increasing functions of β and Y_f, and decreasing functions of Y_m. (See Appendix A for full derivations).

B. Model with Male Multi-partner Fertility

Now consider the case where the father has two children, but with two different women, Mother 1 and Mother 2, who are primary caregivers for the children. For simplicity, I assume that both mothers have similar preferences (α), income (Y_m) and private consumption (X_m). Children are also assumed to be couple-specific public goods (Weiss and Willis, 1985). Each mother maximizes the Cobb-Douglas utility function of the form, $U'_i = \alpha \ln (C'_i) + (1\text{-}\alpha) \ln (X_m)$ subject to $X_m = Y_m + S'_i - C_i'$, where $i = \{1,2\}$. Assume the father of both children (whom he values equally) maximizes a utility function of the following form, $V(\min\{C'_1, C'_2\}, X_f)$ subject to $X_f = Y_f - S' - \lambda$, where S' ($= S'_1 + S'_2$) represents his total child support payments and λ denotes the household "fixed cost" associated with having children living in separate households. This fixed cost captures the multi-partner father's inability to take full advantage of household economies of scale as well as the higher transaction costs associated with child rearing in separate households. If V follows a Cobb-Douglas utility such that $V = \beta \ln (C') + (1\text{-}\beta) \ln (X_f)$, the optimal child support transfers function for each child is $S'_1{}^* = \frac{S* - \beta\lambda}{(1+\beta)} = S'_2{}^*$. The optimal consumption level for each child is then $C'_1{}^* = \alpha\, \beta\, [\frac{2\, Ym + Yf - \lambda}{(1+\beta)}] = C'_2{}^*$. This result implies that the multi-partner father will transfer less in child support to each household, and if $S^* < \frac{2\beta\lambda}{1-\beta}$, overall transfers to both children will be lower relative to the single-partner fertility case in Model (A). As λ rises therefore, the differential between S^* and S'^* will rise as well, producing lower C'^* for children of the multi-partner father. (See Appendix A for full derivations).

C. Model with Female Multi-partner Fertility

Consider the analogous case where the custodial mother has two children (whom she values equally) with two different partners, Father 1 and Father 2. For simplicity, I assume that these fathers have similar preferences (β), income (Y_f) and private consumption(X_f). Children are also assumed to be couple-specific public goods (Weiss and Willis, 1985). The mother maximizes the utility function, $U(min\{C''_1, C''_2\}, X_m)$ subject to $X_m = Y_m + S'' - 2C''$ where $S'' = S''_1 + S''_2$ and $C''_1 = C''_2 = C''$. Each child's father maximizes the utility of the form, $V''_i = V(C''_i, X_f)$ subject to $X_f = Y_f - S''_i$, where $i = \{1,2\}$. Assuming for simplicity that the utility functions follow the Cobb-Douglas form, maximization yields the child support transfer functions, $S''_1 = S^* - (1-\beta)\, S''_2$ for Father 1 and $S''_2 = S^* - (1-\beta)\, S''_1$ for Father 2. For each father, S''_i is a function of the other father's child support contributions. As such, the optimal response functions of both fathers can be modeled as Cournot and Stackelberg games.

Under the Cournot model, fathers choose their child support contributions simultaneously and independently of each other. The optimal child support payments by Father 1 and Father 2 are equal such that, $S''^{*}_1 = \frac{S*}{(2-\beta)} = S''^{*}_2$. Therefore, total child support contributions to the mother, $S''^{*} = \frac{2S*}{(2-\beta)}$, are greater than S^* for $\beta \epsilon (0,1)$ and $S^* > 0$. (See Appendix A for full derivations). Therefore, the Cournot solution illustrates that the multi-partner mother receives a positive child support premium from having two children with two different partners as opposed to having two children with the same partner, *ceteris paribus*. It highlights the possible child support gains to the multi-partner mother, independent of the relative value either father places on his child's consumption[3].

It is critical to note however, that information asymmetry and a lack of control over child expenditures could result in a the free-rider problem, where each father makes less than optimal child support payments in an attempt to defer his child support burden to the other partner (Weiss and Willis, 1993). This hence calls for the Stackelberg representation of the problem. Given uncertainty about the mother's intra-household allocation decisions, the Stackelberg model essentially allows the child support payments of one father (*i.e.* "the follower") to be responsive to the payments of the other father (*i.e.* "the leader"). This model accounts for the free-rider problem should either father attempt to shift his child support burden to the other party.

In the Stackelberg model, I assume Father 2 follows Father 1 and makes his transfers only after Father 1 decides on his child support payments. The Stackelberg solution yields $S''_1{}^* = S^* - (1-\beta)\, Y_f$, $S''_2{}^* = \beta\, S^* + (1-\beta)^2 Y_f$ and total optimal payments, $S''^* = (1+\beta)\, S^* - (1-\beta)\, \beta\, Y_f$. This solution illustrates that optimal payments under female multi-partner fertility relative to single-partnered fertility are ambiguous for $S''^* > 0$. (See Appendix A for full derivations). There are three possible cases that can be identified:

a. $S''^* = S^*$ if $\frac{\beta}{(1-\beta)} = \frac{Ym+Yf}{Yf}$. This implies that children are just as well off having separate fathers as if they had only one father. The condition holds if the relative value each father places on his child's consumption is equal to his relative income.

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[3] This result is different from the Cournot case in Weiss and Willis (1993), which exemplifies the free-rider problem between partners.

b. $S''* > S*$ if $\frac{\beta}{(1-\beta)} > \frac{Ym+Yf}{Yf}$. This implies that children are better off having separate fathers than if they had only one father. The condition holds if the relative value each father places on his child's consumption is greater than his relative income. Both fathers could provide substantial contributions such that both children are better off relative to the single-partnered fertility case. However, there may be a positive child support premium under female multi-partner fertility even if only one father values his child's consumption more highly than his own. This constitutes the *altruistic-father* effect. If Father 1 shirks his child support responsibilities, Father 2 may respond altruistically by increasing his child support contributions such that the welfare of both children is maintained. As a consequence, the mother may receive a positive child support premium under these circumstances.

c. $S''* < S*$ if $\frac{\beta}{(1-\beta)} < \frac{Ym+Yf}{Yf}$. This implies that children are worse off having separate fathers than if they had only one father. Children receive lower transfers in this case due to the free-rider problem. If mother's income is equal to zero, then $\frac{\beta}{(1-\beta)} < 1$ and each father values his private consumption more than his child's consumption. By the "first-mover advantage", Father 1 will most likely free-ride on Father 2's child support contributions. On the other hand, if the mother's income is greater than zero, both Father 1 and Father 2 are likely to evade their court-mandated child support responsibilities and free-ride on the mother's resources so long as the relative value placed on child consumption is lower than relative income.

In summary, the simple theoretical model illustrates that fertility with multiple partners for men is likely to lower child support payments in comparison to the simple family dissolution case.

Conversely, it is unclear how fertility with multiple males would affect child support receipts of the multi-partner mother: if the relative value each father places on his child's consumption is significantly higher than his relative income, transfers are likely to be higher in general. However, if the relative value each father places on his child's consumption is significantly lower than his relative income, this will ultimately lead to lower transfers.

III. Data and Methods

The data used to analyze this research question are obtained from the Fragile Families and Child Wellbeing Study (FFCWS), which aims at observing the characteristics, conditions and capabilities of unwed parents. The Study utilized stratified random sampling to select parents from twenty large urban cities with populations of 200,000 or more. Parents were initially interviewed when they were in the hospital for the birth of their child. This child is designated in the study as the *focal child*[4]. Nearly 5,000 children born from 1998 to 2000 were sampled and follow-up interviews were conducted when the focal child was approximately one, three and five years old; I create a panel dataset (spanning 1999 to 2006) using these follow-up interviews.

To empirically explore the research question, the following data restrictions are imposed. First, the analysis sample excludes mothers for whom the focal child's father is unknown, missing or has died. Second, the sample is restricted to mothers who are living with the focal child all or most of the time, ensuring that mothers represent the custodial parents in this empirical study. Third, the data are restricted to mothers who are neither married nor cohabiting with the focal child's father at the time the child support arrangement is observed. This ensures

[4] If the birth was a multiple birth, the Study chooses only one of the children as the focal child.

that child support transfer payments are not being allocated (directly or indirectly) to the father's private consumption. Furthermore, resident fathers provide unmeasured benefits by their very presence in the household, making them systematically different from non-resident fathers (Nepomnyaschy and Garfinkel, 2010).

Fertility behaviors of both parents are assessed at the follow-up interviews. Mothers are asked specifically about their number of childbearing partners as well as the number of childbearing partners of the other parent. To measure male and female multi-partner fertility, I created continuous indicators of the number of childbearing partners of mothers and fathers in the study. Figure 1 illustrates that majority of the parents in the analysis sample have more than one childbearing partner. In addition, both male and female multi-partner fertility are steadily rising, with females having a much steeper growth rate in multi-partner childbearing. By 2006, the average number of childbearing partners is approaching two, with the average number of childbearing partners for women exceeding the average number of childbearing partners for men.

The FFCWS also provides detailed information on child support transfers to the focal child. At each interview, mothers with court-ordered child support awards are asked about the date the legal agreement was reached, the amount of the award and how much of the award the non-resident father has paid since the agreement was reached. To take full advantage of these comprehensive child support data, the study will explore actual transfers made and compliance with the child support order.

The first outcome measure is defined as average monthly child support payments made towards a court-ordered child support award, *S*, and is calculated as:

$$S = \frac{Actual\ payments\ made\ since\ agreement\ date}{Number\ of\ Months\ \ since\ agreement\ date}.$$

It is imperative to assess monthly child support payments in conjunction with the obligation amount, given that there are significant differences between child support obligations and child support payments. Non-resident fathers may be observed in the data as making equal payments; however, they may have different rates of compliance with their court-mandated orders. As such, the second child support outcome measures compliance with the child support award, Π, calculated as:

$$\Pi = \frac{Average\ Monthly\ Child\ Support\ Payments\ (S)}{Total\ court{-}ordered\ monthly\ payment\ obligations}$$

where $\Pi \in [0,1]$[5]. Π represents the fraction of the child support obligation amount paid on average each month.

The study utilizes mother's reports on child support outcomes. While mothers have significantly high response rates in the FFCWS[6], father reports are more susceptible to non-response bias given that there are systematic differences between fathers who are interviewed by the FFCWS and those who are not (Nepomnyaschy, 2007; Nepomnyaschy and Garfinkel, 2010; Teitler, Reichman, and Sprachman 2003). Mothers do tend to underreport child support payments and compliance rates, but their reports are still more accurate than father reports (Schaeffer, Seltzer, and Klawitter, 1991; Nepomnyaschy and Garfinkel, 2010).

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[5] Although the compliance measure is right-censored at 1, there are some fathers who make child support contributions in excess of the amount required by the award.

[6] Approximately 96% of mothers have been interviewed at least once since the baseline interview.

Although child support payments and compliance are theoretically linked to multi-partner fertility, there are other relevant variables that are associated with these outcomes. The child support regression equations can therefore be expressed as:

$$S_{icy} = \omega_1 P^m_{icy} + \omega_2 P^f_{icy} + X_{icy}\,\omega_3 + R_{icy}\,\omega_4 + CSE_{icy}\,\omega_5 + \delta t + e_{icy} \quad (1)$$

$$\Pi_{icy} = \alpha_1 P^m_{icy} + \alpha_2 P^f_{icy} + X_{icy}\,\alpha_3 + R_{icy}\,\alpha_4 + CSE_{icy}\,\alpha_5 + \theta t + \varepsilon_{icy} \quad (2)$$

where *S* denotes average monthly formal child support payments (expressed in (constant) 2000 dollars) and Π denotes average monthly child support compliance rates of non-resident fathers; *i* indexes individual, *c* indexes city, and *y* indexes interview-year. $P^{m, f}$ are the continuous measures of the number of childbearing partners of mothers and fathers respectively. *R* is the vector of (logged) state-specific resource variables (including average TANF benefits, average male and female wages) and individual-specific resource variables lagged by one period (including parents' annual earnings and whether the focal child's mother is a welfare recipient); *X* is the vector of family and demographic characteristics including parents' age, race and education as well as the number of children each parent has individually; CSE is an annual index (spanning 1996 – 2006) that captures the child support enforcement performance of each of the fifteen states sampled by the FFCWS. The index is an average of the standard normal means of five key enforcement measures as specified by the Child Support Performance and Incentive Act (CSPIA) of 1998 (Huang and Edwards, 2009). The five measures are the paternity establishment rate, establishment rate of child support orders, collection rate of current child support orders, collection rate of child support in arrears, and cost effectiveness of the current enforcement system. The individual-specific time trend, *t*, is also added to the model to net out any spurious correlation between child support contributions and fertility behavior.

Estimating equations (1) and (2) using the OLS regression is expected to yield biased estimates of the multi-partner fertility effect. About 50% of fathers in the analysis sample have made no child support payments since the establishment of their child support orders and this accounts for substantial zero-inflation in the child support outcomes. To address the bias from zero-inflation, the standard censored Tobit model will be utilized. Since time-invariant latent characteristics (*e.g.* parental values, preferences, and information asymmetry) influence both fertility behavior and child support contributions, the study will also employ fixed effects (FE) estimation to mitigate this bias[7].

IV. Results

Non-resident fathers in the analysis sample pay an average of about $100 per month in child support for the focal child, yet their average rate of compliance with the child support order is only about 35% (see Table 1). Average child support payments and compliance also decline significantly for complex families. Multi-partner mothers receive on average, nearly $66 per month and the associated compliance rate is below 30%. In addition, multi-partner fathers pay an average of about $72 in child support to the focal child, but their compliance with the child support order is below 30% on average (see Table 2).

These differences in outcome means however, are associated with parental resources. The "Profile of Complex Families" presented in Table 2, shows that multi-partner parents (and their partners) are less likely to be college educated and have lower annual earnings in general. As a

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[7] An ideal solution to biases from both zero-inflation and unobserved heterogeneity would be the fixed effects-tobit (FE-Tobit) model. However, this method yields inconsistent findings in general (Greene, 2003).

consequence, the outcome mean differentials observed between complex and simple family structures may well be explained by these underlying socio-economic differences. Estimating equations (1) and (2) nonetheless, will yield the effects of multi-partner fertility on child support outcomes, net of these and other underlying correlations.

Table 3 presents the OLS, Tobit and FE estimates of regression equations (1) and (2). As predicted by the theoretical model, OLS and Tobit results (columns (1), (2), (3) and (4)) confirm the positive relationship between male resources and child support outcomes. College educated fathers make significantly more child support payments and are more compliant with their child support orders than fathers who have high school diplomas only. Moreover, annual earnings and average state wages for men are shown to increase payments and compliance rates in general. The OLS and Tobit results also reveal the inverse relationship between female resources and child support. Average state female wages and welfare participation substantially reduce child support payments and compliance rates of non-resident fathers.

Although parental resources are strongly associated with the child support outcomes, the results in Table 3 also illustrate the substantive relationship between multi-partner fertility and child support. The OLS model (column (1)) suggests that having one additional childbearing partner significantly lowers average monthly child support payments by $17 (or about 17% of a standard deviation) for multi-partner mothers and $14 (or about 14% of a standard deviation) for multi-partner fathers. Moreover, having one additional female childbearing partner significantly lowers the average rate of compliance by 3% or a little over 7% of a standard deviation (column(4)). The Tobit estimates are similarly substantive and robust, indicating that the bias from zero-inflation does not negate the adverse effects of male and female multi-partner fertility.

FE estimation on the other hand, does not fully corroborate the OLS and Tobit findings on multi-partner fertility. The FE model confirms the adverse effect of male multi-partner fertility on the child support outcomes: having one additional female childbearing partner lowers average monthly child support payments by nearly $20 (column (3)) and the non-resident father's average compliance rate by 6% in general (column (6)). In contrast to male multi-partner fertility, the effect of female multi-partner fertility on child support is not shown to be particularly detrimental to child support. Column (3) indicates that the effect of having one additional male childbearing partner on child support payments is positive but not statistically significant. However, FE estimates in column (6) reveal that having one additional male childbearing partner raises the rate of child support compliance by approximately 10% on average.

V. Discussion

The findings of this empirical study provide concrete support for the theoretical model of multi-partner fertility presented in Section II. When fathers have children in separate households, monitoring household allocative decisions of each custodial mother becomes exceedingly difficult (Weiss and Willis, 1985; 1993) and household diseconomies of scale raise the cost of fatherhood for multi-partner men. Consequently, male multi-partner is shown to significantly reduce average child support payments and compliance rates. It is important to note that the FE estimates are larger than the OLS estimates suggesting that latent transaction costs and asymmetric information contribute to upward biased OLS results.

The finding that multi-partner mothers experience significantly higher child support compliance corroborates both the Cournot and Stackelberg solutions. Partners of multi-partner mothers either do not consider the payments of other partner/s in determining their contributions (*i.e.* the Cournot Solution) or they esteem child welfare higher than their own (*i.e.* the Stackelberg solution).

Although these solutions do seem a bit unrealistic, there are other factors that may help facilitate these outcomes. For instance, within the context of state child support policies and guidelines, the Cournot solution is entirely plausible. Some states sanction child support awards that allow mothers with multiple childbearing partners to receive child support premiums relative to mothers who have children with one partner. State child support court systems typically determine child support awards for complex families on a case by case basis (Brito, 2005) and thus, it goes beyond the scope of this paper to determine how child support awards vary for multi-partner mothers in each state sampled by the FFCWS. Nonetheless, Meyer, Cancian and Cook (2005) gave a critical example of how multi-partner mothers in the state of Wisconsin might receive child support gains relative to their single-partner counterparts. In Wisconsin, if a mother has two children with one partner, the child support award for both children is 25% of the non-resident father's income. However, a mother with two children from two different partners will receive 17% of each non-resident father's income if each child is the father's firstborn[8]. Thus, Wisconsin mothers could receive up to a 9% child support premium from childbearing with two different partners, *ceteris paribus*. If other states have similar child support guidelines (and enforcement levels), the female-multi-partner fertility effect could essentially raise relative child support contributions. In this sense, the state child support system acts as facilitator to the Cournot solution, given that child support awards are determined exogenously.

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[8] If the child is the non-resident father's subsequent child, then the payment would be 17% of his remaining income.

Still, the positive effect of female multi-partner fertility only arises once omitted variable bias is addressed, and thus it is also likely that latent parental attributes help to understate the naïve female multi-partner fertility estimates. If this form of family complexity is linked to more contentious partner relationships for instance, then the multi-partner mother may be more pro-active in ensuring that her partners are compliant with their court-mandated child support orders. As such, the multi-partner mother may report child support delinquencies more frequently than her single-partner counterpart, thereby producing higher compliance rates in general. We could argue then, that the positive female multi-partner fertility effect predicted by the Stackelberg model is facilitated or even enhanced by the multi-partner mother's 'enforcement' efforts. Arguably, even if one partner is severely non-compliant with his child support order, the multi-partner mother will be less tolerant of child support delinquency from her other partner/s, raising her average compliance rate above the expected average under single-partner fertility. Therefore, what we perceive as a partner's high relative value on child welfare, is perhaps the multi-partner mother's intolerance of child support delinquency.

VI. Conclusion

Childbearing with more than one partner (*i.e.* multi-partner fertility) is becoming a global phenomenon, and this warrants a more profound look at how child support payments made and compliance with a formal child support order are being affected. The study presents a theoretical model that illustrates that childbearing with multiple partners is more costly for fathers (and thus lowers child support contributions) whereas mothers reap ambiguous child support rewards.

Using data from the Fragile Families and Child Wellbeing Study (FFCWS), the analyses produce strong empirical evidence in support of the theoretical model. By addressing biases from latent heterogeneity and zero-inflation, the study confirms the robust adverse effect of male multi-partner fertility on court-ordered child support payments and compliance of non-resident fathers. This finding also reinforces prior works by Weiss and Willis (1985, 1993) that highlight the asymmetric information problem associated with inter-household transfers under family dissolution. As male multi-partner fertility is associated with potentially large monitoring and household fixed costs, lower child support payments and compliance are produced. It is also critical to note that child support enforcement has not effectively eroded the influence of these costs on the multi-partner father's child support payment decisions. Child support policies seeking to address the prevalence of non-compliance in complex families would do well to explore options that allow non-resident fathers to make non-fungible investments in addition to or in lieu of fungible court-mandated child support payments, which are potentially misallocated by custodial mothers (Willis, 2004; Edin, 1995).

On the other hand, the study finds substantive evidence that multi-partner mothers experience higher average child support compliance rates once the bias from unobserved heterogeneity is mitigated. This result corroborates both the Cournot and Stackelberg solutions, and is likely facilitated by state child support guidelines and/or the multi-partner mother's low tolerance of child support delinquency. This novel finding calls for more research on the implications of family complexity for child support outcomes. Future studies would do well to explore state variations in child support policies for complex families as well as how relationship quality influences the likelihood and extent of child support delinquency in complex families.

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Figure 1. Trends in Male and Female Multi-partner Fertility

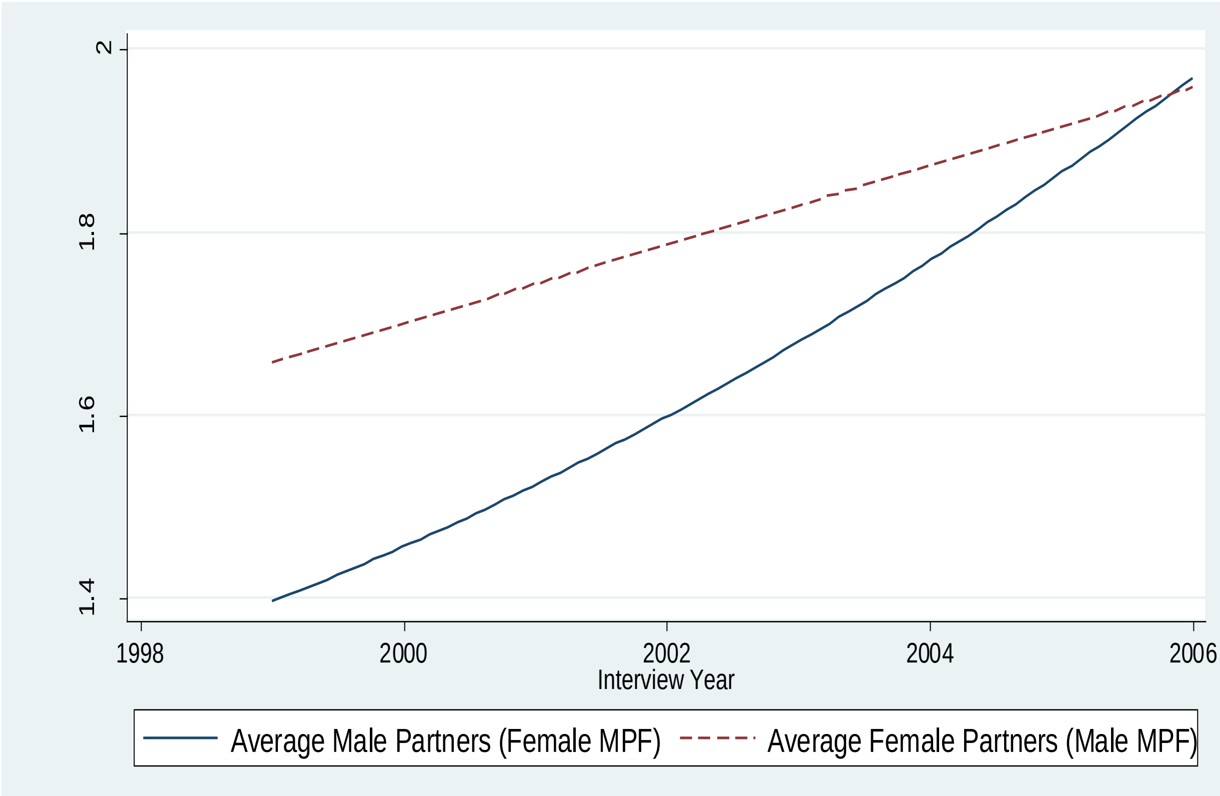

Table 1. General Summary Statistics (Weighted)

	Mean	SD	Min	Max
Payments (Monthly (constant 2000 dollars))	$103.79	($167.55)	0	$1871.739
Compliance Rate	0.35	(0.42)	0	1
Mother's Number of Childbearing Partners	1.59	(0.72)	1	6
Father's Number of Childbearing Partners	1.75	(0.86)	1	10
Mother's Age ≤ 22	0.27	(0.44)	0	1
23≤ Mother's Age ≤ 40	0.70	(0.46)	0	1
Mother's Age > 40	0.03	(0.17)	0	1
Father is younger than Mother	0.14	(0.35)	0	1
Father is the same age as Mother	0.08	(0.26)	0	1
Father is older than Mother	0.78	(0.41)	0	1
Mother – White	0.28	(0.45)	0	1
Mother – Black	0.47	(0.50)	0	1
Mother – Hispanic	0.23	(0.42)	0	1
Mother – Other Race	0.02	(0.15)	0	1
Father – White	0.19	(0.40)	0	1
Father – Black	0.49	(0.50)	0	1
Father – Hispanic	0.26	(0.44)	0	1
Father – Other Race	0.05	(0.22)	0	1
Parents have different Race/Ethnicity	0.22	(0.41)	0	1
Mother is High School Dropout	0.31	(0.46)	0	1
Mother has High School Diploma	0.32	(0.47)	0	1
Mother has Some College Education	0.33	(0.47)	0	1
Mother has College Degree or More	0.04	(0.20)	0	1
Father is High School Dropout	0.27	(0.44)	0	1
Father has High School Diploma	0.43	(0.50)	0	1
Father has Some College Education	0.24	(0.43)	0	1
Father has College Degree or More	0.05	(0.23)	0	1

Parents have different Education Levels	0.50	(0.50)	0	1
Number of Father's Children	2.76	(1.74)	1	16
Number of Mother's Children	2.34	(1.33)	1	10
Average State Male Wages	$690.29	($66.94)	$548.00	$860
Average State Female Wages	$548.37	($50.41)	$444.00	$671
Average TANF Benefits	$354.41	($138.69)	$185.00	$704
Mother's Annual Earnings (Lagged)	$12,203.64	($14,808.37)	0	$95,987
Father's Annual Earnings (Lagged)	$23,483.23	($22,600.72)	0	$380,000
Mother receives welfare benefits	0.39	(0.49)	0	1
CSE Index	0.29	(0.47)	-1.19	0.97
Unweighted N = 1249				

Data: FFCWS.

Table 2. Profile of Complex Families

	NO MPF		FEMALE MPF		MALE MPF	
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**
Payments (Monthly)	171.35	(230.21)	66.94	(120.07)	72.83	(127.77)
Compliance Rate (Monthly)	0.47	(0.44)	0.27	(0.40)	0.29	(0.41)
Mother's Number of Childbearing Partners	1.00	(0.00)	2.23	(0.53)	1.67	(0.71)
Father's Number of Childbearing Partners	1.00	(0.00)	1.95	(0.90)	2.36	(0.71)
Mother's Age ≤ 22	0.36	(0.48)	0.24	(0.43)	0.22	(0.41)
23 ≤ Mother's Age ≤ 40	0.63	(0.48)	0.72	(0.45)	0.75	(0.43)
Mother's Age > 40	0.02	(0.13)	0.04	(0.19)	0.03	(0.17)
Father is younger than Mother	0.11	(0.32)	0.19	(0.39)	0.12	(0.33)
Father is the same age as Mother	0.10	(0.30)	0.06	(0.24)	0.06	(0.24)
Father is older than Mother	0.79	(0.41)	0.75	(0.43)	0.81	(0.39)
Mother – White	0.39	(0.49)	0.23	(0.42)	0.22	(0.41)
Mother – Black	0.35	(0.48)	0.59	(0.49)	0.51	(0.50)
Mother – Hispanic	0.26	(0.44)	0.16	(0.36)	0.23	(0.42)
Mother – Other Race	0.00	(0.04)	0.03	(0.16)	0.04	(0.19)
Father – White	0.30	(0.46)	0.13	(0.34)	0.15	(0.36)
Father – Black	0.38	(0.49)	0.63	(0.48)	0.54	(0.50)
Father – Hispanic	0.29	(0.45)	0.16	(0.37)	0.27	(0.45)
Father – Other Race	0.03	(0.18)	0.08	(0.27)	0.04	(0.19)
Parents have different Race/Ethnicity	0.22	(0.42)	0.24	(0.43)	0.20	(0.40)
Mother is High School Dropout	0.22	(0.41)	0.45	(0.50)	0.29	(0.46)
Mother has High School Diploma	0.31	(0.46)	0.29	(0.46)	0.34	(0.47)
Mother has Some College Education	0.41	(0.49)	0.24	(0.43)	0.33	(0.47)
Mother has College Degree or More	0.06	(0.24)	0.02	(0.12)	0.04	(0.20)
Father is High School Dropout	0.29	(0.46)	0.28	(0.45)	0.25	(0.43)
Father has High School Diploma	0.27	(0.44)	0.54	(0.50)	0.48	(0.50)
Father has Some College Education	0.35	(0.48)	0.17	(0.37)	0.22	(0.42)

Father has College Degree or More	0.09	(0.28)	0.01	(0.11)	0.05	(0.21)
Parents have different Education Levels	0.50	(0.50)	0.47	(0.50)	0.51	(0.50)
Number of Father's Children	1.69	(1.15)	2.89	(1.50)	3.59	(1.68)
Number of Mother's Children	1.57	(0.95)	3.09	(1.15)	2.44	(1.36)
Average State Male Wages	695.22	(75.67)	690.73	(62.42)	687.97	(63.40)
Average State Female Wages	549.98	(53.76)	549.22	(50.96)	545.35	(47.63)
Average TANF Benefits	355.96	(144.44)	353.55	(137.12)	354.28	(134.44)
Mother's Annual Earnings (Lagged)	14,103.33	(15618.42)	10,910.02	(14,410.27)	11,998.08	(15,387.60)
Father's Annual Earnings (Lagged)	25,892.91	(23010.91)	21,363.78	(19,867.80)	21,606.45	(24,001.00)
Mother receives welfare benefits	0.20	(0.40)	0.50	(0.50)	0.46	(0.50)
CSE Index	0.28	(0.49)	0.25	(0.46)	0.35	(0.48)
Unweighted N	*319*		*643*		*743*	

Data: FFCWS

Note: Male MPF and Female MPF are not mutually exclusive categories.

Table 3. The Effect of Number of Male and Female Childbearing Partners on Child Support Outcomes

	(1)	(2)	(3)	(4)	(5)	(6)
	Child Support Payments (Monthly)			Child Support Compliance Rate (Monthly)		
VARIABLES	OLS	TOBIT	FE	OLS	TOBIT	FE
	(1)	(2)	(3)	(4)	(5)	(6)
Number of Male Partners	-17.184**	-26.522*	12.946	-0.006	-0.010	0.090**
	(7.380)	(15.034)	(11.777)	(0.019)	(0.054)	(0.042)
Number of Female Partners	-14.413**	-27.164**	-19.003**	-0.031*	-0.077*	-0.062**
	(5.811)	(12.062)	(9.120)	(0.016)	(0.046)	(0.031)
Mother's Age ≤ 22	-53.224	-85.666	98.438	-0.139*	-0.314	-0.051
	(36.089)	(59.438)	(92.524)	(0.083)	(0.212)	(0.112)
23≤ Mother's Age ≤ 40	-34.231	-35.364	99.788	-0.077	-0.110	-0.043
	(33.979)	(54.430)	(89.060)	(0.075)	(0.189)	(0.088)
Father's Age = Mother's Age	-1.947	11.315	-27.477	0.024	0.112	-0.117*
	(15.536)	(29.850)	(28.280)	(0.043)	(0.116)	(0.067)
Father's Age > Mother's Age	12.950	29.169	-7.670	0.055*	0.133	-0.065
	(11.354)	(21.822)	(32.076)	(0.030)	(0.082)	(0.063)
Mother – Black	-37.544	-47.129		-0.055	-0.104	
	(23.128)	(37.394)		(0.056)	(0.138)	
Mother – Hispanic	-41.953*	-55.827		0.000	-0.045	
	(24.829)	(37.753)		(0.055)	(0.135)	
Mother – Other Race	-11.757	-13.656		0.012	0.056	
	(47.789)	(75.231)		(0.093)	(0.250)	
Father – Black	-9.126	-11.794		-0.030	-0.073	
	(9.652)	(19.908)		(0.029)	(0.080)	
Father – Hispanic	2.369	14.578		0.041	0.096	
	(13.909)	(22.772)		(0.034)	(0.084)	
Father – Other Race	23.842	54.260		0.063	0.178	
	(38.939)	(53.194)		(0.070)	(0.147)	
Different Race/Ethnicity	24.720	19.567		0.039	0.047	
	(23.437)	(38.497)		(0.059)	(0.146)	

Mother is High School Dropout	63.832**	96.279**		0.122**	0.304**	
	(26.219)	(39.805)		(0.059)	(0.142)	
Mother has Some College	49.040	77.577		0.087	0.165	
	(36.187)	(58.608)		(0.095)	(0.228)	
College Degree or More	-5.279	-12.573		-0.034	-0.051	
	(16.233)	(27.531)		(0.043)	(0.106)	
Father is High School Dropout	-32.249***	-74.894***		-0.097***	-0.270***	
	(8.523)	(18.711)		(0.027)	(0.075)	
Father has Some College	19.427	25.392		-0.006	-0.011	
	(16.531)	(25.690)		(0.036)	(0.089)	
College Degree or More	195.046***	226.422***		0.240***	0.413***	
	(65.083)	(68.116)		(0.072)	(0.144)	
Different Education Levels	-2.298	4.786		-0.002	0.024	
	(9.662)	(17.424)		(0.024)	(0.064)	
Number of Father's Children	-3.767	-13.374**	4.603	-0.022***	-0.064***	0.014
	(2.639)	(6.056)	(5.934)	(0.007)	(0.022)	(0.023)
Number of Mother's Children	3.793	1.729	-25.609*	-0.015	-0.051	-0.113**
	(4.240)	(8.790)	(14.001)	(0.011)	(0.033)	(0.053)
Average State Male Wages	181.234*	340.530*	-454.831*	0.734***	1.606**	-0.690
	(100.115)	(185.996)	(250.474)	(0.261)	(0.704)	(0.671)
Average State Female Wages	-159.782*	-372.988**	-92.218	-0.854***	-2.213***	-0.848
	(83.306)	(165.759)	(306.918)	(0.230)	(0.655)	(0.734)
Average TANF Benefits	-5.224	-18.006	-138.327	0.010	0.007	-0.400
	(14.624)	(29.306)	(132.769)	(0.043)	(0.118)	(0.351)
Mother's Annual Earnings	0.000	0.001	0.000	-0.000	-0.000	-0.000
(Lagged)	(0.000)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)
Father's Annual Earnings	0.001**	0.001**	-0.000	0.000	0.000	0.000
(Lagged)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Mother receives welfare	-31.372***	-70.282***	11.901	-0.060**	-0.193***	0.068
	(8.616)	(18.079)	(10.597)	(0.026)	(0.071)	(0.042)
CSE Index	4.485	19.355	6.184	0.033	0.085	0.123
	(12.536)	(21.348)	(40.604)	(0.031)	(0.078)	(0.111)
Trend Variable	-8.040	-18.220	11.025	-0.058***	-0.196***	-0.034

	(7.388)	(13.322)	(20.723)	(0.019)	(0.050)	(0.053)
Observations	1249	1249	1249	1249	1249	1249
R-squared	0.148	-	0.063	0.128	-	0.187

Robust-clustered standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Notes: The *number of male partners* measures female multi-partner fertility (MPF). The *number of female partners* measures male multi-partner fertility (MPF).

Appendix A. Cobb-Douglas Utilities

No Multi-partner Fertility

<u>Mother's Utility:</u>

Max $U = U(\min\{C_1, C_2\}, X_m)$ s.t. $X_m = Y_m + S_1 + S_2 - C_1 - C_2$

Let $S_1 + S_2 = S$ and $C_1 = C_2 = C$

Then:

Max $U = U(C, X_m)$ s.t. $X_m = Y_m + S - 2C$

Define U as a Cobb-Douglas function of the form:

$U = \alpha \ln(C) + (1-\alpha)\ln(X_m)$

F.O.C.

C: $\frac{\alpha}{C} - \frac{2(1-\alpha)}{Ym+S-2C} = 0$

$C = \frac{\alpha}{2}[Y_m + S]$

<u>Father's Utility:</u>

Max $V = V(\min\{C_1, C_2\}, X_f)$ s.t. $X_f = Y_f - S$

Define V as a Cobb-Douglas function of the form:

$V = \beta \ln(C) + (1-\beta)\ln(X_f)$ s.t. $X_f = Y_f - S$

F.O.C.

S: $\frac{\beta}{\mathrm{Ym} + \mathrm{S}} - \frac{(1-\beta)}{Yf-S} = 0$

⇨ $S^* = \beta Y_f - (1-\beta)Y_m$

⇨ $C^* = \frac{\alpha}{2}\beta[Y_m + Y_f]$

Note: $S^* > 0$ and $S = 0$ if $S^* \leq 0$

Male Multi-partner Fertility

<u>Mother *j*'s Utility (j = 1, 2}:</u>

Max $U'_j = U'_j\,(C'_j, X_m)$ s.t. $X_m = Y_m + S'_j - C'_j$

Define U'_j as a Cobb-Douglas function of the form:

$U'_j = \alpha \ln (C'_j) + (1\text{-}\alpha) \ln (X_m)$ s.t. $X_m = Y_m + S'_j - C'_j$

F.O.C.

$$C'_1\text{: } \frac{\alpha}{C'j} - \frac{(1-\alpha)}{Y'm + S'j - C'j} = 0$$

$C'j = \alpha\, [Y_m + S'_j]$

<u>Father's Utility:</u>

Max $V' = V\,(\min\{C'_1, C'_2\}, X_f)$ s.t. $X_f = Y_f - S' - \lambda$ where $S' = S'_1 + S'_2$

Define V as a Cobb-Douglas function of the form:

$V = \beta \ln (C') + (1\text{-}\beta) \ln (X_f)$ s.t. $X_f = Y_f - S' - \lambda$

F.O.C.

$$S'_1\text{: } \frac{\beta}{\mathrm{Ym} + S'_1} - \frac{(1-\beta)}{Yf - S' - \lambda} = 0$$

$S'_1 = \beta[Y_f - S'_2 - \lambda] - (1\text{-}\beta)Y_m$

Therefore,

$S'_1 = S^* - \beta(S'_2 + \lambda)$ and by symmetry, $S'_2 = S^* - \beta(S'_1 + \lambda)$

⇨ $S'_1 = S^* - \beta[S^* - \beta(S'_1 + \lambda)] = (1 - \beta)\, S^* + \beta^2 S'_1 + \beta^2\lambda - \beta\lambda$

⇨ $S'_1{}^* = \frac{S* - \beta\lambda}{(1+\beta)} = S'_2{}^*$

Note: $S'_i{}^* > 0$; $S' = 0$ if $S'^* \leq 0$

$C'_1{}^* = \alpha\, \beta\, [\frac{2\,Ym + Yf - \lambda}{(1+\beta)}\,] = C'_2{}^*$

Female Multi-partner Fertility

<u>Mother's Utility:</u>

Max U = U (min{C''_1, C''_2}, X_m) s.t. $X_m = Y_m + S''_1 + S''_2 – C''_1 – C''_2$

Let $S''_1 + S''_2 = S''$ and $C''_1 = C''_2 = C''$

Then:

Max U = U(C'', X_m) s.t. $X_m = Y_m + S'' – 2C''$

Define U as a Cobb-Douglas function of the form:

$U = \alpha \ln (C'') + (1-\alpha) \ln (X_m)$

F.O.C.

C'': $\frac{\alpha}{C} – \frac{2(1-\alpha)}{Ym+S''-2C''} = 0$

$C'' = \frac{\alpha}{2}[Y_m + S'']$

<u>Father 2's Utility:</u>

Max V' = V(C''_2, X_f) s.t. $X_f = Y_f – S''_2$

Define V as a Cobb-Douglas function of the form:

$V = \beta \ln (C''_2) + (1-\beta) \ln (X_f)$ s.t. $X_f = Y_f – S''_2$

F.O.C.

S''_2: $\frac{\beta}{\mathrm{Ym} + S''} – \frac{(1-\beta)}{Yf-S''2} = 0$

$S''_2 = \beta Y_f – (1-\beta)[Y_m + S''_1]$

I. Cournot Solution:

$S''_2 = S^* - (1- \beta) S''_1$; $S''_1 = \beta S^* + (1- \beta)^2 S''_2$

Therefore, $S''^*_1 = \frac{S*}{(2-\beta)} = S''^*_2$

$S''^* = \frac{2S*}{(2-\beta)} > S^*$ Note: $S''^* > 0$; $S'' = 0$ if $S''^* \leq 0$

and $C''^{*} = \frac{\alpha\beta}{2}[\frac{Ym+2\,Yf}{(2-\beta)}]$

II. Stackelberg Solution:

Let Father 2 be the follower and Father 1 the leader in the Stackelberg Model.

Define $S''_2 = S^* - (1-\beta)\,S''_1$ (A)

Plug (A) into $C''_1 = \frac{\alpha}{2}[Y_m + S''] = \frac{\alpha}{2}[Y_m + S^* - (1-\beta)\,S''_1 + S''_1] = \frac{\alpha}{2}[Y_m + S^* + \beta\,S''_1]$

<u>Father 1's Utility:</u>

Max $V' = V(C''_1, X_f)$ s.t. $X_f = Y_f - S''_1$

Define V as a Cobb-Douglas function of the form:

$V = \beta \ln(C''_1) + (1-\beta)\ln(X_f)$ s.t. $X_f = Y_f - S''_1$

F.O.C.

S''_1: $\frac{\beta 2}{Ym + S* + \beta S''1} - \frac{(1-\beta)}{Yf - S''1} = 0$

⇨ $S''_1{}^* = \beta\,Y_f - (1-\beta)\,[Y_m + Y_f] = S^* - (1-\beta)\,Y_f$

Plug $S''_1{}^*$ back into (A):

⇨ $S''_2{}^* = \beta\,S^* + (1-\beta)^2\,Y_f$

Therefore, $S''^* = S''_1{}^* + S''_2{}^* = (1+\beta)\,S^* - (1-\beta)\,\beta\,Y_f$

As such,

$S''^* = S^*$ ➔ $\frac{\beta}{(1-\beta)} = \frac{Ym+Yf}{Yf}$;

$S''^* > S^*$ ➔ $\frac{\beta}{(1-\beta)} > \frac{Ym+Yf}{Yf}$;

$S''^* < S^*$ ➔ $\frac{\beta}{(1-\beta)} < \frac{Ym+Yf}{Yf}$

Note: $S''^* > 0$; $S'' = 0$ if $S''^* \leq 0$

and $C''^* = \frac{\alpha\beta^2}{2}\,[Y_m + 2\,Y_f]$