CHILD CARE COSTS AS A BARRIER TO EMPLOYMENT FOR SINGLE AND MARRIED MOTHERS

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Abstract—Because women typically serve as primary care providers for their children, female labor force participation behavior is likely to be affected significantly by the costs associated with replacing maternal care with nonmaternal care. While some evidence of this phenomenon exists in the economics literature, discrepancies across studies make it difficult to provide conclusive evidence of the employment effects of these child care costs. This paper uses an improved SIPP survey design to present new evidence regarding the degree to which child care prices impede mothers' employment behavior, with additional evidence of the difference in these elasticities across marital status, empirical technique, and equation specification. This permits linking this paper to the existing evidence, drawing the conclusion that child care prices impede mothers' employment behavior significantly, with single mothers exhibiting less responsiveness in their labor force participation behavior to child care price changes than married mothers. Generally, these results support the basic finding of Ribar (1992), reject the smaller price of care elasticities found by Averett et al. (1997), Blau and Robins (1988), Connelly (1992), and Tolin (1992), but replicate the lower elasticities found in these papers by changing equation specifications. Also, significant sensitivity in the price elasticity is revealed, particularly with respect to changes in equation specification.

I. Introduction

APPROXIMATELY 20% of all American households are headed by women, of which 47% have income below the poverty line, and 25% live between the poverty line and two times the poverty line (Foley (1992)). An encouraging note, however, is that while fewer than one-half of single mothers were employed full time in 1991, 82% of female-headed households in which the mother worked full time did not live in poverty. Therefore a policy with the goal of strengthening the labor force attachment of female heads would probably also substantially raise the living standards of these households. Efforts to reduce the welfare dependency of single mothers via increased work effort are at the forefront of the current U.S. policy agenda. In addition labor force participation rates for married women are quite high from an historical standpoint, so the affordability of child care to two-parent families is also a concern.

Particularly for mothers, evidence exists to suggest that insufficient child care options can be a strong barrier to labor force participation, including the report to Congress by the U.S. General Accounting Office (1992), Cattan (1991), Mason and Kuhlthau (1992), O'Connell and Bloom (1987), Brayfield (1992), and Presser and Baldwin (1980).[1] Also, Robins (1988) found that child care costs can be a prohibitive employment barrier for public-housing residents, and Brayfield (1992) finds evidence supporting this conclusion for all mothers.

While the notion that child care cost and availability problems may restrict employment behavior is an empirical reality to some, the question is still being debated by researchers and policy makers. According to Robins (1991), ". . .child care subsidies are expected to increase the employment of welfare recipients and increase the quality of child care being purchased. Although these effects appear reasonable, very little empirical evidence exists confirming their validity. It is therefore of great interest to provide credible estimates of whether such effects are likely to occur."[2] In addition a vocal group exists within the political policy debate that continues to claim that these so-called barriers are not significant factors in the employment (and thus, welfare) participation choice. For example, Mead (1992) discusses this issue in his chapter "Barriers to Employment." He claims that the culture of poverty and personal choices are the primary factors encouraging welfare dependency, and child care problems are not significant.

In the existing literature, estimated child care price elasticities of employment for married women range from a high of -0.74 (Ribar 1992) to a low of -0.2 (Connelly 1992), with estimates from Blau and Robins (1988), Averett et al. (1997), Tolin (1992), and Powell (1997) falling in the middle of that range. There is very little evidence of the employment responsiveness to child care prices for single mothers, and both Michalopoulos et al. (1992) and Connelly (1990) find that this elasticity is essentially zero. Kimmel (1995) focuses on a subsample of low-income single mothers, and finds an elasticity equal to -0.35. The only two papers in the literature (Connelly (1992) and Ribar (1992)) that produce a direct estimate of the elasticity of employment with respect to changes in the price of care for married mothers (as is done in this paper) yield the two outlier observations.

This paper presents new evidence regarding the effects of child care prices on the employment behavior of both married and single mothers, and uses labor force participation equation derivatives to simulate the employment effects of revisions to demand-side child care subsidization policies. It links the existing literature by showing that relying on different formulas to construct the price of care, altering equation or econometric specification, or utilizing a revamped survey questionnaire may help explain differences in the price elasticity estimates. The attempt to reconcile these results with specific elasticity estimates in the literature is limited to the findings of Ribar and Connelly because

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[1] Child care research focuses only on mothers because they are the primary care providers in most families. For a discussion of men's participation in child care, see Maume and Mullen (1993).

[2] Also, see Garfinkel et al. (1990).

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theirs is the only general theoretical model sufficiently similar to make feasible such a direct comparison.

II. Description of the Underlying Behavioral Model

The behavioral model underlying the empirical work in this paper follows the work of Connelly (1992) and Ribar (1992), and a brief verbal description follows. Mothers are assumed to maximize utility, where utility is expressed as a function of leisure time, market goods, and child care quality. The constraints in this maximization problem include constraints on the mother's and children's time, a money budget constraint, and a production function for child care services.[3]

The maximization of this utility function subject to the constraints yields the primary estimating equation, representing the demand for leisure,[4]

$$LFP = \text{fn}(W, PCC, \text{other factors}).$$

Because employment behavior (not the continuous labor supply decision) is the focus of this paper, the above equation is shown with the dichotomous labor force participation (LFP) dependent variable, which is estimated via a probit function. The hourly wage W and the hourly price of care Pcc are entered in the LFP probit as two distinct terms because the total number of hours worked per week is not constrained to be equal to the number of paid child care hours.[5] Because W and Pcc are really average measures in these data, one might expect the two elasticities to be quite different.

The key parameters of interest in the above LFP equation are the wage and price of care coefficients. Two resulting elasticities are then be calculated: the child care price–employment elasticity and the wage–employment elasticity. Calculation of these elasticities drives the discussion of the policy effectiveness of subsidizing child care costs. In addition using the equations' predicted parameter values, simulations for the predicted probability of LFP using different levels of child care price subsidies are calculated.

[3] A family labor supply model (see, for example, Blau and Robins (1988)) would include the leisure time of other adults in the household as arguments in the family utility function. I treat other adult household members' leisure time as exogenous, and leave the examination of the potential endogeneity of household composition to later research. The two time constraints for mother and child reflect the necessity of allocating all 24 hours in a day. Including these two key constraints, and working through the maximization problem, yields a price of care measure that reflects the same margin as the wage, that is, hours of work. This follows Connelly (1992). Also, the nonlinearities in the budget constraint resulting from the link between the employment choice and the means-tested nature of AFDC eligibility for single mothers is not addressed in this paper.

[4] Equations for the demand for paid and unpaid child care services can also be derived from this general utility-maximization framework. A more complete model would entail simultaneous estimation of the work and child care choices, but the focus in this paper is employment behavior.

[5] For an example of the single regressor (hourly wage minus hourly price of care), see Averett et al. (1997). However, this application may be misleading because the wage is expressed in hours of work while the price of care is expressed in hours of child care.

III. Description of the Data

The primary data used in this paper are drawn from the sixth interview of the 1987 panel of the Survey of Income and Program Participation (SIPP). The SIPP is a nationally representative sample that is comprised of a series of panel surveys first begun in 1983 with the so-called 1984 SIPP panel. The interview month for the sixth interview of the 1987 SIPP panel varies across individuals, but the relevant time range is from July to December 1988.

Each SIPP interview questionnaire contains a set of special questions, referred to as topical modules, which are asked at a single interview. Interview 6 of the 1987 panel marked the first implementation of a substantially revamped child care questionnaire. In previous child care modules, child care expenditures were measured only in aggregate, so that in families with more than one child in care (or one child in more than one type of care) it is impossible to tie the aggregate expenditure to specific child care arrangements.[6]

The revised child care questionnaire eliminates this need for approximation by soliciting child care expenditure information separately for each child for up to two modes of care. Therefore the researcher knows the dollar amount paid for child care for as many as two different child care providers for up to three children. More importantly, however, the data resulting from the revised survey instrument are considered more reliable because the revised questionnaire contains more detailed, probing questions regarding hours and cost of care (see U.S. Department of Commerce (1992)).

Additional data not available in the SIPP are incorporated to provide information at the state level regarding child care regulation.[7] These variables describe the maximum allowed child-to-staff ratios in child care centers and the required first-aid training of care providers. They are included in the price of care equation as measures of child care quality because they describe the degree of child supervision and the quality of providers. Also, the state unemployment rate is included in the wage instrumenting equation to control labor demand conditions, and the state's average child care worker wage is included in the price of care instrumenting equation to control wage costs in the production of child care services. In 1990 an average of 62% of the total costs of child care production was devoted to personnel expenses (see Willer et al. (1991)). Finally, the state's average Medicaid expenditure per recipient and the Aid to Families

[6] The possible responses to this question include different types of providers, but do not indicate if any payment was rendered. Specifically, in the old surveys, the individual is asked to report a single dollar value for total child care expenditures for all children. Then the parent is asked the hours of care for the primary mode of care for each of up to three children. As a result of this question pattern, it is not possible to know which of the different types (and hours) of child care are paid versus unpaid child care. See appendix A for further details.

[7] Many thanks to Gwen Morgan of Work/Family Directions, Inc., for providing these data and continued consultations. For an in-depth discussion of child care quality issues, see Blau (1991), Hofferth and Wissoker (1992), or Waite et al. (1991). Also, all additional variables that are dollar values are for 1988, the same time period as for the SIPP data.

TABLE 1.—VARIABLE DEFINITIONS

Child care information	
*PRCARE*1	Price of child care per hour worked
*PRCARE*2	Price of child care per hour of paid care per child in paid care
PREDPRCR	Predicted price of child care (using *PRCARE*1 unless stated otherwise)
*MAX*3*YEAR*	State limits maximum child-to-staff ratio for three-year olds in center care to 10:1
FADTRAIN	State requires first-aid training of center-based child care providers
YESPAY	1 if paid for child care
TPAYMNTH	Monthly total paid for child care
Labor force information	
LFP	1 if mother worked for pay in month preceding the interview
PREDWAGE	Predicted hourly market wage
Demographic information	
YRSEDUC	Number of completed years of education
NONLABY	Monthly nonlabor income = family income − own earned income − own AFDC income
YESAFDC	1 if mother receives AFDC support
OTHADULT	# of adults other than mother in household
MARRY	1 if married with spouse present; 0 otherwise
NUMKIDS	Number of mother's own children present in family
*KID*0_2	1 if children aged 0–2 years are present in family
*KID*3_5	1 if children aged 3–5 years are present in family
*KID*6_12	1 if children aged 6–12 years are present in family
*KID*13_17	1 if children aged 13–17 years are present in family
METRO	1 if mother lives in a metropolitan area
SOUTH	1 if mother lives in the South
AGE	Age of mother, years
*AGE*2	Mother's age squared
NONWHITE	1 if mother is not white
UNHEALTHY	1 if mother is unhealthy
SICKKIDS	1 if any of the mother's children are unhealthy
*LAMBDA*1,2	Bivariate probit selection correction terms
MILLS	Univariate probit selection correction term
State information	
ADCGRANT	State's average AFDC grant for family of 3
MEDSTATE	State's Medicaid expenditure per recipient
UNEMPL	State's unemployment rate
AVGWAGE	State's average wage for child care providers

with Dependent Children (AFDC) grant guarantee for families of three are included in the LFP equation to explain the impact of states' welfare generosity on mothers' (particularly single mothers') willingness to participate in market work.

Because this paper focuses on the employment behavior of mothers, the estimating samples include females, ages 18 through 55, who are mothers or guardians of children under the age of 13.[8] The data are stratified by marital status into two estimating samples, with 2350 married mothers and 697 single mothers. Approximately 58% of both samples participate in the labor force, and 617 married women and 172 single mothers report paying for care. The definitions of the variables used in the empirical analyses are found in table 1 and the mean values of the variables are given in table 2. Note that married women are more educated on average than the single women, and working women who use paid care are more educated than those who do not pay for care. In addition, the percentage of single mothers receiving AFDC support is high (29%), with a significant fraction of the working single mothers who pay for care (7%) also receiving AFDC support. While the married mothers who pay for care have on average higher earnings and higher wages, the single mothers work more hours per week.

For working mothers paying for care, married mothers pay more per month for care than single mothers ($236 versus $201), but the two groups spend nearly identical fractions of their monthly earnings on child care, at just under 16%. However, when total family income is considered, single mothers pay nearly twice the percentage of their

[8] Children ages 13 or older require very little supervision, and these teenagers are frequently child care providers themselves. Note that this is the same children's age cutoff used in the National Child Care Survey.

TABLE 2.—KEY VARIABLE MEANS

	Married	Single	Married and Pay for Care	Single and Pay for Care
Demographic information				
Number of observations	2350	697	617	172
YRSEDUC	13.02	11.92	13.79	12.57
	(2.46)	(2.41)	(2.39)	(2.26)
NONLABY	2641.58	708.20	2418.75	690.03
	(2213)	(1237)	(1543)	(1244)
YESAFDC	0.011	0.29	0	0.07
	(0.10)	(0.45)	(0)	(0.26)
OTHADULT	1.34	0.97	1.11	0.76
	(0.76)	(1.15)	(0.41)	(1.20)
MARRY	1.00	—	1.00	—
	(0)	—	(0)	—
NUMKIDS	2.03	1.81	1.82	1.61
	(0.95)	(0.99)	(0.84)	(0.87)
METRO	0.70	0.75	0.71	0.78
	(0.46)	(0.44)	(0.46)	(0.42)
SOUTH	0.32	0.33	0.34	0.31
	(0.47)	(0.47)	(0.47)	(0.46)
AGE	33.51	31.69	31.91	30.09
	(6.52)	(7.72)	(5.44)	(6.23)
NONWHITE	0.10	0.33	0.10	0.23
	(0.31)	(0.47)	(0.30)	(0.42)
LFP	0.59	0.58	1.00	1.00
	(0.49)	(0.49)	(0)	(0)
*KID*0_2	0.29	0.23	0.36	0.30
	(0.45)	(0.42)	(0.48)	(0.46)
*KID*3_5	0.41	0.34	0.57	0.44
	(0.49)	(0.48)	(0.50)	(0.50)
*KID*6_12	0.67	0.66	0.49	0.54
	(0.47)	(0.47)	(0.50)	(0.50)
*KID*13_17	0.25	0.20	0.10	0.09
	(0.43)	(0.40)	(0.30)	(0.28)
UNHEALTHY	0.06	0.12	0.04	0.03
	(0.23)	(0.32)	(0.19)	(0.17)
SICKKIDS	0.03	0.03	0.04	0.01
	(0.18)	(0.18)	(0.18)	(0.11)
MEDSTATE	1959.97	1973.34	1990.32	2006.14
	(681)	(709)	(660)	(698)
Labor force information				
Number of observations	1396	402	617	172
EARNINGS (monthly)	1207.72	1264.40	1478.55	1325.83
	(943.10)	(960.58)	(1001)	(880.24)
WAGE	8.57	7.90	9.71	8.14
	(5.68)	(4.76)	(5.72)	(4.29)
HOURS (weekly hours worked)	33.61	37.20	36.28	38.25
	(11.85)	(10.12)	(10.47)	(8.97)
Child care information				
YESPAY (0–1)	0.26	0.25	1.00	1.00
	(0.44)	(0.43)	(0)	(0)
TPAYMNTH	62.21	49.64	235.85	201.15
	(132.09)	(106.02)	(158.95)	(122.87)
*MAX*3*YEAR*	0.31	0.34	0.31	0.31
	(0.46)	(0.47)	(0.46)	(0.46)
FADTRAIN	0.42	0.40	0.44	0.45
	(0.49)	(0.49)	(0.50)	(0.50)
*PRCARE*1	0.45	0.33	1.70	1.34
	(1.09)	(0.78)	(1.53)	(1.05)
*PRCARE*2	0.63	0.59	2.40	2.38
	(1.65)	(1.61)	(2.47)	(2.52)

Note: Standard deviations are in parentheses.

income in child care than do married mothers. Finally, the average hourly amount paid in child care in terms of the mother's work hours (*PRCARE*1) is consistent with the figures presented in ''Who's Minding the Kids?'' (U.S. Department of Commerce (1992)). Working married mothers pay $1.70 per hour worked, whereas single mothers pay $1.34 per hour worked. While single mothers tend to have younger children (needing care that is typically more costly than care for older children), they are more likely to rely on relative care, a less expensive source of care than formal market care.

The primary measure of the hourly price of child care utilized in this paper is *PRCARE*1. This variable is constructed by dividing the total amount paid for child care that month for up to three children by the total hours worked that month.[9] This measure is hourly in the same sense that monthly income divided by hours worked per month is an hourly wage, and is the same formulation utilized by Connelly (1992), except that she uses the less detailed 1984 SIPP data. I prefer this definition of the price of care because the wage and price of care are measured on the same margins (hours of work), consistent with the fact that both are used to explain the discrete employment outcome. An alternative to this measure for the price of care (relying on the definition used by Ribar (1992)) will be tested in a sensitivity analysis later in the paper.

The wage measure used in the empirical analyses is an average hourly measure constructed by dividing monthly earnings by the product of hours worked per week and weeks worked per month.[10] This wage measure is actually a net wage, approximated by extrapolating an hourly tax burden by assuming the mother works full time, year-round. This use of the full-time, year-round normalization is intended to reduce the severity of the endogeneity of the actual tax burden.

IV. Estimation Summary

The primary estimating equation is a structural LFP probit equation, which includes as regressors predicted values for the price of child care and the wage (*PREDPRCR* and *PREDWAGE*). The wage and child care price are not observed for all mothers and must be constructed using instrumenting equations. The wage is observed for working mothers only. Therefore the wage equation regression is estimated for this selected sample using the appropriate correction for sample selection (see Heckman (1979)). The results of this wage regression are used to construct a predicted wage (*PREDWAGE*) for each mother.

The child care price is constructed from reported child care expenditures and is observed only for working mothers who report paying for child care. The appropriate selection correction for the child care price equation is complicated because the selection is a result of two discrete decisions: the decision to participate in the labor market and the decision regarding the use of paid care. The selection correction technique used produces two terms akin to Heckman's (1979) single-termed inverse Mills ratio, referred to as *LAMBDA*1 and *LAMBDA*2. Derivation of this selection correction can be found in Maddala (1983, p. 282), with related identification concerns presented in Tunali (1986). Applications of the procedure in the child care literature can be found in Michalopoulos et al. (1992), Connelly (1992), and Ribar (1995). The child care price equation is estimated with *LAMBDA*1 and *LAMBDA*2 included as regressors, and the results are used to construct a predicted price of care (*PREDPRCR*) for each mother.[11] The sensitivity analyses include the alternative of estimating the price of care equation with a single sample selection correction term, as is used by Ribar (1992).

The technique of predicting the price of child care out of sample is not without its critics. Hotz and Kilburn (1991) exploit the availability of child care data for nonworking mothers to test the validity of using data on workers only to explain the demand for child care for nonworking mothers. Their research shows that care must be taken when attempting to predict the hourly price of care for nonworking mothers. However, it is possible that these nonworking mothers utilize a type of child care that they themselves would not utilize were they to work.[12] In addition, because the focus of this paper is employment behavior, it is reasonable to use child care data obtained from working mothers to estimate the child care price structure available to working mothers. Finally, child care data for nonworking mothers are not available in the SIPP data. For all of these reasons, I rely on the standard approach.

V. Results

Results from the preliminary regressions estimated to construct *PREDWAGE* and *PREDPRCR* are found in appendix B, tables B.1 through B.3. While space limitations preclude providing a detailed discussion of these results in text, the results for each of these equations are consistent with those usually described in the relevant literature.

[9] The price of care used in the empirical analyses is net of the child care tax credit. An hourly credit (per hour of care) was approximated by calculating the subsidy that would apply were the mother to work full time year-round, and is based on the assumption that the tax credit is received by all who are eligible. Note that the current tax credit is not refundable. Any calculated subsidy in excess of the individual's tax liability is ignored. See Averett et al. (1997) for a sophisticated treatment of the child care tax credit. I use three as the upper limit for the number of children because in this wave of the SIPP, this is the maximum number of children for whom the child care information was collected separately. Note that only 1.5% of working single mothers and 2.4% of working married mothers have more than three children under 13 years old, with only 0.5% and 0.4%, respectively, of these mothers paying for more than three children in care.

[10] Note that wages are constructed in this way for each individual in the labor force, even for those workers reporting hourly wages. This avoids the potential pitfalls from mixing two different wage measures, which are likely to differ in the extent to which they capture the true marginal wage.

[11] The sample selection correction terms are not included in the calculation of *PREDWAGE* or *PREDPRCR*.

[12] See Ribar (1995) for an examination of the linkage between the price paid for child care services and full-time versus part-time utilization of this paid child care.

TABLE 3.—STRUCTURAL PROBIT COEFFICIENTS

	Married Mothers	Single Mothers
PREDPRCR	−0.691[a]	−0.168
	(−3.14)	(−0.49)
	[−0.923]	[−0.219]
PREDWAGE	4.998[a]	7.828[c]
	(5.47)	(1.73)
	[3.249]	[5.278]
NONLABY	2E-5	2E-5
	(0.72)	(0.27)
*KID*0_2	−0.033	−0.450[c]
	(−0.21)	(−1.92)
*KID*3_5	0.175	−0.176
	(1.29)	(−1.20)
AGE	−0.397[a]	−0.469
	(−3.94)	(−1.31)
*AGE*2	0.005[a]	0.006
	(3.75)	(1.30)
YRSEDUC	−0.317[a]	−0.374
	(−4.10)	(−1.29)
NONWHITE	−0.060	0.487
	(−0.51)	(0.94)
SICKKIDS	−0.316[b]	−0.032
	(−2.07)	(−0.11)
UNHEALTHY	−0.383[a]	−0.932[a]
	(−3.23)	(−5.28)
METRO	−0.796[a]	−0.481
	(−3.93)	(−1.58)
SOUTH	0.092	0.275
	(0.91)	(0.55)
ADCGRANT	−5E-5	−0.002[a]
	(−0.17)	(−2.88)
MEDSTATE	−2E-6	2E-8
	(−0.05)	(−0.02)
*KIDS*13_17	−0.025	0.412[b]
	(−0.22)	(2.19)
NUMKIDS	0.255[a]	−0.118
	(3.38)	(−1.16)
OTHADULT	0.074	−0.007
	(1.62)	(0.11)
INTERCEPT	5.514[a]	1.387
	(3.45)	(0.59)
LOG-LIKELIHOOD	−1458.78	−386.30

Notes: *t*-statistics are in parentheses; derivatives are in brackets.
[a] Significant at the 1% level.
[b] Significant at the 5% level.
[c] Significant at the 10% level.

Estimated coefficients for the primary LFP probit equations are given in table 3. (Extensive sensitivity analyses using a different econometric methodology and definition for the price of care are discussed later in this section.) The regressors in this equation include the predicted hourly wage and the predicted hourly price of child care,[13] along with nonlabor income, three dummy variables for the presence of children ages 0 to 2, 3 to 5, then 13 to 17, total number of children, a dummy variable for the presence of other adults in the family, age, age squared, years of education, a nonwhite dummy variable, a dummy variable for the presence of a sick child in the family, a maternal health status dummy, dummy variables for living in a metropolitan area or the South, plus two measures of the state's welfare generosity. There are several noticeable differences for the nonprice regressors across marital status in these regression results, but because these results are not relevant for the primary purpose of the paper, they are not discussed in text. In both married and single samples, increases in the price of care (statistically significantly) reduce the probability of LFP, whereas increases in the potential market wage increase the LFP probability. These basic results are consistent with a priori expectations. Mothers will be less likely to seek market work if the costs of taking a job are higher, and they will be more likely to seek work, the greater the difference between the market wage and the opportunity cost of their time.

By calculating participation elasticities, the magnitudes of the impact of changes in these two key variables can be compared across samples. Price and wage elasticities also appear in table 3. The price elasticity is calculated by first multiplying the probit coefficient by the probit's density function evaluated at sample means to yield the derivative, and then multiplying by (mean price)/(mean LFP). According to Connelly (1991), "the larger the quality component of child care, the less negative we expect the effect of child care prices on mother's labor market decisions to be." Available evidence suggests that married families' child care expenditures are more responsive to quality factors than are care expenditures in families with single mothers. This suggests that the child care price elasticity for single mothers should be greater than that of married mothers—a conclusion strongly contradicted by the results in table 3. The child care price elasticity for employment for single mothers is −0.22, whereas the corresponding price elasticity for married mothers is −0.92. Using a *t*-test, the corresponding coefficients for these two estimates are statistically significantly different from each other.[14]

Just as the child care price elasticities differ across marital status, there is also a significant difference between the wage elasticities across marital status. However, both elasticities are quite large, resulting from the inclusion of age squared in this LFP probit.[15] This finding is not without precedent in the child care literature as well as in the labor supply literature in general. Connelly (1992) found a wage elasticity of 3.7 for married mothers. Averett et al. (1997) found an elasticity equal to 1.6, and Averett and Hotchkiss (1995) estimated this elasticity to be in the range of 1.9 to 2.5. This large and sensitive wage elasticity could result from the fact that while LFP tends to rise with age, for the most part, until at least age

[13] This predicted price of care is derived from *PRCARE*1 unless stated otherwise. Note that the inclusion of these two generated regressors causes heteroskedasticity, thus producing biased estimated standard errors. The correction for this econometric problem is seriously complicated by the fact that the true wage and price of care are not observed at all in many observations, so the results presented here do not correct for this source of bias.

[14] Use of this test requires the assumption that the square roots of the equation variances are equal. Also, note that probit coefficients are estimated by normalizing the equation variance to 1.

[15] Extensive sensitivity analyses reveal that age squared is the single regressor driving the high wage elasticities.

Table 4.—Child Care Price Subsidy Simulations for Single Mothers

Mean of actual *LFP*	0.58
Predicted *LFP* at full *PREDPRCR*	0.58
Predicted *LFP* at 50% *PREDPRCR*	0.63
Predicted *LFP* at free *PREDPRCR*	0.67

Table 5.—Comparison to Literature for Married Mothers

	Price Elasticity[a]
1. Connelly (1992)	−0.20
2. Replication of Connelly	−0.42
3. Ribar (1992)	−0.74
4. Replication of Ribar	−0.89

Note: [a] Each elasticity estimate is significant at the 1% level.

50, wages tend to turn down with age, at least once the mother reaches about age 40. A second explanation is that lifetime expected wages are a quadratic in age, so that when age squared is included, the expected wage is partialed out via age and age squared, so the coefficient on the predicted wage produces a more pure substitution effect, without any generally negative wealth effect component. Finally, the sensitivity of the wage elasticity to the inclusion of age squared in the LFP probit results in part from the difficulties associated with instrumenting the wage using age and age squared as proxies for work experience.

Employment Simulations: In order to provide evidence regarding the likely effects of child care policies that reduce the cost of child care, I calculate the mean predicted probabilities of LFP for single mothers using the actual (predicted) price of care, then simulate the participation probabilities for direct child care subsidies of 50% and 100%.[16] Single mothers are targeted here because they are less likely to benefit from existing tax credits, which comprise the bulk of federal and state spending on child care. In addition they have been the target group for the bulk of welfare and child care policy discussions and reforms for the last several years.

The subsidy simulation provides estimates of the degree of employment response that could be anticipated in the event of significant child care subsidies. The results of these simulations are given in table 4. For single mothers, the mean predicted probability of LFP using the actual price of care is 0.58; with half of this care cost subsidized, the mean predicted LFP probability rises to 0.63, and with free care the LFP probability rises to 0.67. While these simulations are implemented without regard to potential general equilibrium effects, they indicate that single mothers' LFP behavior can be expected to respond to subsidized child care, although the impact is not substantial.[17] Additional simulations were conducted to predict the impact on single mothers' LFP rates of altering the structure of the Federal Dependent Care Tax Credit. Two revisions to the credit were examined: first, making the credit refundable, and second, making it refundable and multiplying the maximum per-child credit by 1.5 and increasing the annual income eligibility from $30,000 to $40,000. Increasing the subsidization of child care in this way yielded no significant impact on single mothers' LFP rates, probably because these changes only negligibly alter the hourly child care subsidization rate. Garfinkel et al. (1990) show that more generous extensions to the tax credit have a modest effect on the employment and earnings of single mothers.

Comparison of Price Elasticity to Literature: The price elasticity for married mothers reported above is somewhat larger than that found by Ribar (1992), and considerably larger than Blau and Robins (1988), Connelly (1992), Tolin (1992), and Averett et al. (1997).[18] Ribar's price elasticity of −0.74 for married women is significantly larger than that found by the other researchers, prior to this paper. Ribar explains that his higher elasticities may be a result of the manner in which he defined the hourly price measure. In his research, price of care is defined as child care expenditures per hour of care utilized per child. Blau and Robins, as well as Connelly and the research presented in this paper, rely on the definition of expenditures per child per hour worked, a measure that may mix cost and utilization effects. However, this mix is appropriate given the significant economies of scale seen in child care price data. Also of interest is the concern expressed by Connelly (1992), that the disagreement across papers in the price elasticity for married mothers is one of the most important unanswered child care research questions.

Connelly and Ribar rely on a theoretical model that is fundamentally similar to that used in this paper, thereby permitting a more careful comparison to the results for married mothers shown in table 3. These two papers are the most important to replicate because their elasticity estimates represent the lower and upper bounds of the range seen in the literature. This direct comparison is presented in table 5. The table shows the elasticities reported by Connelly and Ribar, as well as their elasticities replicated using the 1987

[16] See Hayes et al. (1990) for a detailed discussion of the general equilibrium impact of different potential policy revisions.

[17] Berger and Black (1992) also find that subsidizing child care increases single mothers' probability of LFP, but their predicted response to this subsidization is relatively small. Their sample is drawn from individuals already committed to an experimental welfare-to-work program. Kimmel (1995) finds greater responsiveness to child care subsidies, but she focuses on a subsample of low-income single mothers. Finally, corresponding simulation results for married mothers are not presented in text or in the table because the simulations are not realistically relevant for them, but as expected, married mothers exhibit much stronger LFP responsiveness to the child care subsidies than do single mothers.

[18] Consistent with Ribar (1995), estimating the model for married mothers with preschool children yields a somewhat smaller price of care employment elasticity (−0.69), supporting the hypothesis that mothers of young children may be less willing to work, even at very low child care prices, due to the extremely valuable opportunity cost of their time and the unavailability of substitutes. This finding contradicts Maume (1991) and Averett et al. (1997), whose results support the counterhypothesis that the greatest users of paid child care are likely to be those most responsive to changes in the price of such care.

SIPP data.[19] To replicate Connelly's elasticity, the only specification change necessary is to exclude many of the regressors used here. Note that Connelly (1992) uses the same price of care measure, relies on a directly comparable specification of the structural probit, and utilizes the same econometric technique to correct the sample selection in the price of care equation. Connelly's elasticity estimate is -0.2 and the replication yields an elasticity equal to -0.42.[20] Comparing Connelly's elasticity to the replicated value, the null hypothesis that the two corresponding coefficients are equal cannot be rejected using a *t*-test. Note that the specification used in this paper is superior to that used by Connelly due to its stronger identification resulting from the additional, unique regressors in the price of care equation. Also, as noted earlier, the 1987 SIPP data may be more reliable than the 1984 data.

A comparison of this paper's results to Ribar (1992) is complicated due to two key differences in methodology and equation specification: (1) a single sample selection correction term in the price of care equation instead of the bivariate correction term, and (2) a different definition of the price of care (referred to here as *PRCARE*2). It also differs due to a slightly different specification of the final LFP probit, and a more limited list of regressors in the price of care equation. Ribar's univariate selection correction term included in his price of care equation is constructed from the estimation of a single probit equation for the discrete decision to pay for care, and includes all observations in the sample, including mothers out of the labor force (who are not asked the child care questions), in with the group not paying for care. The bivariate selection correction term is needed to produce a prediction of the price of care that, for nonworkers, reflects the price they would pay if they had been working. Ribar's selection correction technique is not the preferred approach because it produces a biased sample selection correction term due to the nonzero covariance between the errors in the LFP and pay for care equations (Greene (1993)). However, as the sensitivity analyses show, this choice of selection correction methodology proves to be unimportant in the results.

As mentioned earlier, Ribar's price measure is defined per hours of paid care, rather than hours of work, and so requires a precise designation of care hours in paid versus unpaid care. Because this designation is not as clear with the 1984 SIPP data as with the 1987 SIPP, Ribar had to implement an assignment procedure to sort total care hours into paid versus unpaid hours of care.[21] As a result, his price of care measure may be an understatement of the actual hourly price of care in some cases, and may produce an imprecise estimate of the price elasticity of employment.

Estimation using Ribar's model, equation specification, and price of care measure with the 1987 data transformed to mirror the 1984 SIPP produced a child care price elasticity equal to -0.89, similar to Ribar's estimate of -0.74, and nearly identical to the finding in this paper. (Results from this replication are given in appendix B, table B.4.) A *t*-test fails to reject the null hypothesis that the two corresponding coefficients are equal.

Although the two elasticity estimates are similar, the methodologies are quite different, so extensive sensitivity analyses were conducted to determine how each individual difference contributes to the overall gap between Ribar (1992) and this paper. Using this paper's method as the starting point, three alternative versions were estimated: (1) switching from the bivariate to the univariate sample selection correction, (2) switching from *PRCARE*1 to *PRCARE*2, and (3) switching to Ribar's equation specification. Results from each of these three permutations are given in appendix B, table B.4. Each of the three modifications affects the resulting price elasticity, but only by a small amount.

For the sake of consistency, each of these replications and sensitivity analyses was repeated for the single mother sample, and the complete results are given in table B.5. The single mother estimates are much more sensitive to specification and model changes. This may be due to the relative weakness of the wage and price instruments for single mothers (Bound et al. (1993)). There is very little evidence regarding the price of care elasticity for single mothers that can be compared with this paper. Using a more sophisticated econometric model, Connelly (1990) finds this elasticity to be essentially zero, a finding supported by this paper. Kimmel (1995) examines the employment responsiveness to child care prices for low-income single mothers, and finds an elasticity equal to -0.35. But this finding is not directly comparable to the research in this paper due to its focus on single mothers living in poverty.

Despite the differences in model, data, and equation specification, Ribar's (1992) elasticity is quite similar to the finding in this paper. And it is mainly the difference in equation specification that drives Connelly's (1992) smaller elasticity. In fact, much of the variation in child care price elasticity estimates across papers in the literature is likely due to equation specification. This suggests that researchers in this field must be very careful to explain their selection of variables to include in the various equations, and conduct sensitivity analyses to determine the importance of the specification chosen.

VI. Conclusions

The key finding in this paper is that child care prices significantly impede married mothers' labor force participation behavior. In addition child care elasticities are affected

[19] For the replications, these data are transformed to be consistent with the data resulting from the less-detailed 1984 SIPP survey instrument. See appendix A for details.

[20] The complete *LFP* probit equation results from the Connelly replication are given in the first column of table B.4 in appendix B.

[21] However, assignment was only necessary for families with more than one child or one child in multiple arrangements. Using the data from the new survey instrument to gauge the accuracy of Ribar's procedure reveals that his procedure would have resulted in mistaken assignment of care to paid care in 10% of cases. Note that the use of *PRCARE*1 with the 1984 SIPP does not require this data assignment procedure.

dramatically by the manner in which the price of care measure is constructed, and equation and econometric specification. Finally, this paper's results are reconciled with the existing evidence. Comparing the results here to results using the 1984 SIPP, there is insufficient evidence to conclude that the care elasticity has shifted substantially over time. Consolidating the existing evidence, the "true" child care price elasticity for married mothers is in the range of -0.4 to -0.9. Although this range is broader than a policy maker might prefer, it indicates a reasonable degree of agreement between researchers, and provides sufficient evidence to simulate likely effects of a range of potential policy revisions. The findings for single mothers are much less robust.

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APPENDIX A

SIPP Survey Questions

I. Relevant Questions from the Child Care Topical Module from the 1984 Panel

A. Questions asked for each of the three youngest children

1. During last month, what was your youngest child doing or how was the child usually cared for during most of the hours that you worked?

2. Where was this child usually cared for under this arrangement?
3. Was this child usually cared for this way during all of the hours that you worked? If not, about how many hours per week was this child usually cared for under this arrangement while you were at work?
4. What did this child do or how was this child cared for during most of the other hours that you worked?
5. Where was this child usually cared for under this other arrangement?

B. Questions that are not child-specific

1. Are any of the children cared for by a grandparent, other relative, nonrelative, day/group care center, or nursery or preschool? If YES:
2. Did you or your family usually pay cash for any of the child care that your children received?
3. In a typical week, how much did you or your family pay for child care (for all children receiving child care)?
4. Besides any cash payment, did you pay for any child care through a noncash arrangement such as providing room and board or exchanging child care services?
5. During last month, did you or your spouse lose any time from work because the person who usually took care of the child (children) was not available?

II. Relevant Questions from the Child Care Topical Module from the 1987 Panel

A. Questions asked for each of the three youngest children

1. During last month, what was your youngest child doing or how was the child usually cared for during most of the hours that you were working, looking for work, or in school?
2. Was this child usually cared for at his/her home, at someone else's home, or at some other place?
3. Was any money payment usually made for this arrangement?
4. Does your family pay for this child's child care separately, or does the payment for the care you just described also cover some other child?
5. In a typical week, how much did you or your family usually pay in this arrangement for this child?
6. About how many hours per week was this child usually cared for in this arrangement while you worked (were in school/ looking for a job) last month?
7. Was there any other arrangement usually used for this child in a typical week last month?
8. Was this child usually cared for at his/her home, at someone else's home, or at some other place?
9. Was any money payment usually made for this arrangement?
10. Do you or your family pay for this child's care separately, or does the payment for the care you just described also cover some other child?
11. In a typical week, how much did you or your family usually pay for this arrangement?
12. About how many hours per week was this child usually cared for in the arrangement while you worked (were in school/ looking for a job)?

B. Questions that are not child-specific

1. Considering all of your children under 15 in the household, even those not previously mentioned, how much did you or your family pay for child care for all of these children for all arrangements used, in a typical week? (Only asked if more than three children in paid care.)
2. During last month, did you or a spouse lose any time from work (school/job hunting) because the person who usually took care of the child(ren) was not available?
3. During the past four months, did you change any child care arrangements for any children under age 15?
4. For what reasons did this/these child care arrangements change?

III. Details Concerning Transformation of the 1987 Data to Mirror the 1984 Data

1. The initial step of the data transformation is to assign care arrangements to paid versus unpaid in families with more than one child in care or one child in multiple care arrangements.
2. In cases where primary care arrangement hours are not asked (when child in this arrangement for all of the mother's work hours), hours of care are set equal to work hours.
3. Because hours of care in secondary care arrangement are not asked in the 1984 panel, they are set equal to the mother's work hours minus the hours in the primary care arrangement. When this residual is negative or zero, secondary care hours are set equal to one-third of the mother's work hours.
4. In the 1984 panel, the amount paid for child care is obtained via a single question, and includes amount paid for families with more than three children in care. However, the hours reported are just for the three youngest children. To transform the 1987 data, the hours of care for the third youngest child are used to impute values for the older children.
5. To transform weekly information to monthly data, the variable indicating the precise number of weeks in the given month is replaced with 4.3.
6. Details concerning differences between the data in the 1984 and 1987 SIPP are available upon request from the author. Also available are additional details concerning the transformation undertaken to make the data in this paper mirror that of Connelly (1992) and Ribar (1992), and the number of cases in the 1987 panel requiring some data assignment for the transformation.

APPENDIX B

TABLE B.1.—LFP PROBIT COEFFICIENT AND WAGE COEFFICIENT ESTIMATES MARRIED AND SINGLE MOTHERS

	Married		Single	
Variables	*LFP* Probit	Wage Equation	*LFP* Probit	Wage Equation
YRSEDUC	0.0972[a]	0.0829[a]	0.1237[a]	0.0640[a]
	(7.59)	(12.14)	(5.03)	(5.67)
NONWHITE	0.0569	−0.0280	−0.3078[a]	−0.1076[a]
	(0.63)	(−0.60)	(−2.65)	(−2.34)
NONLABY	−0.9E-4[a]	—	0.6E-5	—
	(−9.0)		(0.11)	
AGE	0.1196[a]	0.1062[a]	0.1419[a]	0.0782[b]
	(3.36)	(5.11)	(2.63)	(2.26)
*AGE*2	−0.0019[a]	−0.0014[a]	−0.0018[b]	−0.0010[a]
	(−3.80)	(−4.61)	(−2.25)	(−2.91)
*KID*0_2	−0.4768[a]	—	−0.3713[a]	—
	(−6.81)		(2.50)	
*KID*3_5	−0.1955[a]	—	−0.1485	—
	(−3.26)		(−1.17)	
*KID*13_17	0.2364[a]	—	0.3723[b]	—
	(2.76)		(2.09)	
NUMKIDS	−0.1024[a]	−0.414[a]	−0.2373[a]	−0.0112
	(−2.85)	(−2.37)	(−3.26)	(−0.44)
OTHADULT	0.0299	—	−0.0111	—
	(0.75)		(−0.17)	
SICKKIDS	−0.3163[b]	—	−0.0037	—
	(−2.11)		(−0.01)	
UNHEALTHY	−0.3808[a]	—	−0.9378[a]	—
	(−3.17)		(−5.30)	
METRO	0.0176[a]	0.2098[a]	0.0148	−0.0605
	(16.7)	(6.75)	(−0.12)	(−1.39)
SOUTH	0.0404	0.0110	0.0218	−0.0485
	(0.43)	(0.35)	(0.12)	(−1.13)
UNEMPL	−0.1426[a]	−0.0235[a]	−0.0835[a]	−0.0095
	(−5.70)	(−2.48)	(−1.65)	(−0.74)
MAX3YEAR	0.0671	—	−0.1319	—
	(0.96)		(−0.98)	
FADTRAIN	−0.2270[a]	—	0.0061	—
	(−3.15)		(0.04)	
MEDSTATE	−0.3E-4	—	0.1E-4	—
	(−0.60)		(0.10)	
ADCGRANT	−0.0003	—	−0.0011	—
	(−1.0)		(−1.59)	
AVGWAGE	−0.8800[a]	—	−0.6491	—
	(−3.03)		(−1.07)	
MILLS	—	0.2427[a]	—	0.1192
		(3.15)		(1.17)
Intercept	0.3857	−1.4416	−1.0397	−0.4070
	(0.49)	(−3.86)	(−0.70)	(−0.84)
R^2/log-likelihood	−1456.20	0.1975	−385.02	0.2009

Notes: Estimated in two steps to construct predicted wage (*PREDWAGE*). *t* -statistics are in parentheses.
[a] Significant at the 1% level.
[b] Significant at the 5% level.
[c] Significant at the 10% level.

TABLE B.2.—BIVARIATE PROBIT COEFFICIENT ESTIMATES MARRIED AND SINGLE MOTHERS

	Married Mothers		Single Mothers	
Variables	*LFP*	*YESPAY*	*LFP*	*YESPAY*
YRSEDUC	0.0968[a]	0.0554	0.1236[a]	0.0266
	(7.50)	(0.84)	(5.42)	(0.25)
NONWHITE	0.0600	−0.0447	−0.3078[a]	−0.2838
	(0.69)	(−0.37)	(−2.53)	(−0.87)
NONLABY	−0.9E-4[a]	0.3E-4	0.6E-5	0.1E-4
	(−8.75)	(0.51)	(0.11)	(0.16)
AGE	0.1218[a]	0.1322	0.1420[a]	0.1299
	(3.37)	(1.25)	(2.60)	(0.72)
*AGE*2	−0.0019[a]	−0.0021	−0.0018[a]	−0.0082
	(−3.69)	(−1.28)	(−2.33)	(−0.86)
*KID*0_2	−0.4761[a]	0.9171[a]	−0.3714[a]	1.6891[a]
	(−6.69)	(7.29)	(−2.40)	(3.96)
*KID*3_5	−0.1975[a]	0.9772[a]	−0.1487	0.9402[a]
	(−3.08)	(8.64)	(−1.17)	(4.41)
*KID*13_17	0.2381[a]	−0.2796[b]	0.3730[b]	−0.5537
	(2.78)	(−1.98)	(2.00)	(−1.33)
NUMKIDS	−0.1041[a]	−0.1944[c]	−0.2374[a]	0.1272
	(−2.89)	(−1.86)	(−3.05)	(0.54)
OTHADULT	0.0315	−0.1732[a]	−0.0111	−0.2406[a]
	(0.71)	(−2.29)	(−0.18)	(−2.72)
SICKKIDS	−0.3084[c]	0.3236	−0.0035	−0.6058
	(−1.93)	(1.35)	(−0.01)	(−0.73)
UNHEALTHY	−0.3842[a]	0.2349	−0.9378[a]	−0.0501
	(−3.21)	(0.92)	(−4.87)	(−0.06)
MAX3YEAR	0.0687	−0.1182	−0.1318	−0.0313
	(0.98)	(−1.35)	(−0.90)	(−0.16)
FADTRAIN	−0.2293[a]	−0.0289	0.0057	−0.0576
	(−3.16)	(−0.19)	(0.04)	(−0.28)
METRO	0.0181	0.0461	0.0138	0.2479
	(0.28)	(0.51)	(0.11)	(1.27)
SOUTH	0.0393	0.2962[b]	0.0226	0.0372
	(0.41)	(2.01)	(0.12)	(0.14)
ADCGRANT	−0.0003	0.0003[c]	−0.0010	0.0007
	(−0.91)	(1.88)	(−1.46)	(0.53)
MEDSTATE	−0.4E-4	—	0.1E-4	—
	(−0.77)		(0.12)	
UNEMPL	−0.1446[a]	0.0262	−0.0836	−0.0265
	(−5.77)	(0.35)	(−1.58)	(−0.26)
AVGWAGE	−0.8719[a]	−0.4118	−0.6492	−0.0491
	(−2.94)	(−0.65)	(−1.04)	(−0.05)
Intercept	0.3661	−2.5233	−1.0421	−2.8352
	(0.46)	(−1.58)	(−0.69)	(−0.80)
ρ	−0.3703		−0.0336	
	(−0.44)		(− 0.02)	
Log-likelihood	−2193.3		− 591.15	

Notes: Estimated to construct the two-sample selection terms *LAMBDA*1 and *LAMBDA*2 used in the price of care equation. *t*-statistics are in parentheses.
[a] Significant at the 1% level.
[b] Significant at the 5% level.
[c] Significant at the 10% level.

TABLE B.3.—CHILD CARE PRICE EQUATION WITH BIVARIATE SELECTION CORRECTION

Variables	Married and Pay	Single and Pay
AGE	0.0196	0.0032
	(1.52)	(0.14)
NUMKIDS	0.2169[b]	0.1897
	(2.14)	(1.23)
NONWHITE	−0.3730[c]	−0.2122
	(−1.83)	(−0.85)
NONLABY	0.0002[a]	0.0001
	(3.93)	(0.75)
*KID*0_2	0.6376[c]	−0.5126
	(1.79)	(−0.76)
*KID*3_5	0.5390	−0.2068
	(1.49)	(−0.46)
*KID*13_17	−0.3756	0.1749
	(−1.32)	(0.29)
OTHADULT	0.0611	0.0466
	(0.32)	(0.30)
MAX3YEAR	0.0264	0.3315
	(0.18)	(1.58)
FADTRAIN	0.1396	−0.1923
	(1.08)	(−0.91)
METRO	0.3673[a]	0.0509
	(2.59)	(0.19)
SOUTH	0.1258	−0.2171
	(0.92)	(−0.91)
AVGWAGE	1.2668[a]	−0.9765
	(2.51)	(−1.12)
*LAMBDA*1	−0.3565	−1.0212
	(−0.61)	(−1.30)
*LAMBDA*2	−0.5556	0.0068
	(−1.34)	(0.01)
Intercept	−2.5074[a]	3.3958[c]
	(−2.45)	(1.75)
R^2	0.1766	0.1632

Notes: Estimated to construct the predicted price of care *PREDPRCR*. All used *PRCARE*1. *t*-statistics are in parentheses.

[a] Significant at the 1% level.

[b] Significant at the 5% level.

[c] Significant at the 10% level.

TABLE B.4.—STRUCTURAL LFP PROBIT COEFFICIENTS FOR MARRIED MOTHERS
ALTERNATIVE VERSIONS

	Connelly Replication	Univariate (Version 1)	*PRCARE*2 (Version 2)	Ribar's Specification (Version 3)	Ribar Replication (Version 4)
PREDPRCR	−0.3791[a]	−0.698	−0.400[a]	−0.785[a]	−0.494[a]
	(3.11)	(−3.23)	(−3.73)	(−3.92)	(−3.92)
	[−0.4196]	[−1.042]	[−0.952]	[−1.055]	[−0.893]
PREDWAGE	1.7933[a]	5.107[a]	5.986[a]	5.475[a]	5.475[a]
	(5.52)	(5.54)	(5.99)	(6.15)	(6.15)
	[1.1665]	[3.320]	[3.891]	[3.559]	[3.559]
NONLABY	−0.2E-7	−6E-5[a]	−6E-5[a]	5E-2	−0.9E-4[a]
	(−0.08)	(−4.07)	(−4.07)	(1.27)	(−6.92)
*KID*0_2	0.0358	−0.072	−0.841[a]	0.037	−0.617[a]
	(0.20)	(−0.50)	(−7.01)	(0.25)	(−7.81)
*KID*3_5	0.2415	0.115	−0.697[a]	0.238[c]	−0.542[a]
	(1.45)	(0.99)	(−4.74)	(1.88)	(−4.92)
AGE	−0.0237[a]	−0.408[a]	−0.512[a]	−0.443[a]	−0.458[a]
	(−3.95)	(−4.04)	(−4.67)	(−4.52)	(−4.63)
*AGE*2	−0.0480	0.005[a]	0.006[a]	0.006[a]	0.006[a]
	(−1.50)	(3.92)	(4.28)	(4.26)	(4.23)
YRSEDUC	−0.0480	−0.326[a]	−0.399[a]	−0.363	−0.353[a]
	(−1.50)	(−4.18)	(−4.73)	(−0.47)	(−4.71)
NONWHITE	−0.0300	−0.067	0.468[a]	−0.088	−0.205[b]
	(−0.10)	(−0.56)	(3.80)	(−0.80)	(2.20)
SICKKIDS	—	−0.316[b]	−0.318[b]	—	—
		(−2.07)	(−2.06)		
UNHEALTHY	—	−0.383[a]	−0.379[a]	—	—
		(−3.23)	(−3.18)		
METRO	−0.2459[b]	−0.819[a]	−1.163[a]	−0.849[a]	−1.137[a]
	(−2.12)	(−4.08)	(−5.67)	(−4.50)	(−5.89)
SOUTH	0.0700	0.088	−0.140	0.140[b]	−0.002
	(1.11)	(0.88)	(−1.63)	(2.06)	(−0.03)
ADCGRANT	—	−7E-5	−4E-4	—	—
		(−0.23)	(−1.57)		
MEDSTATE	—	−3E-6	−4E-5	—	—
		(−0.65)	(−0.94)		
*KIDS*13_17	—	0.035	0.135	−0.057	0.232[a]
		(0.33)	(1.52)	(−0.50)	(2.73)
NUMKIDS	—	0.274[a]	0.193[a]	0.290[a]	0.120[a]
		(3.47)	(3.28)	(3.92)	(2.40)
OTHADULT	—	0.092[b]	0.232[a]	0.081[c]	0.033
		(1.96)	(3.36)	(1.80)	(0.77)
FADTRAIN	—	—	—	−0.098	−0.004
				(−7.58)	(−0.07)
MAX3YEAR	—	—	—	0.080	−0.191[a]
				(1.23)	(−2.38)
Intercept	−0.4191[c]	5.819[a]	8.548 [a]	6.112[a]	7.841[a]
	(1.85)	(3.59)	(4.53)	(4.06)	(4.64)
Log likelihood	−1478.32	−1458.50	−1456.73	−1464.53	−1464.53

Notes: (1) *t*-statistics are in parentheses; derivatives are in brackets.

(2) Versions 1 through 3 represent one single change, with Kimmel version shown in table 3 as starting point. Version 1—switch to univariate sample selection correction in *PRCARE* equation; version 2—switch to *PREDPRCR* constructed from *PRCARE*2; version 3—switch to Ribar's equation specification (i.e., variables); version 4—full Ribar replication.

[a] Significant at the 1% level.

[b] Significant at the 5% level.

[c] Significant at the 10% level.

TABLE B.5.—STRUCTURAL LFP PROBIT COEFFICIENTS FOR SINGLE MOTHERS
ALTERNATIVE VERSIONS

	Connelly Replication	Univariate (Version 1)	*PRCARE*2 (Version 2)	Ribar's Specification (Version 3)	Ribar Replication (Version 4)
PREDPRCR	−0.443[b]	−0.224	−0.252	1.057[b]	−2.114[b]
	(−2.14)	(−0.70)	(−1.09)	(1.99)	(−1.98)
	[−0.540]	[−0.179]	[−0.430]	[1.383]	[−4.538]
PREDWAGE	1.829[a]	7.685[c]	10.723[b]	4.820	4.820
	(3.14)	(1.72)	(2.24)	(1.04)	(1.04)
	[1.235]	[5.184]	[7.234]	[3.253]	[3.253]
NONLABY	4E-5	2E-5	−4E-5	−8E-5	1E-5
	(1.05)	(0.36)	(−0.60)	(−1.22)	(0.22)
*KID*0_2	−0.379[a]	−0.307[c]	−0.372[a]	0.215	−2.976[b]
	(−2.67)	(−1.80)	(−2.51)	(0.69)	(−2.22)
*KID*3_5	−0.144	−0.080	−0.103	0.091	−2.040[b]
	(−1.14)	(−0.53)	(−0.79)	(0.54)	(−2.10)
AGE	−0.015	−0.459	−0.711[c]	−0.216	−0.212
	(−1.50)	(−1.30)	(−1.85)	(−0.59)	(−0.59)
*AGE*2	—	0.006	0.009[c]	0.002	0.002
		(1.29)	(1.82)	(0.53)	(0.53)
YRSEDUC	0.008	−0.365	−0.562[c]	−0.165	−0.165
	(0.16)	(−1.30)	(−1.83)	(−0.56)	(−0.56)
NONWHITE	−0.156	0.442	0.743	0.419	0.195
	(−1.06)	(0.85)	(1.51)	(0.73)	(0.38)
SICKKIDS	—	−0.031	−0.011	—	—
		(−0.10)	(−0.04)		
UNHEALTHY	—	−0.932[a]	−0.937[a]	—	—
		(−5.30)	(−5.29)		
METRO	−0.111	−0.443	−0.567[c]	−0.333	−0.279
	(−0.89)	(−1.40)	(−1.90)	(−1.04)	(−0.93)
SOUTH	0.122	0.233	0.371	0.660[a]	0.304
	(0.84)	(0.72)	(1.46)	(1.88)	(1.17)
ADCGRANT	—	−0.002 [a]	−0.001[b]	—	—
		(−2.91)	(−2.16)		
MEDSTATE	—	9E-6	−3E-5	—	—
		(0.01)	(−0.32)		
*KIDS*13_17	—	0.353[c]	0.361[b]	0.169	−0.736
		(1.93)	(2.02)	(0.84)	(−1.27)
NUMKIDS	—	−0.106	−0.063	−0.395[a]	−0.194[b]
		(−1.02)	(−0.52)	(−3.46)	(−2.16)
OTHADULT	—	−0.033	0.034	−0.035	0.014
		(0.52)	(0.46)	(−0.56)	(0.24)
FADTRAIN	—	—	—	0.261[b]	0.423[b]
				(2.10)	(2.64)
*MAX*3*YEAR*	—	—	—	−0.463[b]	0.447
				(−2.32)	(1.40)
Intercept	−1.284[b]	1.214	3.396	−3.239	6.365
	(−2.04)	(0.51)	(1.14)	(−1.52)	(1.18)
Log likelihood	−407.95	−386.18	−385.83	−401.38	−401.38

Notes: (1) *t*-statistics are in parentheses; derivatives are in brackets.

(2) Versions 1 through 3 represent one single change, with Kimmel version shown in table 3 as starting point. Version 1—switch to univariate sample selection correction in *PRCARE* equation; version 2—switch to *PREDPRCR* constructed from *PRCARE*2; version 3—switch to Ribar's equation specification (i.e., variables); version 4—full Ribar replication.

[a] Significant at the 1% level.

[b] Significant at the 5% level.

[c] Significant at the 10% level.