THE IMPACT OF ECONOMIC RESOURCES ON PROMARITAL CHILDBEARING AND SUBSEQUENT MARRIAGE AMONG YOUNG AMERICAN WOMEN*

This paper extends previous work on premarital childbearing by modeling both the entry rates and the exit rates of unwed motherhood among young American women. In particular, I investigate the impact of economic resources on the likelihood of experiencing a premarital birth and then of subsequent marriage. Using a multiple-destination, multiple-spell hazard regression model and a microsimulation analysis, I analYze the accumulating effects of various economic variables. The results show that the economic resources are indeed important both for premarital childbearing and for subsequent marriage. However, the simulations show that large changes in these economic variables do not necessarily translate into large changes in nonmarital childbearing.

Over the last three decades, family-formation behavior among young adults in the United States has changed dramatically. An important dimension of this changing pattern is the sharp increase in the proportion of children living in single-parent families, which is due to the steep rise in marital dissolution as well as the rise in out-of-wedlock childbearing. In 1998 as many as 10% of all children lived in single-headed families in which the mother had never been married, a number that constitutes around 40% of all children living in single-headed families (Willis 1999). Another troubling issue is that a relatively large proportion of couples with a premarital birth remain unmarried for relatively long periods, and in many cases, the biological parents never marry; Brien (1997) showed, however, that these findings vary substantially by race. Among African Americans, for instance, only 26% of women who experienced an out-of-wedlock birth married the biological father within three years of the birth. Among white women, on the other hand, the equivalent figure is 78%; the figure is around 40% for Hispanic women.

These changes in household formation have important policy implications. There is a serious concern over the retreat from the traditional pattern of family formation. In particular, single-parent families are associated with a higher incidence of poverty and welfare dependency. For instance, children of adolescent mothers, who represent a large proportion of those experiencing premarital childbearing, are more likely to suffer bad health, are more likely to grow up in poverty, tend to perform significantly worse at school, and are more likely to suffer abuse and neglect; and daughters of adolescent mothers are themselves considerably more likely to have children before age 18 (Haveman and Wolfe 1994; Korenman, Miller, and Sjaastad 1995; McLanahan and Sandefur 1995). Recent figures published by Child Trends (2002) showed that nonmarital childbearing among teenagers has declined since the 1990s, but that nonmarital chilbearing among women in their 20s has actually increased. The nonmarital birth rate for women aged 20 to 24 rose from 70.7 per 1,000 births in 1996 to 74.5 in 2000; for women aged 25 to 29, the figures were 58.2 to 62.2 births per 1,000 births.

There is now a quite substantial literature investigating the determinants of premarital childbearing (see Wu and Wolfe 2002 for an excellent contribution to this literature). A

common approach in this line of research is to use a hazard regression framework, often in discrete time, where the event of interest is a premarital birth. The process of entry, however, represents only a partial picture of the issue of premarital childbearing. Relatively little attention has been devoted to the process of exiting single motherhood through marriage. This is unfortunate because the exit rate to marriage is a crucial determinant of whether out-of-wedlock childbearing represents a social problem. Whereas much effort has been devoted to analyzing how economic incentives affect the likelihood of experiencing premarital childbearing, no study has considered how economic factors may affect the process of exiting this state through marriage. A possible reason why no study has tackled the problem is that exiting the state of premarital childbearing is not necessarily easy: any economic variables that affect the exit rate through marriage will, at the same time, affect the entry rates into premarital childbearing. Thus, to assess the overall impact of economic resources, one must model the exit rate explicitly together with the entry rate.

In this article, I aim to bridge this gap in the literature by extending the standard approach of hazard regression into a framework that incorporates the processes of entering and exiting the state of unwed motherhood. I accomplish this by implementing a multiple--destination, multiple-spell model. I focus on three sources of income: (1) own personal earnings; (2) family resources; and (3) state welfare support. These variables, along with a range of background variables, are included as regressors in the hazard regression model. Although multiple-spell models are not uncommon in the demographic literature, none has used the framework to analyze the accumulating effects of economic variables on entering and exiting the state of nonmarital motherhood caused by premarital childbearing. It is clear that the economic variables might have quite different and opposing effects on the entry rate than on the exit rate. Consequently, any interpretation of the overall effects based on the parameter estimates alone will be difficult. Thus, I make extensive use of simulations, enabling me to make statements regarding the effect of economic variables on both the proportions entering and exiting and the mean time spent as a nonmarried mother.

BACKGROUND AND PREVIOUS RESEARCH

The economic literature on premarital childbearing has often emphasized the importance of incentive structures on individuals' decision-making. In general, economic theory defines the relationship between economic resources and family-formation behavior as being rather complex. This is particularly the case for out-of-wedlock childbearing because it is not only a particular aspect of fertility behavior but also a crucial part of the marriage-- formation process. Thus, theories attempting to explain the role of economic resources in out-of-wedlock childbearing must take both aspects into account (Willis 1999). Here I consider the potential impact of these sources of income in this context.

The Potential Impact of Various Income Sources

Personal income. In the simple economic setting, marital fertility is explained in terms of opportunity costs of children and child quality (Becker 1965; Becker and Lewis 1973).

Assuming that child quality is exogenous, the basic economic framework predicts that increased levels of personal resources, normally measured in terms of labor earnings, reduce the demand for children.' Search models of marriage formation predict that high personal earnings increase a person's marriage prospects and, therefore, reduce the risk of having children outside of marriage; this result can be thought of as a good-catch effect. On the other hand, women might become more selective if they realize that they are attractive in the marriage market, thereby reducing their probability of marriage. Thus, search models suggest that wages have an ambiguous effect on marriage.

High personal earnings are likely to reduce the importance of parental support and the income normally received from a spouse within marriage. This self-reliance effect (Aassve et al. 2002), also referred to as an independence effect in the sociology literature, predicts that young women are more likely to leave the parental home as their income increases and that marriage becomes less important as an institution to start their own family. The latter effect highlights the important role of the spouse's earnings potential in the marriage-formation process. Willis (1999) showed, for instance, that women might consider out-of-wedlock childbearing more beneficial than marital childbearing if their income is high enough to rear children with their own resources.2

Welfare. An issue that has received considerable attention recently is the alleged effect of generous welfare schemes on out-of-wedlock childbearing among young women. It is often claimed that welfare benefits, normally biased in favor of single-- headed, low-income families with dependent children, tend to induce out-of-wedlock childbearing (e.g., Becker 1991; Rosenzweig 1999). Thus, entering parenthood at an early age, and possibly before marriage, might be considered more attractive to women with limited future economic prospects owing to social exclusion and discrimination. The central problem in measuring the impact of welfare benefits is that the state level of welfare might be set endogenously by the authorities: differences in states' welfare generosity are, at least to some extent, likely to serve as an indicator of fundamental differences in states' attitudes toward out-of-wedlock childbearing. Thus, a positive relationship between welfare generosity and out-of-wedlock childbearing might reflect the authorities' responses to high rates of premarital childbearing rather than young women's responses to the states' levels of generosity.

Parental Income. Parents are likely to be an important source of financial support in the early years of adulthood (Goldscheider and Goldscheider 1999). From an economic point of view, I would expect high levels of parental income to be negatively associated with out-of-wedlock childbearing. In terms of young adults leaving the parental home, which is linked to both the timing of marriage and fertility, I expect high levels of parental resources to increase the utility associated with living in the parental home. Thus, all else being equal, high levels of parental resources make one's own family formation less attractive.

Search and matching models of marriage, however, predict that a high level of parental resources signal, at least in part, the quality of the young individual as a marriage partner.

Thus, a high level of parental resources will increase the marriage-offer rate, which, in turn, will make marriage more likely and, hence, premarital childbearing less likely.

In sum, because high parental income encourages young adults to remain in the parental home, it has a negative effect on both marriage and premarital childbearing. At the same time, high parental income has an opposing, positive effect on marriage because it indicates a high-quality potential marriage partner. Therefore, I would expect the net negative effect from high levels of family income to be stronger for premarital childbearing than for marriage.3

Economic Approach to Explain Premarital Childbearing

Relatively few empirical studies take an economic approach to explain premarital childbearing. However, these studies are of particular relevance to the study presented here.4

First, Duncan and Hoffman (1990) used data on 874 young African American women from the 1985 file of the PSID to estimate a two-stage logit model of the probability of having a teenage premarital birth. Young women were assumed to compare income expectations with alternative childbearing choices. As a measure of these income expectations, they used the maximum state AFDC benefits in case of a birth, and family income at age 26 without a birth. Although the effects of these income sources were of the expected sign, they were generally weak and insignificant, perhaps because of the researchers' rather crude measure of economic opportunities.

Second, Lundberg and Plotnick (1995) used the NLSY to estimate a three-stage logit model of (1) experiencing a premarital pregnancy, (2) the pregnancy resolution, and (3) the occurrence of marriage before childbearing. They found a relatively strong positive association between the level of welfare benefits (measured by the state welfare guarantee: AFDC and food stamps together) and the incidence of premarital childbearing for white women, but no strong effect among African American women.

Third, An, Haveman, and Wolfe (1993), using PSID data from 1987, found that the mother's education, which was positively associated with the offspring's educational level and future earnings, was negatively associated with premarital childbearing. However, they found no strong link between mother's education and the welfare-benefit level.

Finally, Wolfe, Wilson, and Haveman (2001), using data from the PSID, predicted income streams for those who had a premarital birth and those who did not. In both cases, incomes were predicted from a cohort older than the primary sample, invoking the assumption that young women form their expectations regarding the effects of alternative childbearing choices by observing the choice-conditioned outcomes and experiences of the older cohort. An important benefit of this approach is that the income used as an explanatory variable is conditional on the choice of having experienced a premarital birth, but is still exogenous to the event of interest. They found that young women

respond to economic incentives, implying that high costs of premarital childbearing lower the rate of experiencing this event.5

Welfare Benefits and Premarital Childbearing

There is a quite extensive empirical literature on the alleged effect of the level of welfare benefits on premarital childbearing. The most influential study is by Moffitt (1992, 1994), who comprehensively studied the effect of the welfare system on marriage and premarital childbearing. He found a positive association between the level of welfare and the incidence of out-of-wedlock childbearing, but the effect was generally weak.

More recent studies-notably, those by Rosenzweig (1999), who used data from the NLSY, and by Hoffman and Foster (2000), with data from the PSID-found stronger effects of welfare benefits on the prevalence of premarital childbearing. Rosenzweig specified a model of three marriage and fertility outcomes that are linked to future expectations about the economic opportunities associated with these states. Overall, he found the effect of welfare benefits to be strong once state fixed effects were controlled, a result that is confirmed by the findings of Hoffman and Foster.

Partnership Formation After Premarital Births

Of interest for this paper are studies that have considered partnership formation after an out-of-wedlock birth. In one of the few studies to do so, Rendall (1999) used PSID data from 1968 to 1996 to analyze the prevalence of single motherhood in terms of entry and exit rates. Estimating a Markov model from age-standardized transition probabilities, he decomposed the prevalence of premarital childbearing in 1996 in terms of the entry and exit rates. Although he did not include contextual covariates in the analysis, his study highlights the importance of accounting for the exit rate when considering the overall prevalence of single motherhood. Rendall concluded that higher initial entry rates among African American women than among white women accounted for about half of the difference between these two groups in the prevalence of single motherhood; the remaining difference was due to much lower exit rates and higher dissolution rates of later unions among African American women.

Roempke Graefe and Lichter (1999) considered children's life-course transitions from single mother-headed families to cohabiting families versus to married-couple families. They used data from the NLSY, merged with the child-mother file that provided background information on both the mother's and the children's characteristics. They found that transitions to cohabitation are negatively associated with the child's age, the number of children in the household, mother's age and education, AFDC receipts, and place of residence (living in the South). For the marriage transition, education has a positive effect. Household income has a positive effect with respect to marriage, but a negative effect with respect to cohabitation.

Upchurch, Lillard, and Panis (2002) used the NLSY to estimate a model of education, nonmarital and marital fertility, marriage, and marriage dissolution as simultaneous

processes. Accounting for the endogeneity of these processes, they showed that a current pregnancy has a strong impact on marriage, but that if the pregnancy does not lead immediately to a marriage, the marriage rate is actually lower.

In general, previous work seems to indicate that economic incentive structures influence young women's fertility choices. The literature is not clear, however, regarding the extent to which economic factors can explain the magnitude of nonmarital childbearing. Most studies have concentrated only on the entry rate, thereby ignoring the crucial issue of what happens once a premarital birth takes place. In addition, many studies focusing on the effect of welfare benefits have ignored the effect of other economic variables. In this study, I address these shortcomings by developing a more sophisticated model of young women's family-formation behaviors, to which I now turn.

DATA AND EMPIRICAL SPECIFICATION

Model Specification

The model is a hazard regression model with multiple spells and multiple destinations. The specification is essentially of the type described in van den Berg (2000) and recognizes, to a large extent, that marriage and fertility transitions are interrelated dimensions of a joint family-formation process. Figure 1 outlines the structure of the econometric model and lists the various family statuses a woman can occupy.

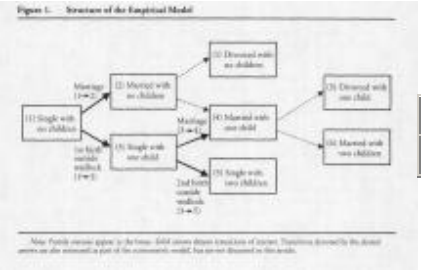

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Figure 1.

All women start the family-formation process as single without children, which is denoted as family status 1. They either marry to obtain family status 2 or have a child before marriage to obtain family status 3. An unmarried mother (status 3) can marry, obtaining family status 4; have a second child outside marriage, which is given as family status 5; or continue her nonmarital status until the censoring date. The transitions of interests are marriage before childbearing (denoted as 1-->2), a first premarital birth (denoted as 1-->3), marriage after childbearing (denoted as 3-->4), and a second birth outside marriage (denoted as 3-->5). As is clear from Figure 1, the framework also includes estimation of marital fertility transitions (denoted as transitions 2-->4 and 4-->6) and marital dissolution (denoted as transitions 2-->1 and 4-->3). These estimates are not discussed in the present paper but are available on request.6

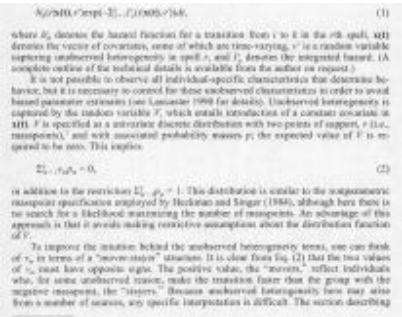
Although this specification is powerful, some shortcomings remain. The first issue concerns the competing-risk assumption of the alternative destination states. It is likely that marriage-formation and fertility decisions, at least to a certain degree, are made jointly (e.g., Willis 1999) and therefore will be correlated. A possible solution to this problem is to specify a system of simultaneous hazard equations. The advantage of this approach, which is becoming more widespread (e.g., Brien et al. 1999; Upchurch et al. 2002), is that the potential correlation between the equation-specific error terms can be estimated quite easily, ensuring unbiased estimates of the parameters of interest. However, the approach does not make simulations easy, a disadvantage that influenced my decision not to opt for this approach.

The second caveat concerns the omission of cohabitation as a separate destination state. The central question here is how cohabitation should be treated compared with marriage. Manning's (1993) findings suggest that, for whites, cohabitation acts as a prelude to marriage: pregnant cohabitors have a higher marriage rate than single women who are pregnant. For African American women, on the other hand, she suggested that cohabiting unions tend to act as an alternative to marriage (see also Manning and Smock 1995).

More recent research (e.g., Bumpass and Lu 2000; Raley 2001) has suggested that cohabitation is becoming a more accepted form of living arrangement and that the timing and the type of union are playing less of a role in terms of fertility. Furthermore, this research has shown that the increase in nonmarital childbearing during the 1990s was due mainly to a rise in cohabitation. Clearly, if this trend persists, future research of this sort must account for cohabitation more carefully.

Extending the multispell model to include cohabitation as a separate destination state is not trivial. At each node not starting in marriage (assuming that cohabitation is not an option if already married), an extra destination state would have to be defined. Given the already complex nature of the model, and the still unclear role of cohabitation during the survey period, I did not undertake this extension.

In this model the probability of making a transition from a family status i to family status k is expressed as



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Data

I used data from the National Longitudinal Survey of Youth (NLSY). The sample contains 3,7158 women followed from 1979 to 1992, with an age range of 14 to 20 years when first interviewed in 1979. The data reveal racial differences in patterns of the family-- formation process (Table 1). African American women marry later than both Hispanic and white women, and Hispanic women marry at an earlier age than white women. African American women have a first premarital birth at a younger age than the other racial groups. For a second premarital birth, there is no great difference between Hispanic and African American women. On average, childbearing within marriage takes place three years later than childbearing outside marriage, and the birth of a second child within marriage takes place 1.7 years after the first birth.

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Table 1.

Every woman in the sample is recorded with a "transition history," which is defined over the family states and the durations between the family-formation events. Table 2 shows the frequency distribution of these transition types for the sample. The most common form of family-formation sequence is marriage followed by a first and second child (this sequence is denoted as 12-4-6), and as many as 27.9% of our sample experienced this sequence. The percentage of the sample without any transitions is 13.8%. A large percentage of women in the sample are right-censored: only 50.8% reach the "absorbing" states of having two children (state 5 or state 6); 10.8% get married but have no children (history type 1.2); 10.1% are censored when they are married and have one child (124); 5.2% are censored as unmarried with one child (1.3); and 11.8% are censored as unmarried with two children (1-3.5).

The transition-type frequencies vary substantially between the three racial groups: 11.4% of African American women have transition history 1.3, whereas only 2.2% of whites do. African American women are less likely than white or Hispanic women to marry before a first childbirth. Transition types 1.3.5 and 1.2.4.6 are those with the most dramatic differences: 31.1% of African American women have both first and second children out-of-wedlock, whereas only 3.6% of white women do. Only 11% of African American

women undertake the most common route of 1.2.4.6, compared with 33.2% for white women and 36.1% for Hispanic women.

Covariates

An important methodological issue is that many of the economic explanatory variables are endogenous with respect to the family-formation transitions. For instance, one might expect the level of earnings to be negatively associated with the rate of premarital childbearing. If so, one might argue that women with low earnings are more likely to have children outside marriage. On the other hand, women will necessarily have a lower income if they choose to have children, implying that low earnings are a result of having children, rather than the other way around. This example highlights the need to ensure that the covariates used in the analysis are exogenous with respect to the events under study. This is also crucial for the microsimulations. Clearly, a parameter estimated on the basis of an endogenous variable will itself be endogenous when policy experiments are performed through simulations.

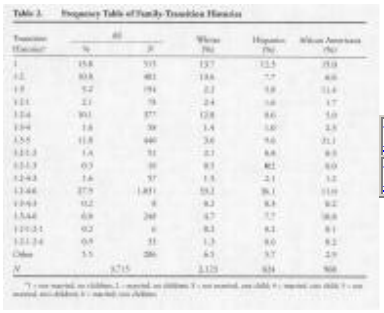

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Table 2.

As an exogenous measure of a woman's earnings capacity, I constructed her predicted wage rate (see Mincer 1974 for details), which essentially is the average wage of women with similar characteristics. This measure is supposed to capture women's perceived opportunity costs of having children, as well as their position in the marriage market. Because the size of the NLSY sample is relatively modest, I used data from the Current Population Survey (CPS).9 Applying a two-step procedure to control for self-selection into the labor force produces results that conform well to the literature: women with higher education or who live in urban areas tend to have higher participation rates; African American women have slightly lower participation rates; and current enrollment in a school or university has a strong negative impact on participation. Individual wage levels are positively associated with age, but at a declining rate. Living in an urban area is associated with higher wages, whereas the positive impact of education is within the standard range reported in the literature. African American women generally have lower wages than both Hispanic and white women.

Parental resources were measured by the predicted family income, which I constructed by estimating an OLS regression of parental income in 1979 minus the income of the

respondent. The regression is based on respondents still living in the parental home in 1979. These results also conform to my expectations. Age is positively associated with family income, but at a declining rate. Parents' educational level, work status, and residing in an urban area are positively associated with family income, whereas there is a negative relationship between family income and the timing of the mother's family-formation process, which is measured by whether the mother had a first birth as a teenager.

Caution is needed when interpreting the impact of family income on the family transitions. One issue concerns the intergenerational effects through norms in terms of work and educational choice, which will affect the offsprings' own family-formation behavior. Another issue concerns the financial aspect associated with family income. Transfers from parents to their offspring might not be a simple linear function of the level of family income. As Rosensweig and Wolpin (1993) showed, the actual amount of these transfers tends to depend upon on the financial need of the offspring. Consequently, the amount of the transfers might be influenced by the offspring's behavior. For instance, a higher need is apparent if a daughter has a child outside marriage.

The respondent's educational attainment and enrollment were not included as covariates because these are likely to be endogenous to the family-formation events (see, for example, Sander 1992). For instance, women who marry or have a child early in life may terminate their education in response to this event. As an alternative, I used the woman's AFQT (Armed Forces Qualification Test") score, which is positively correlated with the number of years spent in education (e.g., Cameron and Heckman 1999) but has a higher degree of exogeneity with respect to her family-formation choices. Given the positive correlation with the time spent in education, I expect high levels of AFQT to have a delaying effect on marriage, and possibly a negative effect on premarital childbearing. The AFQT is age adjusted; thus linear age effects are removed. Because the women in my sample were 15 to 21 years old when they took the test in 1980, however, school attendance might have affected the achieved scores, especially for the oldest women.

I also included a dummy variable indicating whether the woman lived with both parents at age 14. Finally, I included the duration until first birth as a covariate in the family transitions taking place after a premarital birth. This variable plays an important role in the simulations because the effects of the income variables on the initial family transitions will affect its values and, therefore, will affect subsequent transitions.

As did many previous studies, I used cross-state variation in AFDC-guarantee levels as a measure of how young women perceive the level of public support in the state where they reside. It was implemented as a covariate that is non-time varying and refers to the AFDC guarantee for a two-person family when the respondents were age 20. It would be desirable to use AFDC levels that could be matched to the women when they were younger, but this is difficult because no retrospective information regarding their place of residence is given. Thus, it is not possible to assign women with AFDC levels before 1979. The lack of retrospective information also makes it difficult to implement welfare benefits as a time-varying variable.

An implication of using a time-constant measure is that one is unable to identify young mothers who would move to different states in order to obtain higher levels of welfare benefits. The literature, however, does not seem to support that this is a widespread phenomenon (see, for instance, Zimmerman and Levine (1999), who investigated the issue with data from the NLSY).

Another argument against using a time-constant measure is that it does not capture changes in welfare levels over time. During the years 1979 to 1992, however, the within--state levels did not change dramatically (e.g., Moffitt 2000); thus it is unlikely that the incentive structure of AFDC changed in any significant way.lI

Controlling for area-specific effects by regressing on state dummy variables is not easy in this econometric framework because it requires sets of dummy variables in each spell and for each destination state, which increases the parameter space dramatically. Instead I used the county marriage rate, which can be seen as a proxy for mate availability in the local marriage market. South (1996), who used the NLSY and a competing-risk framework of marriage and premarital childbearing as alternative destinations, found that mate availability is positively associated with marriage and that, for white women, it also increases the risk of premarital childbearing. Based on his findings, I generally expect high marriage rates to be positively associated with both entry into marriage and premarital childbearing.

RESULTS

The results of the estimates are reported in Table 3.11 I consider differences between the three race groups first.

Not unexpected, the results reveal a quite diverse pattern. The most noticeable difference, and consistent with previous findings (e.g., Brien 1997; Manning and Landale 1996), is the high rate of premarital childbearing and a low rate of marriage among African American women (left panel of Table 3). Compared with Hispanic women, white women are more likely to marry and less likely to have a premarital birth; here, the difference is considerably smaller than that between African American and white women, but it is still significant.

As shown in the right panel of Table 3, the differences persists in terms of the exit rate: African American women are considerably less likely to marry (transition 3-4) after a premarital birth. They also have a higher rate of second childbearing outside marriage, although here the coefficient is not significant at the 5% level. The difference between white and Hispanic women is small once a premarital birth has taken place, in terms of both marriage rates and having a second child. These patterns are in line with Rendall's (1999) findings, although my results indicate a stronger role for the entry rate in explaining the racial differences in unwed motherhood. This discrepancy is likely due to the fact that my model is estimated based on a sample of very young women who have not completed their family histories.

Consistent with previous work (e.g., Cooksey 1990; Wu and Martinson 1993), I found women growing up in a single-parent family to have a higher rate of entering unwed motherhood (left panel). In terms of entry into marriage, the effect is negligible. Family background was not included in the subsequent transitions because earlier runs of the model showed no effects. Thus, unstable family background seems to have an effect on experiencing premarital childbearing, but not on subsequent marriage.

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Table 3.

The instrumental variable concerning education and school ability, the AFQT score, produces parameter estimates of the expected sign. High AFQT scores are negatively associated with both having a premarital birth and entry into marriage (left panel, Table 3). Thus, high-ability women appear to delay the family-formation process, possibly as a result of spending a longer time in school. The AFQT coefficient in the right panel (i.e., transitions after premarital childbearing) is in the expected direction. Women with high scores are more likely to marry, whereas those with a low score are more likely to have a second child outside marriage. However, the parameters are not particularly large, and those for the exit rates are not even statistically significant.

I now turn to the effects of the income variables. The left panel in Table 3 reveals that high levels of predicted wages have a negative effect on the rate of marriage and unwed motherhood, and both are of similar magnitude. The negative effect on marriage could be interpreted in various ways. A likely driving factor is the education variable in the wage equation. Women who stay in school longer will have higher expected earnings and, therefore, will be less reliant on any financial support provided by a prospective spouse (the self-reliance effect). Of course, the economic viewpoint also stresses the importance of the good-catch effect-that is, that high-earning women are considered to be good marriage partners and therefore are likely to receive more marriage offers. Interpreted in

this way, my results suggest that the self-reliance effect dominates any good-catch effects. The negative effect of predicted wages on premarital childbearing indicates that the perceived opportunity costs of children is important: those with high expected earnings perceive the cost of children to be high and, consequently, are less likely to have children outside marriage. The negative effect of predicted wage on premarital childbearing is in line with previous findings (Lundberg and Plotnick 1995; Wolfe et al. 2001). However, that predicted wages are negatively associated with both destinations (marriage and premarital childbearing) and are of the same magnitude is important: the wage level will have offsetting effects on marriage and out-of-wedlock childbearing.

As shown in the right panel of Table 3, the effect of the predicted wage changes notably once a premarital birth has taken place: marriage is now positively associated with the wage level. An economic interpretation is that women evaluate the benefit of marriage more favorably once a premarital birth has taken place and therefore will intensify their efforts in finding a marriage partner, possibly reducing the quality threshold at which they are willing to accept a marriage offer. Interpreted in terms of the self-reliance and good-- catch effects, the positive coefficient suggests that the latter now dominates. Because of the added cost of rearing a child, the self-reliance effect is naturally weakened. Of course, many women having a premarital birth are already in stable partnerships, possibly in cohabiting unions. As such, the positive coefficient could also reflect a stronger norm toward legitimizing the child through marriage among women in the higher earnings brackets.

The impact of predicted wages on a second premarital birth is now strongly negative. The coefficient is more than twice as large as that in the transition to first premarital childbearing, indicating that the overall effect of earnings is much more pronounced once women have entered unwed motherhood. Part of this effect is explained by the general low earnings among African American women, who are also more likely to have children outside marriage.13

I found quite different effects of family income on entry and exit. Considering the entry rate (left panel), I found that women from high-income families have lower rates of marriage and premarital childbearing. In line with my expectations, the effect is stronger for the latter. The interpretation of the effects of family income is not necessarily straightforward because it comprises several dimensions. One factor is the financial aspect associated with high family income. For example, economic theory would predict that young women will stay at home longer and will be less likely to start their own families if the financial benefit of staying at home is high. This argument is consistent with the negative impact reported here. Another factor concerns intergenerational effects: family income is positively related to parents' education and work careers, whereas it is negatively associated with the mother's timing of childbearing. These behavioral patterns of the parents will necessarily influence the offspring's behavior, both in terms of educational choice and work, and therefore their attitudes toward their own family-formation decisions. The negative impact of family income is certainly consistent with this view (e.g., Rosenzweig 1999). Once a premarital birth has taken place (right panel) family income no longer has a negative impact on marriage. Women from low-income

families have a higher likelihood of experiencing a second premarital birth. However, the coefficient is smaller than that for the transition to first premarital childbearing, indicating that family income does not play an equally important role once the first birth has occurred.

Finally, in terms of the AFDC levels, my estimates suggest that women residing in states with high welfare levels have higher rates of premarital childbearing and lower rates of marriage. The coefficients associated with the county marriage rates are positive and significant for both the marriage and the out-of-wedlock birth transitions: women living in areas with high marriage rates are themselves more likely to marry and to bear children outside marriage (left panel). Excluding the county marriage rates (not shown here) lowers the impact of the AFDC parameters slightly, an effect that is consistent with the findings of Rosenzweig (1999) and Hoffman and Foster (2000).

In terms of exiting the state of unwed motherhood (right panel), the effect of welfare benefits is considerably smaller, both for experiencing a second birth outside marriage and for entering marriage. Although the coefficients are of the expected sign, the result suggests that there is little impact of welfare benefits once a premarital birth has taken place. Thus welfare benefits seem to affect predominantly the entry rates.

The interpretation of the masspoints, of course, is difficult, and any explanation is merely tentative. Often unobserved heterogeneity is interpreted as differences in family orientation. Thus women with a strong orientation toward family life generally are more likely to marry or to have children. In this setting, those women would be associated with the positive masspoint. The group with a negative masspoint would be women who value independence or have a strong orientation toward careers; these women have a lower rate of marriage and childbearing. It is also possible that the masspoints somewhat reflect my omission of cohabitation as a separate destination state (see previous section). The positive masspoint (the "movers") might reflect couples who consider cohabitation a prelude to marriage and therefore have strong intentions of marrying. If so, then I might expect a premarital pregnancy to accelerate the marriage transition (e.g., Upchurch et al. 1999; Manning and Landale 1996). The negative masspoint (the "stayers"), on the other hand, might reflect women in less stable partnerships or women who consider cohabitation an alternative to marriage and, as a consequence, are less likely to marry even if they have a premarital birth.

In the first set of transitions, I found that 77.8% of the sample is characterized by a positive masspoint of around 0.5, whereas the remaining 22.2% are assigned a large negative masspoint of -1.74. After a premarital birth has taken place, the percentages of movers and stayers, respectively, are 38.3% and 61.7%, with masspoints of 1.98 and -1.23.

RESULTS FROM MICROSIMULATIONS

The highly complex nature of my model implies that the parameter estimates alone are not necessarily informative if the interest lies in assessing the overall effect on premarital

childbearing and subsequent marriage. For instance, suppose one is interested in the effect of a 30% reduction in welfare benefits. The effect is hard to quantify, not only because welfare benefits affect the entry and exit rates at the same time, but also because they affect entry into the alternative destination states differently. Providing predictions of the overall effects, however, is of key interest because it informs us about the effectiveness of possible policy interventions. Furthermore, it enables an assessment of the extent to which economic factors can explain a phenomenon such as out-of-wedlock childbearing.

In this section, I make use of simulations to understand more fully the overall effects of these economic variables. I concentrate on four key statistics: (1) the percentage of first out-of-wedlock births based on the total number women in the sample; (2) the percentage of women marrying after having experienced a premarital birth; (3) the percentage of second out-of-wedlock births based on the total number of second births; and (4) the mean time spent as an unwed mother. The statistics are derived from simulating synthetic transition histories from the inverted survival function(s), using different values of predicted wages, predicted family income, and the level of welfare benefits (AFDC). The simulation sample was based on the original NLSY sample of women used for the estimation, and five replications were made in order to ensure a sufficient sample size (N= 3,715 x 5 = 18,575). The censoring date from the original sample was maintained throughout all simulations (i.e., the women's age in 1992).

The simulation results are presented in Tables 4 and 5. The first two columns indicate the level of the income variables. A value of -0.60 implies that the original level has been reduced by 60%, whereas +0.60 means that 60% has been added to the original level. Consequently, the row entry in which both income levels are zero refers to the original level as given by the sample data.14

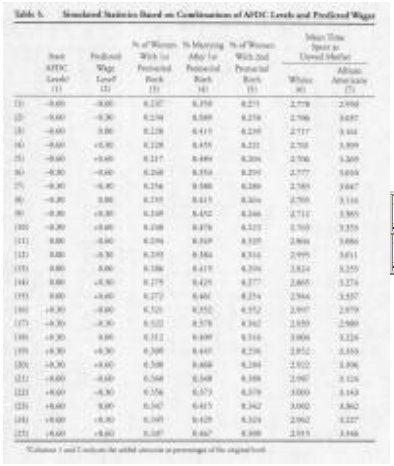
Column 3 in Table 4 shows how the proportion of women having their first birth outside marriage varies with different levels of predicted wages and family income. It is not surprising that the effect of changing the predicted wage levels is remarkably small. The negative predicted wage parameter is of roughly the same magnitude for premarital childbearing and marriage. As the predicted wage level is increased, fewer women experience out-of-wedlock childbearing. At the same time, fewer women marry, increasing the proportion of women being at risk of having a birth outside marriage. Thus, wages have offsetting effects on marriage and premarital childbearing, a feature that results in only a small net effect. The predicted family income is negatively associated with both entering marriage and premarital childbearing, but the coefficient associated with the latter is considerably stronger. Thus, I find that any changes in the predicted family income dominate any effects from the predicted wage level.

Column 3 in Table 5 demonstrates the effect of changes in the AFDC level on the rate of first out-of-wedlock childbearing. As expected, low levels of welfare are associated with lower rates of premarital childbearing, whereas the effect of predicted wages remains negligible. At the original level of predicted wages and AFDC (row 13), 28.6% of women experience an out-of-wedlock birth. Reducing AFDC by 60% but keeping the

original wage level (row 3) brings the percentage down to 22.8%. Increasing the AFDC level by the same amount produces a rate of 34.7% (row 23). But these changes are not particularly large, suggesting that substantial changes in welfare benefits do not necessarily translate into large changes in the rate of premarital childbearing. Certainly, the effect is smaller than that found by Rosenzweig (1999) and Hoffman and Foster (2000). For instance, Rosenzweig found that a 37% decline in AFDC levels translates to a 30% drop in nonmarital births; Hoffman and Foster reported that a 25% increase in AFDC levels increases the percentage of women with an early nonmarital birth by more than 30%. In my model, achieving these effects would require a much larger change in the AFDC levels. It is not entirely clear what drives this discrepancy. An interesting finding from the work by Hoffmann and Foster, however, is that the level of AFDC did not appear to have any effect when their sample included only teenagers, whereas the effect of AFDC was large when the sample only included 20- to 22 year olds. Thus, it is possible that dividing the sample of women into those who had a premarital birth before age 20 and those who did so after age 20 would produce different estimates of the impact of AFDC. The model used here, however, is quite different from that adopted by Rosenzweig (1999) and Hoffman and Foster (2000). They based their analyses on a multinomial choice specification, whereas I adopted a continuous-time hazard model using the exact timing of births and marriages. As such, the present framework provides a more exact specification of young women's behavior, possibly driving some of the discrepancy. Finally, Hoffmann and Foster emphasized the sensitivity of the specification of state fixed effects. It is possible that my use of the county marriage rate cannot adequately capture these fixed effects.

Enlarge 200%
Enlarge 400%

Table 4.



Enlarge 200%
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Table 5.

The fourth column of Table 4 shows the percentage of women marrying after they experienced a premarital birth. Here there is a much more pronounced role of predicted wages. Given the results shown in Table 3, this finding is not surprising. The effect of predicted wages is not only positive in the marriage transitions; it is also strongly negative in experiencing a second out-of-wedlock birth. Thus, as the predicted wage level is increased, fewer women have a premarital birth, increasing the number of women at risk of marrying. Although the predicted family income has a weak positive impact on marriage in the estimation, the simulations actually produce a weak negative impact as family income is increased. This is because increasing family income reduces the number of premarital births and increases the mean duration until first childbearing. Important here is that the duration until first childbirth has a negative impact on marriage after a premarital birth, and this effect dominates the direct positive effect of family income.

As for welfare benefits, the fourth column in Table 5 reveals that there is hardly any impact on the marriage rate. This is consistent with its small coefficients reported in Table 3.

The fifth column in Table 4 shows the percentages of second births being out-ofwedlock by family income and wages. The percentages are based on the total number of simulated second births (including births within marriage). The combination of high predicted wages and high predicted family income results in the lowest rate of second premarital childbearing. Again, the simulations show that the effects are not very large. Comparing row 13 with row 3 shows that a 60% increase in predicted family income yields a reduction of 4.5 percentage points, whereas an equivalent increase in family income produces a reduction of 5.5 percentage points (row 13 vs. row 23). The weak effect is due partly to fact that both family income and wages have a delaying effect on the initiation of the family-formation process. High levels of these variables delay both entry into marriage and first premarital childbearing and, therefore, will reduce the number of simulated second births both outside and within marriage.

Column 5 in Table 5 reveals the effect of different welfare levels. As expected, higher welfare levels generally produce a higher rate of second premarital childbearing, where the combination of low predicted wages and high AFDC levels produce the highest rates. However, the effects are quite modest: a 60% reduction in AFDC levels produces a decrease in second premarital births by around 5 percentage points.

Columns 6 and 7 in Tables 4 and 5 show the simulated mean time spent as an unwed mother for white and African American women, respectively. This statistic incorporates the effects of both the entry rate and the exit rate. First, the time spent as an unwed mother depends directly on how the economic variables affect the exit rate. Second, the economic variables will affect the entry rate and, therefore, will influence the number of women experiencing a premarital birth. But changes in the entry rate will also affect the timing of the first birth and, therefore, the covariate measuring duration until first childbearing. Not surprising, then, columns 6 and 7 reveal highly nonlinear and complex patterns.

Regarding the effect of family income and wages first (column 6 in Table 4), the lowest level (2.73 years) is produced when both variables are given low values (row 1). This somewhat unexpected result is driven by the negative coefficient associated with the duration variable that is included as a covariate in the subsequent transitions. The result indicates that although young women with low earnings may be more likely to experience premarital childbearing (compared with women with high incomes), they do not necessarily remain single mothers longer. Other combinations can also reduce the time spent as a single mother. For white women, for instance, low family income and high predicted wages (row 5) produce an average time spent as single mother of 2.77 years. Furthermore, a modest increase in predicted family income and a modest reduction in predicted wages (row 17) gives a mean time spent as an unmarried mother that is close to that when both income variables are set at very low levels (row 1). As shown in column 7, African American, on average, women spend more time as unwed mothers. It is interesting that African American women do not always respond to changes in the economic variables in the same way as white women. For white women, I tend to find that very high levels of wages reduces the time spent as an unwed mother, whereas for African American women, I find the opposite.

The last two columns in Table 5 show the mean time spent as an unmarried mother as a function of AFDC levels and wages. Again, the impact is highly nonlinear, and several combinations may produce similar outcomes. For low levels of AFDC, the mean time spent as a single mother is at its lowest, and there is not much impact of the wage rate (apart from when wages are reduced by 60%). In general, white women tend to remain single mothers longer as the AFDC levels are increased, although the impact is certainly not large. This impact of AFDC is more difficult to detect among African American women. In fact, they seem to be more or less neutral in terms of the AFDC levels. Overall the simulations indicate that different levels of welfare benefits have only very small impacts on the mean time spent as a single mother.

SUMMARY AND CONCLUDING REMARKS

The aim of this study has been to analyze how and to what extent economic variables affect nonmarital childbearing. Whereas the great majority of previous studies have limited their efforts to study the process of entering nonmarital motherhood, this study goes further in that it also considers the process of exiting this family status. Consequently, the study provides a more complete picture of how economic incentives interact with nonmarital fertility. The principal tool in this analysis is the estimation and simulation of a multiple-- destination, multiple-spell hazard regression model based on data from the NLSY.

In terms of entering unwed motherhood, most of my findings are in line with the existing literature. All three variables measuring young women's economic opportunities are significant in determining the initial family-formation transitions. Young women's earnings capacity is negatively associated with both first marriage and first premarital childbearing. These are offsetting effects, which implies that higher levels of predicted wages do not necessarily imply less out-of-wedlock childbearing. That predicted wages are negatively associated with marriage might seem inconsistent with previous empirical micro findings. This result, however, is likely to be driven by the fact that education is not included as an explicit covariate in the main regression analysis. Instead, education is included as a predictor for the individual-level wages. Thus, the negative impact of predicted wages is consistent with previous studies reporting that highly educated women tend to delay marriage.

In terms of family income, I found that women from wealthy families tend to delay the family-formation process in general, and to be less likely to experience out-of-wedlock childbearing. Finally I found that welfare benefits have a significant effect on experiencing premarital childbearing.

When a premarital birth takes place, the effect of economic resources changes. Welfare benefits, for instance, do not appear to be of any great importance in terms of marrying or having a second child outside marriage. The predicted wage level, on the other hand, is more important: women with high earnings are more likely to marry and are considerably less likely to have a second out-of-wedlock birth. The predicted family income, which has a strong negative effect both on first marriage and on premarital childbearing, has only a modest effect after a premarital birth has taken place.

The simulations provide a powerful tool in assessing the accumulating effects of the economic variables on young women's early family-formation behavior. For example, it demonstrates the offsetting effect of predicted wages in terms of entering first premarital childbearing and, therefore, the dominating effects of welfare benefits and family income. When a premarital birth takes place, the simulations demonstrate the shifting effects of the economic variables. The predicted wage level becomes important, whereas the effects of welfare and family income are neutralized. The simulations also show that the effects of the economic variables are often highly nonlinear and difficult to predict from the parameter estimates alone.

Perhaps the most important contribution of the simulations is that they provide information about the effectiveness of potential policy interventions. For instance, to what extent do changes in young women's perceived opportunity cost of premarital childbearing affect their behavior? Or equally important, what would be the effect of reducing welfare benefits by 30%, say, on a young woman's decision to remain unmarried? My results indicate that the overall effects from imposing different levels of the economic variables are not particularly large. The relatively weak effect of AFDC is consistent with many of earlier findings, including those of Moffitt (1992, 1994), but not in line with the strong effects reported by Rosenzweig (1999), as discussed earlier. That none of the three economic variables examined here has a large impact on the rate of premarital childbearing raises a general question regarding the extent to which financial incentives can explain a phenomenon such as nonmarital childbearing. The results presented here suggest that the effect of the economic variables is statistically significant both before and after premarital childbearing, but the impact tends to be modest. Thus, although financial incentives are certainly important, they are unlikely to provide a sufficient policy tool if the goal is to make sweeping changes in nonmarital childbearing.

[Footnote]
1. This result is based on the assumption that child rearing is undertaken by the parents. Ermisch (1989) showed that this simple theoretical prediction may be different when the household has the opportunity to purchase child care externally.

[Footnote]
2. This result also depends on an excess supply of women in the marriage market and poor quality of single men.
3. The extent to which economic theories are able to explain empirical patterns of marriage and premarital childbearing is not always clear. For instance, many studies have shown that there is a negative association between marriage and poor-quality marriage markets (e.g., Lichter et al. 1992; South 1996), but that this alone

[Footnote]
cannot explain the overall retreat from marriage. The effect of increasing female wages on marriage is also unclear (Qian and Preston 1993). Furthermore, the negative effect of generous welfare benefits has been rejected as an explanation for the overall decline in marriage rates because the retreat from marriage is a phenomenon not confined to those who receive welfare support. There is also an inconsistency in that increases in female headship over the last two decades have been followed by a decline in welfare benefits in real terms (Lichter, McLaughlin, and Ribar 1997; Moffitt, Ribar, and Wilhelm 1998).
4. The bulk of research into premarital childbearing comes from the sociological literature. Examples include Antel (1992), Cooksey (1990), and Wu and Martinson (1993), who investigated the importance of family background and intergenerational effects; Manning (1993), Manning and Landale (1996), and Manning and Smock (1995), who studied the interrelationship between cohabitation and premarital childbearing; Abrahamse, Morrison, and Waite (1988), who investigated the impact of stressful events

in early adulthood; Yamaguchi and Kandel (1987), who examined the relationship with respect to drug use and school dropout; and Hanson et al. (1987), who analyzed the role imperfect information among young adults plays on premarital childbearing.
5. 1 did not adopt the approach of Wolfe et al. (2001) in this paper. Here I consider multiple spells, each with different destination states, and the choice set is therefore larger and more complex than theirs. Computing the expected income streams for each trajectory is a nontrivial extension. The approach in this paper should be seen as an approximation to Wolfe et al.'s modeling strategy.

[Footnote]
6. In this framework, I ignored child mortality. Although the original sample contained few cases in which the child died, I excluded these cases from analysis. Thus, nobody in the sample I used made a transition from family status 4 to status 2 or from status 3 to status 1. Because marriages and fertility events were recorded by exact dates, these events will never occur at the same time; thus I excluded a transition from status 1 to status 4. Women giving birth to twins were excluded from the sample.

[Footnote]
7. The realization of the random variable V is represented by v.

[Footnote]
8. The original sample contained 6,283 women. The reduction in sample size was caused mainly by missing values in the covariates, as well as incomplete family histories. I reduced the number of missing values through data-cleaning procedures as suggested in Cole and Currie (1994).

[Footnote]
9. The CPS is the government monthly survey of about 60,000 households regarding employment and labor market participation. For each household, an adult person is selected to report the activities of all persons in the household. I use the May record of the NBER standardized extracts of 30,000 individuals from 1979 to 1992. The estimates of individual earnings and family income are available from the author on request.

[Footnote]
10. The AFQT is a weighted sum of four tests, which focus on reading and numeracy skills, of the 10-part Armed Services Vocational Aptitude Battery.

[Footnote]
11. Although a range of welfare schemes were available to the respondents during the period of observation, the most important cash benefit was given through AFDC. Other

welfare schemes, such as food stamps and Medicaid, followed more or less the same eligibility rules set for AFDC, but possessed considerably less crossstate variation.
12. 1 also estimated a range of simpler specifications, including models without unobserved heterogeneity, the use of actual family income instead of predicted family income, and models without time-varying variables. The parameters in Table 3 are expressed in terms of coefficients rather than relative risks.

[Footnote]
13. 1 reestimated the model using the sample of white and Hispanic women only to determine whether they respond differently than African American women. The sample size for the latter group was too small for a separate reestimation. The results indicate that white and Hispanic women are more sensitive to changes in the economic variables (the results are available from the author on request).

[Footnote]
14. Although the tables clearly show how the economic variables affect the statistic of interest, the remaining characteristics of the women are assumed fixed. Consider, for instance, a case in which predicted family income is increased by, say, 30%. The increase in predicted family income will reduce the number of women experiencing out-of-wedlock childbearing. But those women who now are no longer simulated as having an outof-wedlock birth because of the increase in predicted family income might change their behavior in other respects. For instance, they might spend more time in school, which will have an impact on the predicted wage rate and, in turn, will affect the family-formation transitions. This additional effect, here feeding through the predicted wages, will not be captured in the simulations.

[Reference]
REFERENCES

[Reference]
Aassve, A., S. Burgess, A. Chesher, and C. Propper. 2002. "Transitions From Home to Marriage Among Young Americans." Journal ofApplied Econometrics 17(1):1-23.
Abrahamse, A., P. Morrison, and L. Waite. 1988. "Beyond Stereotypes: Who Becomes a Single Mother?" RAND Report No. R-3489-HHS/NICHD.
An, C., R. Haveman, and B. Wolfe. 1993. "Teen Out-of-Wedlock Births and Welfare Receipt: The Role of Childhood Events and Economic Circumstances." The Review of Economics and Statistics LXXV: 195-207.

[Reference]
Antel, J.J. 1992. "The Intergenerational Transfers of Welfare Dependency: Some Statistical Evidence." The Review of Economics and Statistics 74:467-73.

Becker, G. 1965. "A Theory of Allocation of Time." Economic Journal 75:493-517.
. 1991. A Treatise on the Family. Enlarged edition. Cambridge: Harvard University Press.
Becker, G. and H.G. Lewis. 1973. "On the Interaction Between Quantity and Quality of Children." Journal of Political Economy 81:5143-62.

[Reference]

Brien, MJ. 1997. "Racial Differences in Marriage and the Role of Marriage Markets." Journal of Human Resources 32:741-78.
Brien, M., L. Lillard, and L. Waite. 1999. "Interrelated Family-Building Behaviors: Cohabitation, Marriage, and Non-marital Conception." Demography 36:535-51.
Bumpass, L. and H.H. Lu. 2001. "Trends in Cohabitation and Implications for Children's Family Contexts in the United States." Population Studies 54(l):29-41.
Cameron, S.V. and J.J. Heckman. 1999. "The Dynamics of Educational Attainment for Black, Hispanic, and White Males." National Bureau of Economic Research Working Paper No. W7249, Cambridge, MA.

[Reference]

Child Trends. 2002. "Contrary to Popular View, Birth Rates Increased Among Unmarried Women in Their Twenties." Available on-line:
http://www.childtrends.org/TBRate2002.asp (retrieved June 30, 2002).
Cole, N. and J. Currie. 1994. "Reported Income in the NLSY: Consistency Checks and Methods of Cleaning the Data." National Bureau of Economic Research Technical Working Paper, Cambridge, MA.
Cooksey, E. 1990. "Factors in the Resolution of Adolescent Premarital Pregnancies." Demography 27:207-18.

[Reference]

Duncan, G.J. and S.D. Hoffman. 1990. "Welfare Benefits, Economic Opportunities and the Incidence of Out-of-Wedlock Births Among Black Teenage Girls." Demography 27:519-57.
Ermisch, J. 1989. "Purchased Child Care, Optimal Family Size and Mother's Employment: Theory and Econometric Analysis." Journal of Population Economics 2:79-102.
Goldscheider, F. and C. Goldscheider. 1999. "The Changing Transition to Adulthood: Leaving and Returning Home." Thousand Oaks, CA: Sage Publications.
Hanson, S.L., D.E. Myers, and A.L. Ginsburg. 1987. "The Role of Responsibility and Knowledge in Reducing Teenage Out-of-Wedlock Childbearing." Journal of Marriage and the Family 49:241-56.

[Reference]

Haveman, R. and B. Wolfe. 1994. Succeeding Generations: On the Effects of Investments in Children. New York: Russell Sage Foundation.

Heckman, J.J. and B. Singer. 1984. "A Method for Minimising the Impact of Distributional Assumptions in Econometric Models for Duration Data." Econometrica 52:271-90.
Hoffman, S. and E. Foster. 2000. "AFDC Benefits and Nonmarital Births to Young Women." Journal of Human Resources 35:376-91.
Korenman, S., J.E. Miller, and J.E. Sjaastad. 1995. "Long-Term Poverty and Child Developments in the United States: Results From the NLSY." Children and Youth Services Review 17:127-55. Lancaster, T. 1990. The Econometric Analysis of Transition Data. Cambridge, UK: Cambridge University Press.

[Reference]
Lichter, D.T., D.K. McLaughlin, G. Kephart, and D.J. Landry. 1992. "Race and the Retreat From Marriage: A Shortage of Marriageable Men?" American Sociological Review 57:781-99
Lichter, D.T., D.K. McLaughlin, and D. Ribar. 1997. "Welfare and the Rise in Female-Headed Families." American Journal of Sociology 103:112-43.
Lundberg, S. and R. Plotnick. 1995. "Adolescent Premarital Childbearing: Do Economic Incentives Matter?" Journal of Labour Economics 13:177-200.
Manning, W.D. 1993. "Marriage and Cohabitation Following Premarital Conception." Journal of Marriage and the Family 55:839-50.

[Reference]
Manning, W.D. and N.S. Landale. 1996. "Racial and Ethnic Differences in the Role of Cohabitation in Premarital Childbearing." Journal of Marriage and the Family 58:63-77.
Manning, W.D. and P.J. Smock. 1995. "Why Marry? Race and the Transition to Marriage Among Cohabitors." Demography 32:509-20.
McLanahan, S. and G. Sandefur. 1995. Growing up With a Single Parent. Cambridge, MA: Harvard University Press.

[Reference]
Mincer, J. 1974. Schooling, Experience and Earnings. New York: Columbia University Press. Moffitt, R.A. 1992. "The Incentive Effects of the U.S. Welfare System: A Review." Journal of Economic Literature 30:1-61.
. 1994. "Welfare Effects on Female Headship With Area Effects." Journal of Human Resources 29:621-31.
Moffitt, R. 2000. "Welfare Benefits and Female Headship in U.S. Time Series." American Economic Reviews 90:373-77.

[Reference]
Moffitt, R., D. Ribar, and M. Wilhelm. 1998. "The Decline of Welfare Benefits in the U.S.: The Role of Wage Inequality." Journal of Public Economics 68:421-52
Qian, Z. and S. Preston. 1993. "Changes in American Marriage, 1972-1987." American

Sociological Review 58:482-95.

[Reference]
Raley, R.K. 2001. "Increasing Fertility in Cohabiting Unions: Evidence for the Second Demographic Transition in the United States." Demography 38:59-66.
Rendall, M.S. 1999. "Entry or Exit? A Transition-Probability Approach to Explaining the High Prevalence of Single-Motherhood Among Black Women." Demography 36:369-76
Roempke Graefe, D. and D.T. Lichter. 1999. "Life Course Transitions of American Children: Parental Cohabitation, Marriage, and Single Motherhood." Demography 36:205-17.

[Reference]
Rosenzweig, M. 1999. "Welfare, Marital Prospects, and Nonmarital Childbearing." Journal of Political Economy 107:53-32.
Rosenzweig, M.R. and KI. Wolpin. 1993. "Parental and Public Transfers to Young Women and Their Children." American Economic Review 84:1195-212.
Sander, W. 1992. "Unobserved Variables and Marital Status: The Schooling Connection." Journal ofPopulation Economics 5:217-28.

[Reference]
South, S.J. 1996. "Mate Availability and the Transition to Unwed Motherhood: A Paradox of Population Structure." Journal of Marriage and the Family 58:265-79.
Upchurch, D.M., L. Lillard, and C.W.A. Panis. 2002. "Nonmarital Chilbearing: Influences of Education, Marriage, and Fertility." Demography 39:311-30.
van den Berg, G. 2000. "Duration Models: Specification, Identification, and Multiple Durations." Handbook of Econometrics, Vol. V, edited by JJ. Heckman and E. Learner. Amsterdam: Elsevier Sci.

[Reference]
Willis, R.J. 1999. "A Theory of Out-of-Wedlock Childbearing." Journal of Political Economy 107:533-64.
Wolfe, B., K. Wilson, and R. Haveman. 2001. "The Role of Economic Incentives in Teenage Nonmarital Childbearing Choices." Journal of Public Economics 81:473-511.
Wu, L.L. and B.C. Martinson. 1993. "Family Structure and the Risk of Premarital Birth." American Sociological Review 58:210-32.

[Reference]
Wu, L.L. and B. Wolfe. 2002. Out of Wedlock: Causes and Consequences of Nonmarital Fertility. New York: Russell Sage Foundation.
Yamaguchi, K. and D. Kandel. 1987. "Drug Use and Other Determinants of Premarital Pregnancy and Its Outcome: A Dynamic Analysis of Competing Life Events." Journal of

Marriage and the Family 49:257-70.
Zimmerman, D.J. and P.B. Levine. 1999. "An Empirical Analysis of the Welfare Magnet Debate Using the NLSY." Journal of Population Economics 12:391-409.