The Effect of Child Care Costs on the Labor Force Participation and Welfare Recipiency of Single Mothers: Implications for Welfare Reform

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Abstract

This paper considers the effect of child care costs on two labor market outcomes for single mothers—whether to participate in the labor market and whether to receive welfare. Hourly child care expenditures are estimated for all women in the sample (using data drawn from the 1992 and 1993 panels of the SIPP), whether or not they are currently using nonmaternal child care. These expenditures are then included as an independent variable predicting the probability of welfare recipiency and the probability of labor force participation. Results show a substantial positive effect of child care costs on welfare recipiency, with a child care price elasticity of welfare recipiency equaling 0.28. The estimated child care price elasticity of employment equals -0.76, showing that controlling for the welfare choice does not reduce the price elasticity of employment found in other studies. Simulations based on these data from 1994 show that welfare recipiency is reduced by approximately one-third and employment increased by approximately 50 percent when child care expenditures are subsidized by 50 percent—not a large subsidy considering that the weekly expenditure on child care was about $58. While this study relies on data collected prior to the 1996 federal welfare reform that block grants welfare dollars to the states, the results show the importance of child care to both the employment and welfare outcomes and imply that policymakers will continue to need to address child care concerns as state welfare policy evolves.

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For all mothers of young children, entering the labor market is strongly linked with the need for child care. Opportunities for caring for children while in the labor market are few in a developed economy. In many cases, the husband or another family member serves as caregiver, but approximately 50 percent of preschoolers with a working mother are cared for by nonrelatives (Casper 1997). Some of these arrangements involve a substantial amount of money. In 1993, the average weekly cost of care was $59 for home-based care, $68 for center-based care, and $48 for care provided by a relative. This can represent one-fourth of earnings for single mothers working full-time at the minimum wage (Kimmel 1994). Such substantial money expenditures coupled with transportation needs both to work and to daycare, as well as the uncertainty of many child care arrangements, is expected to keep many mothers of young children out of the labor market. Thus, the relationship between employment and child care for these mothers is thought to play a strong role in the link between welfare recipiency and child care.

Welfare programs before and after welfare reform have targeted child care as a barrier to employment.[1] Before welfare reform, child care subsidies were available to some recipients through federal Title IV-A funding sources for child care (AFDC/JOBS, At-Risk, Transitional Child Care) and through the Child Care Development Block Grant. These funds often came with matching requirements from the states. The Personal Responsibility and Work Opportunity Reconciliation Act of 1996 (PRWORA) consolidated all of these funds into state block grants,

[1]See Blau (2000) for a comprehensive discussion of child care subsidy programs.

thereby permitting the states to design their own child care assistance schemes. States may supplement federal child care block grants with state dollars, but there is no longer a required state match. Thus, while the total federal dollar amount allocated to child care in Temporary Assistance for Needy Families (TANF) exceeds former federal AFDC child care commitments, it is unclear what will happen over the long term to total child care expenditures as welfare reform evolves because TANF requires less in state matching expenditures. Early post-reform evidence suggests that while overall child care spending at the state level has increased, the increase is less than would have occurred had the matching requirements been retained. A recent study of welfare leavers reports that few are receiving subsidies (Schumacher and Greenberg 1999), and only 1.24 million of the approximately 10 million children eligible for federally funded support received assistance in 1997 (U.S. Dept. of HHS 1999).

Underlying states' expenditures on child care subsidies are their subsidy eligibility guidelines, participation in such subsidy programs by the eligible population, and availability of subsidized slots or funds for those families applying for such funds. Only a small percentage of families eligible for subsidies based on the federal maximum income limits receive such support. Federal guidelines as outlined in PRWORA stipulate that federally financed child care subsidies can be made available to families with incomes up to 85 percent of the state's median income. However, as of July 1999, only five states had set their eligibility guidelines at the federal maximum. In addition, participation by the state-defined eligible group is quite low, partially due to lack of information. City officials in San Francisco have used an innovative peer outreach program to increase participation by the eligible population, and by the start of the year 2000, the

city was enrolling 50 percent of the estimated eligible population, an enrollment rate twice the statewide average (Heymann 2000b).

Extensive data on post-TANF behavior are not yet available nor will they be for some time. However, there is some evidence that workers continue to report that availability and cost of child care are barriers to self-sufficiency. For example, the McKnight Foundation's recent survey found that 18 percent of employers report that their welfare-to-work workers face child care problems (Heymann 2000a).

This paper looks back to the relationship between AFDC recipiency and child care costs using data from the second half of 1994. It is offered not as a historical footnote but rather because child care costs will continue to be an important factor determining welfare participation in the post-welfare reform environment due to the low expected earnings of low-skilled workers and the high percentage of earned income that must be devoted to purchase reliable quality care. In addition to facilitating mothers' employment and thus reducing poverty and the need for income supplements, quality child care is also an important social concern in and of itself, given the strong link between quality child care and positive child outcomes, particularly for at-risk children. Finally, these data come from early in the 1990s economic expansion and thus represent a more diverse population of welfare recipients than more recent data would contain. Later in the 1990s, after the economic expansion broke historical records, state welfare caseloads had fallen so substantially (due both to welfare reform and the unusually strong economy) that the remaining caseload is over-represented by hard-to-place individuals with multiple (hard-to-quantify) barriers to employment (see, for example, Council of Economic Advisors 1997 and Ziliak et al. 2000). The earlier data permit the estimation of a link between child care costs and welfare recipiency

that is likely to be observed in future periods of more typical moderate economic expansion or contraction.

In this paper, we measure the effectiveness of child care assistance policies by considering explicitly the effect of the cost of child care on welfare recipiency. We find that AFDC recipiency and employment of single mothers are sensitive to the predicted hourly price of child care. The elasticity of recipiency with respect to the predicted price of child care is estimated to be 0.3 once the jointness of AFDC recipiency and employment are considered. The elasticity of employment with respect to the predicted price of child care is estimated to be -0.8, which is similar to what other studies of single mothers have found. Policy simulations show that substantial declines in AFDC and increases in employment could be achieved with modest means-tested child care subsidies available to all single mothers.

We begin with a summary of evidence concerning the importance of child care costs in the determination of welfare recipiency available from welfare-to-work programs, as well as a summary of the existing econometric evidence on this issue. Then, we summarize a theoretical model of labor force participation and welfare recipiency and estimate the model using data from 1994 obtained by merging overlapping interviews from the 1992 and 1993 panels of the Survey of Income and Program Participation (SIPP). Finally, we discuss policy simulations designed to enumerate more clearly the importance of child care costs to the welfare population.

Review of Existing Evidence

There is some evidence from evaluations of welfare-to-work demonstration projects of the importance of child care costs to employment and welfare recipiency, though the results are not

uniform. Using six measures of economic self-sufficiency, Robins (1988) tested the effect of having a child care center located in a public housing project. These measures included annual hours worked, annual earnings, the probability of employment, total family income, total welfare benefits received, and the probability of receiving any welfare benefit during the previous year. He found that if the center was large enough, the presence of the center had a significant positive effect on annual hours worked of the mother, the probability of working, annual earnings of the mother and annual family income, and a significant negative effect on the probability of receiving welfare, especially for families with children under age five.

Joesch (1991) used a sample of 200 AFDC recipients from Colorado in 1983. She estimated an hours equation for these recipients and found a negative relationship between child care price and hours worked. Berger and Black (1992) also found substantial effects on employment but no effect on hours worked from child care subsidies to unmarried low-income mothers in Kentucky. Moving from being on the waiting list to receiving a subsidy was estimated to increase the probability of employment by about 10 percent. These results were robust across a number of specifications, including correcting for the sample selection bias of both being on the waiting list in the first place and then being selected off the waiting list. However, the majority of Berger and Black's sample were not on AFDC given pre-subsidy employment rates of around 85 percent.

Bowen and Neenan (1993) found less positive effects of making child care available in promoting welfare independence of mothers currently on AFDC. Their article reports on a random assignment experiment in which the experimental group of 300 AFDC recipients with their youngest child between the ages of one and four received a letter offering them an assured

child care slot in a subsidized day care center at any time in the next year that they secure employment. The control group of AFDC recipients sought access to the same subsidy but were wait-listed for six to nine months. Many more of the experimental group did make inquiries about the center and ultimately enrolled their children in the center program, but there was no significant difference between the employment levels of the two groups. Bowen and Neenan concluded that child care is a necessary but not sufficient condition for moving mothers off of welfare. We would add to their conclusion that subsidized child care is neither necessary nor sufficient given the equal employment outcomes of the two groups.

Anderson and Levine (1999) reviewed evidence from several major welfare-to-work demonstration projects from the late 1980s and early 1990s that included child care components.[2] They wrote, "Although the confluence of services, mandates, and incentives in these demonstrations suggests caution is required in interpreting their results, based on this evidence it seems reasonable to conclude that subsidized child care may have a modest effect, at best, in increasing employment levels of very low-skilled, single mothers with small children." However, none of these demonstrations explicitly examined the importance of child care costs within an experimental framework (as the authors point out), so any conclusions relating to the importance of child care costs are tentative at best.

Minnesota's Family Investment Program (MFIP), which was included in Anderson and Levine's review, deserves extra scrutiny because new findings from the three-year follow-up study

[2]Their review included two evaluations of the "JOBS" program (California's GAIN and the National Evaluation of Welfare-to-Work Strategies), two evaluations of state programs implemented under federal waivers (Minnesota's Family Investment Program and Florida's Family Transition Program), and two evaluations targeted at teen mothers (the New Chance Demonstration and the Teenage Parent Demonstration).

(conducted with a desirable experimental design based on random assignment into MFIP or AFDC) have now been released. This program was an innovative program based on the dual (and often competing) goals of encouraging work and making work pay. It contained two key work incentive provisions, the second of which related to child care. MFIP paid child care costs directly to providers for all parents working or participating in employment-related activities. The AFDC reimbursement scheme differed because the parents paid the providers directly and were reimbursed later. According to the MFIP report summary (2000, p. 4), the practice of reimbursing the mother after the expenditure occurred may have hindered the mother's efforts to get and stay employed. Also, the AFDC reimbursement rules tend to discourage providers from accepting such subsidized clients due to the uncertainty of receiving payment. The third year follow-up report finds significant impacts in numerous areas, including employment rates and earnings of the MFIP approach.

Finally, Lemke et al. (2000) analyzed Massachusetts state data on current and former TANF recipients who also receive child care vouchers. They find that increased funding for child care subsidies and availability of full-day kindergarten are associated with increased probabilities that current and former welfare recipients will work.[3]

There is also a growing econometric literature relating child care costs to female employment, although the vast majority of papers focus on married mothers.[4] All find a

[3]This study has two serious limitations. First, only those currently receiving child care vouchers are included, making it difficult to draw conclusions about the importance of the availability of such vouchers in employment and training decisions. Second, the probit model of employment has as its alternative to employment, participation in formal training or education programs rather than the broader category of non-employment.

[4]Heckman (1974), Blau and Robins (1988), Ribar (1992, 1995), Connelly (1989, 1992), Averett, Peters, and Waldman (1997) and Kimmel (1998) have explored the effect of child care costs on married women's labor force participation in the United States. Gustafsson and Stafford (1988) estimated the effect of such costs on the

significant negative effect of child care costs on women's labor force participation, although the estimated child care price elasticity of employment ranges from about −0.2 to −0.9 in the literature. Kimmel (1998) compared married and unmarried women but found single women's employment elasticity to be lower than married women's.[5] Connelly and Kimmel (2000), Anderson and Levine (1999), and Han and Waldfogel (1998) also looked at differences across marital status. These three papers each use SIPP data from the early 1990 panels, and each finds evidence that the elasticity of single mother's employment with respect to child care costs is greater in absolute value than married mother's employment elasticity.

In a related paper, Houser and Dickert-Conlin (1998) used 1993 SIPP data in a complex microsimulation model of labor market and transfer program participation. They incorporate after-tax wages, transfer payments, and child care payments and examine married and single mothers separately (the former in order to discern secondary worker effects). Their simulations suggest that a 50 percent child care subsidy would increase the labor force participation of single parents by 2.9 percentage points, and that a 20 percent reduction in the AFDC guaranteed payment would increase the labor force participation of single parents by 1.6 percent and reduce their welfare transfer program participation by 1.2 percentage points. These results, although in the same direction as our findings, are much smaller.

There is some evidence concerning the differences in child care expenditures across marital status. Connelly (1989) compared the determinants of weekly child care expenditures for

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market work decision of the female partner in two-parent families in Sweden. And Powell (1997, 1998) and Cleveland, Gunderson, and Hyatt (1996) examined married women's employment in Canada, while Michalopoulos and Robins (2000a) compared Canada to the United States.

[5]Kimmel (1995) and Michalopoulos and Robins (2000b) limited their analysis to these effects for single mothers.

married and unmarried women with young children in the United States. She found that married and unmarried women differ substantially in the determinants of child care expenditures and in the effect of estimated child care costs on hours worked in the labor market. Unmarried mothers seem more sensitive to the price aspects of expenditures, while married mothers are more sensitive to the quality aspects.

The only three papers (two unpublished) in the literature that directly share our focus on child care costs and welfare recipiency using national databases are Connelly (1990), Kimmel (1995), and Crecelius and Lin (2000). Connelly used the 1984 panel of SIPP and found a small effect of child care costs on welfare recipiency, and Kimmel used a low-income subsample of a merged file from the 1987 and 1988 SIPP panels and found a nearly zero elasticity. Crecelius and Lin rely on data drawn from the 1988 PSID. Their model differs from ours in several ways. First, they estimate a joint model of employment/welfare participation that includes hours worked truncated at zero rather than an employment probit as we do. Previous child care studies have shown that the bulk of the behavioral "action" is in the discrete employment outcome rather than the continuous hours outcome. In addition, they incorporate information concerning inter-household time transfers, an interesting extension although there is no information included in the time transfer data concerning the purpose of these transfers.[6] Crecelius and Lin's main findings are a one percentage point reduction in the average probability of welfare receipt if all the mothers receive 20 hours of help weekly from relatives and friends. They also find that for each 10 cent

[6]Also, the point of including this information is that the receipt of uncompensated inter-household time transfers might influence hours worked or the probability of welfare receipt; however, other child care studies (see, for example, Connelly and Kimmel, 2000) have shown that while single mothers do utilize relative care more frequently than married mothers, the single mothers are more likely to pay for such care. Also, observed time transfers are more likely to suffer from endogeneity problems than measures of the availability of such transfers.

reduction in child care costs, there are 0.154 to 0.212 more hours worked per week. Our paper is similar in format to Connelly (1990) and Kimmel (1995), but it relies on more recent data and a more fully developed model and includes a more thorough policy discussion. Our contribution lies in our more comprehensive discussion of policy simulations derived from a more complete econometric model, with more clear linkages to the earlier literature.

Underlying Theoretical and Econometric Models

We begin with a simple model of individual decision making from which equations can be derived that represent the discrete choices about welfare recipiency and labor force participation of mothers with young children. In our model, we assume that mothers of young children seek to maximize their utility over goods and child services, subject to four constraints: a money budget constraint combining the mother's labor income and nonlabor income, a production function for child services, a mother's time constraint, and a child's time constraint. Child services are the commodity parents are consuming from their children; it could be companionship or love or pride in one's progeny. They are produced with a combination of the mother's time at home, the child's time with other caregivers, and money inputs. Total nonlabor income is the sum of family income from sources other than the mother's labor market participation and means-tied transfer income such as welfare payments. Mothers have three uses of their time: work in the labor market, time spent with children, and leisure. The child has two types of time: time with the mother, and time with a nonmaternal caregiver.

From this theoretical model, we derive two indirect utility functions that we use to contrast the utility levels associated with different welfare and employment states.[7] From this comparison, we derive estimating equations for AFDC participation and LFP in which both discrete dependent variables represent underlying continuous latent indices reflecting preferences for welfare recipiency and market work. Estimation of these equations using variants of the probit model produce estimates of the probabilities associated with employment and welfare recipiency.

Included among the factors affecting welfare recipiency and employment will be predicted child care expenditures, which are expected to be positively related to the probability of welfare receipt and negatively related to the probability of employment. Increased expenditures on child care lower a woman's effective wage in the labor market when she is not receiving AFDC. Also included among these variables will be her predicted wage (proxying potential earned income), nonlabor family income, dichotomous variables indicating that the mother is nonwhite or unhealthy or lives in an urban area, factors affecting the value of a woman's time at home (specifically, two dichotomous variables indicating whether the youngest child is aged 0–2, and whether there are two or more preschoolers in the family), the state's average Medicaid expenditures per enrollee, and the state's average monthly AFDC payment. We expect that the woman's wage will be negatively correlated with welfare receipt but positively associated with employment, while those variables that are positively correlated with the value of a mother's time

[7]See, for example, Blank (1985, 1989) and Crecelius and Lin (2000) for models employing this indirect utility approach to AFDC recipiency.

at home, particularly the number of young children in the family, will have the opposite effects on both outcomes.[8]

Estimating the welfare recipiency equation by itself will provide an initial look at the effect of child care costs on AFDC recipiency. However, estimating this equation alone ignores the interaction between AFDC recipiency and labor market participation. Because of kinks in the budget line caused by AFDC regulations, as well as possible discontinuities in hours of employment available and hours of child care available, it is reasonable to suspect that decisions about AFDC recipiency are made jointly with decisions to participate in the labor market. In other words, the error terms in the two equations are correlated. Jointly estimating these two equations is accomplished by estimating a bivariate probit with four possibilities corresponding to the following four groups shown in Table 2:

1) AFDC = 1 and LFP = 1,
2) AFDC = 1 and LFP = 0,
3) AFDC = 0 and LFP = 1, and
4) AFDC = 0 and LFP = 0.

Estimates of the bivariate probit model refine our understanding of the effect of child care expenditures on both AFDC recipiency and labor force participation of single mothers.

[8]Whatever exclusions we have imposed have been based on attempts to match the accepted norm in the established literature. Earlier research in this area has found substantial sensitivity in resulting elasticity estimates to changes in equation specification in the final LFP probit equation. One example is Kimmel (1998). We have reduced this sensitivity by estimating the earlier instrumenting equations using a sample of both married and single mothers. This tends to produce more reliable predicted wages and prices, thereby increasing the robustness of the final bivariate estimation results. Additionally, there has been little sensitivity in earlier research and in ours with respect to changes in specification in the instrumenting equations.

Description of the Data

The sample of single mothers with children aged five or younger used in this paper are drawn from a merged file from the 1992 and 1993 SIPP panels. The SIPP, which is conducted by the U.S. Bureau of the Census, is a large, nationally representative sample of households in the United States. In these two panels, SIPP respondents are interviewed every four months for nine interviews, and a special set of child care questions are asked at the sixth interview of the 1992 panel, which overlaps the same calendar time period as the third interview of the 1993 panel. In these overlapping child care interviews, which took place in the second half of 1994, currently employed respondents with children younger than six were asked a number of detailed questions regarding their child care utilization patterns and expenditures. Mothers of such young children are subject to strongly binding child time constraint; that is, these children must be cared for 24 hours of the day by either a parent or a non-parental child care provider. Thus, while some child care costs are also associated with older children, the labor market decisions of mothers with young children are the mostly likely to be affected by the costs of child care.

Table 1 presents the mean values of the variables included in the analysis for five categories of single mothers: all single mothers, those employed, those employed and paying for child care, single mothers receiving welfare payments, and single mothers not receiving welfare payments. Table 2 provides a more detailed breakdown of variable means using subgroups stratified by both welfare and employment status, which is the specific focus of this paper. First looking at Table 1, we see that 43 percent of the 1,523 women in our full sample are welfare recipients. Thirteen percent of the welfare recipients are employed in the labor market, while 73 percent of the nonrecipients are employed. Also, AFDC recipients are slightly younger than

nonrecipients (27.7 versus 28.2 years old) and have, on average, 11.2 years of education—more than one year fewer than the nonrecipients. The AFDC recipients have more children aged 0–2 and 3–5, are more likely than nonrecipients to be nonwhite, and are considerably more likely to live in poverty.

Employed single mothers are 28.5 years of age, on average, and have 12.5 years of education. Only 26 percent live in poverty, but two-thirds have income less than twice the poverty threshold. Approximately one-fourth work part-time, and 53 percent report paying for child care. The oldest single mothers are those who are employed and paying for child care, and this subgroup also reports the highest education levels, with 12.6 years of education. Focusing further on the issue of paying for child care, those single mothers employed and paying for care are a bit less likely to be nonwhite and less likely to live in poverty or receive welfare than all employed single mothers. Additionally, they are less likely to work part-time and they earn higher average hourly wages ($8.96 an hour versus $8.25 an hour).

Turning to Table 2, the working single mothers not reporting welfare recipiency are the oldest and have the most education and the lowest poverty rates. Their higher nonlabor income may indicate that they are more likely to be receiving child support payments. The other group with relatively higher nonlabor income is the group not employed and not on welfare. Some of these women are also receiving child support, but there is substantial variation among themselves as the high poverty rate indicates. Others may be queued for welfare, waiting for their savings to be depleted.

Looking now at the two employed subgroups in Table 2, note that the nonwelfare group is far less likely to be employed part-time and receives a considerably higher average hourly wage

($8.61 an hour versus $5.41 an hour). Also, note that while the welfare recipient group is less likely to pay for care (36 percent versus 56 percent), the recipient group pays a higher hourly price for child care. This may reflect the higher cost of part-time child care (see, for example, Connelly and Kimmel 2000) or the receipt of child care subsidies.

Table 3 provides additional detail concerning child care expenditures by particular mode for all single mothers, then the single mother group is broken down by recipiency status. Single mothers receiving welfare are more likely to rely on relative care and less likely to rely on center-based care. But recall that they are also more likely to work part-time, an employment state more often associated with this pattern of modal choice. Also, the welfare recipients are less likely to pay for relative care and less likely to pay for center-based care. Neither subgroups are very likely to pay for relative care. The welfare recipient subgroup's average weekly payment for center-based care is considerably higher than for those not receiving welfare, but note that only nine single mothers fit this category, a sample of insufficient size for a meaningful statistical comparison. For all single mothers, center-based care is the most expensive, followed by home-based care and relative care, respectively.

Measuring Child Care Costs and the Problem with Censored Data

Child care costs present a problem for the researcher in that they are often unknown unless the woman is engaged in market work. This is the case with the SIPP data. This situation is similar to that faced by researchers in terms of wages that are unobserved if the person is not employed. In addition to the problem of limited observation of the relevant variable, child care is complicated by the fact that many families do not pay the “market price” for child care. Nonprofit

centers are often subsidized in the form of free rent and require no return on investment capital. Relatives and friends may be willing to provide child care at a reduced price or at no charge, either because they receive in-kind payments or because they enjoy caring for the child.

How one approaches this problem depends in part on the information available and in part on the question one is trying to answer. Because the focus here is on the mother's decision, only the portion of the cost she pays is relevant. Thus, for the purpose of this paper, we are not concerned about the level of subsidy of suppliers' costs or the opportunity cost of a relative's time. Since we are interested in the effect of child care costs on welfare recipiency and employment, we use the cost of child care per hour of employment, not the cost per hour of child care used. This is the relevant decision variable for mothers of young children who are evaluating the costs and benefits of entering the labor market, with one alternative being receiving welfare.

Differences among families in their access to low-cost or no-cost care is a very pertinent issue for our problem. Using the average local market price of child care alone ignores substantial differences among families in access to below market child care. The problem is that there is no exogenously given price of child care. Instead, due to differences in family circumstances and location of residence, each individual faces her own exogenously given price. The approach we use follows from Heckman (1974), who estimated a price of child care for each woman given information about the availability of other potential caregivers. Finally, because child care costs differ based on the number and ages of young children in the family, we include variables measuring the number of children in fairly specific age categories that relate directly to child care

options available to children of various ages. Thus, our measure of child care costs is the predicted cost per hour of employment of child care for the youngest child in the family.[9]

The problem of censored data is handled using the methodology described by Tunali (1986) and first applied to the problem of child care by Connelly (1992). This is a bivariate sample selection correction akin to the well-known Heckit correction (Heckman 1976). This method has since been used by a number of researchers interested in estimating child care costs, including Kimmel (1995, 1998), Powell (1997, 1998), GAO (1994), Han and Waldfogel (1998), and Anderson and Levine (1999), among others. Hourly child care costs are estimated using information from all women, married or single, who are currently employed, taking into account both the selection in the employment decision and the large number of women who are employed but whose financial costs of child care are zero.[10] Child care expenditures (measured in natural logarithm form) were assumed to be a linear function of a set of individual and family and locational variables, which includes the number of children of various ages, the presence of other potential caregivers in the family, age, race, nonlabor income, region, and state child care regulation. The statistical technique used involves estimating a bivariate probit model predicting employment and nonzero expenditure for child care. The results of this bivariate probit are used to create the selection terms that are used in the second stage linear estimation of hourly expenditures. The results of the bivariate probit and other supporting estimations are also

[9] See Gelbach (1998) for a model of the natural experiment of having a child turn eligible for public school on employment of mothers.

[10] While we think this method of estimating child care costs has substantial benefits over alternatives such as average child care costs in the location of residence (not available with SIPP data), because of its acknowledgment of differences in the probability of paying for care, the disadvantage is that bivariate probits are quite sensitive to sample size. To increase the sample size used for estimating the bivariate probit, we included all women with young children (under age six) who are employed and paying for care.

presented in Appendix Table A. The coefficients estimated in this two-stage procedure are then used with the individual woman's characteristics to predict an hourly price of child care for each mother in the sample. This prediction is the unconditional expected price of child care, which accounts for the expected probability of paying for care as well as the expected cost of paid care.[11]

With predicted child care expenditures for the youngest child of each single mother, we can analyze how changes in the price of child care might affect the probability of participating in the labor market and the probability of AFDC receipt. We can also simulate "tied" programs, such as increased child care subsidies enacted in conjunction with lowered AFDC benefits. A set of policy simulations are discussed after our analysis of the main results.

Summary of Estimation

Our full estimation involves several steps which we summarize here. First, we must create the two predicted regressors (predicted child care prices and predicted wages). These are constructed with two different sets of preliminary regressions. To construct predicted wages, we first run a reduced form labor force participation probit equation to construct the single term Heckit correction term for inclusion in the wage equation. This Heckit correction addresses the econometric problem of sample selection resulting from estimating the wage equation only for those individuals with positive wages. Then we run the wage equation with this Heckit correction term, and use the results to construct predicted wages for each individual in the sample. To construct predicted prices, we first run a reduced form bivariate probit model that includes an

[11]See Connelly (1992) for the explicit derivation of the unconditional expected price.

LFP probit with a probit for paying for care. These results are then used to construct the two-termed correction measure for inclusion in the price of the child care equation. The results of this equation are used to construct predicted prices for each person in the sample.

Once we have the two generated regressors in hand, we run two versions of the full model. First, just to generate a starting point for future comparison, we estimate the structural AFDC probit model and then the structural LFP model, both run separately. Then we implement the full structural bivariate probit model and calculate price and wage elasticities. Our policy simulations and cost estimates are constructed from sample means and these final results.

Estimation and Simulation Results

Table 4 presents the results from single equation probit estimations in which the dependent variables are AFDC recipiency and employment. For AFDC recipiency, very similar results have been obtained from other data sets.[12] Nonwhite mothers, mothers who reside in urban areas, and mothers reporting poor health are more likely to receive AFDC. The state's average AFDC payment per enrollee is related positively to AFDC recipiency, but the average Medicaid expenditure per enrollee is related negatively.

The new finding of Table 4 is the effect of predicted child care expenditures on the probability of AFDC recipiency. As the theoretical model predicts, that effect is positive and significant, with a price elasticity of AFDC recipiency equal to 0.6. Controlling for the price of care, the predicted wage (a proxy for earned income in this equation) is related negatively to the

[12] Graham and Beller (1989) used the 1979 and 1982 March CPS, Blank (1989) used the National Medical Care Utilization and Expenditure Survey, and Crecelius and Lin (2000) used the 1988 PSID.

probability of welfare recipiency, with the wage elasticity equal to −1.2.[13] Those with higher nonlabor incomes are also less likely to receive welfare, while nonwhite or unhealthy mothers are more likely to receive welfare. Families in which the youngest child has one or more siblings under the age of six or those living in urban areas are also more likely to receive welfare.

Results for the single equation probit used to explain employment behavior is also consistent with *a priori* expectations. The child care price elasticity of employment equals −1.0, quite a large estimate but falling within the broad range of estimates found in the current literature. The wage elasticity equals 1.2, which is also consistent with previous findings of large employment elasticities for single mothers.[14] Nonlabor income does not have a statistically significant impact on the employment of these single mothers, but nonwhite mothers are less likely to be employed than are those mothers in families that have at least two children under the age of six.

To explore further the relationship between child care costs and single mothers' decision making, we estimated the welfare recipiency and employment probit equations jointly using a full bivariate probit model. To review, we estimate these two equations jointly because we believe that the choices concerning welfare recipiency and employment are made simultaneously and so ignoring this simultaneity reduces the reliability of the single equation results.[15] The results for this joint estimation are given in Table 5. As expected, the estimated correlation coefficient

[13] See Appendix Table B for the estimating equations for the predicted wage.

[14] See, for example, Kimmel (1998) and Connelly and Kimmel (2000).

[15] More specifically, any unobserved variable relevant to the AFDC outcome is also likely to be relevant to the LFP outcome. Joint estimation allows the error terms of the two equations to be correlated, improving the efficiency of the estimation process.

between the two equations' error terms is negative and significant. This suggests that unobserved factors that increase the probability of participating in the labor market decrease the probability of receiving AFDC.

Despite the significant negative correlation, the partial derivatives calculated from the coefficients from the AFDC equation estimated jointly with the employment equation have the same signs that were observed in the single equation results. However, the elasticities are reduced somewhat, with the child care price elasticity now equaling 0.3, nearly half the size as it was in the joint estimation. The wage elasticity of welfare recipiency is also smaller, now equaling -0.793.

In the employment equation results from the joint estimation, the partial derivatives are also the same sign as from the single equation estimates, but again the elasticities are somewhat smaller. Now the child care price elasticity of employment equals –0.8, and the wage elasticity of employment equals 0.8. It makes intuitive sense that the key elasticities have somewhat dampened effects when the welfare recipiency and employment decisions are considered jointly.[16]

Table 6 presents a set of simulations designed to assess the impact of child care subsidies on the probability of AFDC recipiency and on the probability of being employed. The simulations were done using the coefficient estimates of Table 5 and the actual characteristics of the 1,523 women in the sample. Row 2 shows that using the predicted child care expenses and the other actual characteristics of women in our sample, 39.9 percent of single mothers are predicted to receive AFDC and 43.4 percent are predicted to be employed. These baseline probabilities

[16]In previous research, we have included a 0-1 dummy indicating the presence of sick children in the household to capture some measure of the value of the mother's home time. However, inclusion of this measure either in the instrumenting equations or the final probit models does not affect the resulting elasticity estimates and the measure, just like a measure of own health, might suffer from "self"-reporting bias.

compare with the actual proportions in the data of 43 percent for AFDC recipiency and 48 percent for employment. If child care expenditures were subsidized 10 percent for all single mothers, the predicted level of AFDC recipiency falls to 37.9 percent and employment rises dramatically to 52.8 percent. A means-tested subsidy of 10 percent for all women below median annual income of $24,600 has little impact on the probability of receiving AFDC or being employed compared to the non-means-tested subsidy but would cost considerably less. Tying a means-tested 10 percent child care subsidy with a reduction in average AFDC receipts is successful in reducing AFDC recipiency from 38.3 percent to 34.7 percent but has almost no impact on employment. About the same reduction in the probability of receiving AFDC can be achieved with a child care subsidy of slightly more than 20 percent with the added benefit of increasing the probability of employment substantially (comparing rows 5 and 7).

With child care expenditures reduced to one-half for all single mothers, AFDC recipiency would fall further to 27.6 percent while employment is predicted to rise to 75.4 percent (row 10). Again, making the child care subsidy means tested has a relatively small effect compared to the universal subsidy with a large cost savings, and tying the child care subsidy to a reduction in average state benefits does not achieve the same employment levels (rows 11 and 12). Taken as a whole, these results of our simulations indicate that subsidizing child care costs for all single mothers may be an important policy tool leading to lower AFDC recipiency rates. These subsidies could be packaged with existing federal TANF program restrictions on length of total, lifetime welfare recipiency and work requirements to improve living standards for ex-recipients by helping to “make work pay.”

Table 7 shows the estimated annual savings in the total AFDC expenditures that would result from the lower AFDC recipiency rates alongside estimated annual costs of the subsidy. These are "back-of-envelope" calculations using each woman's predicted wage assuming full-time employment and full-time use of child care and predicted price of child care for the youngest child. Savings are accrued if the woman was predicted to be receiving AFDC in the baseline calculation and predicted to be not receiving AFDC in the simulation. Child care subsidy costs were accrued if the woman was predicted to be employed in the simulated scenario. The savings ignore potential savings from Medicaid, food stamps and other means-tested programs such as housing and potential gains of income tax dollars. The costs columns ignore the cost of a second or third child in the same family. Column 2 assumes that only single mothers' child care costs are subsidized and ignores increased governmental obligations from the earned income tax credit. Column 3 again assumes that only single mothers' child care costs are subsidized but included an estimated earned income tax credit for newly employed single mothers. Column 4 estimates the costs of a child care subsidy that would apply to all employed mothers of young children and included the earned income tax credit (EITC) costs for both single and married EITC eligible mothers. The number in column 5 represents the net cost of the subsidy comparing the cost calculations of column 4 with the AFDC derived savings of column 1. The results of column 5 compared with column 4 show that the net cost of a child care subsidy program is reduced by the savings from lower recipiency rates. Even without a reduction in AFDC benefits, the cost of subsidizing child care for low-income mothers appears to be low due to substantial savings from lower recipiency rates.

Conclusions

Single mothers differ from married mothers in the absence of the husband as a potential caregiver, in the absence of husband's income (except in the case of child support), and, in the under the now-outdated welfare laws, in the single mother's categorical eligibility for AFDC. Many papers have examined the effect of child care costs on the labor market decisions of mothers of young children. But our paper is one of only a few that looks specifically at the effect of child care costs on the decisions of single mothers concerning labor force participation and AFDC recipiency. In doing so, it seeks to answer the policy questions made so relevant first by the Family Support Act of 1988 and more recently by the Personal Responsibility Act of 1996: "Can subsidizing child care reduce the welfare dependency of single mothers"?

The answer seems to be an unequivocal yes. The results of the positive effect of predicted child care costs are robust to changes in the specification of the child care expenditure estimation and changes in the specification of the AFDC probit. The results remain when we jointly estimate the probability of AFDC recipiency with the probability of labor market participation. Simulations show that AFDC recipiency is reduced by 10 percentage points when child care expenditures are subsidized by 50 percent for women with annual incomes below the median and, equally importantly, employment is increased by more than 25 percentage points. While that sounds like a large subsidy, recall that the average weekly expenditure on child care is about $58. However, any program that was designed to address quality concerns would raise this average weekly cost. Availability would also be of concern, particularly for infants, and any solution to the availability problem could also increase overall subsidy costs. [17]

[17]For example, see Mach and Reagan (2000).

Finally, these simulations do not reflect a broad equilibrium system that would model reverberations of such a subsidy throughout the entire economy. Projection of the ultimate total impacts of such a policy is complicated and perhaps falls outside of what we can expect from data-based analysis. Yet the estimates presented in this paper do show the value of child care subsidies in encouraging self-sufficiency gained through market work.

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Table 1. Means and Standard Deviations for Demographic and Employment Variables[a]

Variables	Single Mothers				
	All	Not on welfare	On welfare	Employed	Employed and pays for care
Demographics:					
Age	28.01 (6.82)	28.24 (6.77)	27.70 (6.88)	28.48 (6.65)	28.56 (6.22)
Education	11.82 (2.12)	12.31 (2.04)	11.15 (2.04)	12.50 (1.96)	12.55 (2.11)
Nonlabor income	849.96 (1536.21)	1016.12 (1683.57)	625.41 (1277.11)	919.65 (1665.34)	849.56 (1577.61)
Number of children aged 0–2	0.59 (0.59)	0.55 (0.55)	0.65 (0.65)	0.50 (0.54)	0.52 (0.54)
Number of children aged 3–5	0.72 (0.63)	0.64 (0.58)	0.83 (0.68)	0.65 (0.56)	0.65 (0.57)
Nonwhite	0.39 (0.49)	0.33 (0.47)	0.48 (0.50)	0.35 (0.48)	0.32 (0.47)
Poverty	0.55 (0.50)	0.36 (0.48)	0.80 (0.40)	0.26 (0.44)	0.23 (0.42)
2 ×Poverty	0.80 (0.40)	0.71 (0.45)	0.93 (0.26)	0.67 (0.47)	0.62 (0.49)
Welfare	0.43 (0.49)	-	-	0.11 (0.32)	0.08 (0.27)
Employment:					
Proportion in LF	0.47 (0.50)	0.73 (0.45)	0.13 (0.33)	-	-
Part-time	-	-	-	0.27 (0.45)	0.20 (0.40)
Weekly work hours	-	-	-	35.60 (10.06)	37.16 (9.10)
Hourly wage	-	-	-	8.25 (5.43)	8.96 (6.11)
Proportion paying for care	-	-	-	0.53 (0.50)	1.00
Weekly child care for youngest child ($)	-	-	-	-	57.58 (33.70)
Hourly child care for youngest child ($)	-	-	-	-	1.65 (1.20)
Number of observations	1,523	912	611	738	395

[a]These means and standard deviations are weighted to obtain population averages using the"topical module" weights supplied by SIPP.

Note: Standard deviations are shown in parentheses.

Table 2. Means and Standard Deviations for Demographic and Employment Variables by Employment and Welfare Status[a]

Variables	Employed		Not Employed	
	Yes on welfare	Not on welfare	On welfare	Not on welfare
Demographics:				
Age	28.12	28.53	27.64	27.47
	(7.51)	(6.52)	(6.78)	(7.33)
Education	11.77	12.59	11.06	11.57
	(1.70)	(1.97)	(2.07)	(2.04)
Nonlabor income	659.35	953.42	620.44	1183.69
	(1378.94)	(1696.05)	(1261.45)	(1638.04)
Number of children aged 0–2	0.52	0.50	0.67	0.69
	(0.56)	(0.54)	(0.65)	(0.55)
Number of children aged 3–5	0.60	0.66	0.86	0.59
	(0.53)	(0.56)	(0.69)	(0.62)
Nonwhite	0.43	0.34	0.48	0.29
	(0.49)	(0.47)	(0.50)	(0.45)
Poverty	0.57	0.22	0.83	0.74
	(0.50)	(0.41)	(0.37)	(0.44)
2 ×Poverty	0.85	0.65	0.94	0.88
	(0.36)	(0.48)	(0.24)	(0.32)
Employment:				
Part-time	0.58	0.23	-	-
	(0.49)	(0.42)		
Weekly work hours	28.28	36.55	-	-
	(13.06)	(9.18)		
Hourly wage	5.41	8.61	-	-
	(2.45)	(5.60)		
Child care:				
Proportion paying for care	0.36	0.56	-	-
	(0.48)	(0.50)		
Weekly child care for youngest child ($)	61.91	57.22	-	-
	(39.37)	(35.35)		
Hourly child care for youngest child ($)	2.46	1.59	-	-
	(2.08)	(1.06)		
Number of observations	79	659	532	253

[a]These means and standard deviations are weighted to obtain population averages using the"topical module" weights supplied by SIPP.

Note: Standard deviations are shown in parentheses.

Table 3. Child Care Mode Choice and Weekly Expenditures by Mode of Care for Employed Single Mothers[a]

	All	On Welfare	Not on welfare
Weekly expenditure on child care for each mode for those who pay for care ($)			
Relative care	48.06	58.62	47.21
Home-based care	59.27	49.98	60.41
Center-based care	68.38	97.32	66.59
Percentage using each child care mode:			
Relative care (Number of observations)	44.78 (325)	54.73 (42)	43.49 (283)
Home-based care (Number of observations)	17.40 (133)	17.65 (16)	17.37 (117)
Center-based care (Number of observations)	37.82 (280)	27.62 (21)	39.14 (259)
Of those who use each mode, percentage who pay for it:			
Relative care (Number of observations)	27.65 (88)	14.67 (6)	29.77 (82)
Home-based care (Number of observations)	90.51 (121)	85.04 (14)	91.23 (107)
Center-based care (Number of observations)	66.48 (186)	46.19 (9)	68.33 (177)

[a] These means are weighted to obtain population averages using the"topical module" weights supplied by SIPP. All numbers relate to care arrangements for each employed mother's youngest child except for weekly expenditure figures or where indicated otherwise.

Table 4. Marginal Effects From the Single Equation Probit Models for Employment and Welfare Recipiency

	Welfare	Employment
Predicted child care price	0.221**	−0.499***
	(2.01)	(−3.33)
	[0.551]	[−1.030]
Predicted wage	−0.471***	0.596***
	(−9.42)	(9.93)
	[−1.174]	[1.230]
Nonlabor income	−5E-5***	3E-5***
	(−5.00)	(3.00)
Nonwhite	0.179***	-0.140***
	(5.97)	(−4.67)
Unhealthy	0.071*	−0.064
	(1.78)	(−1.28)
Youngest child is an infant	−0.056	0.005
	(0.19)	(0.02)
Presence of two or more preschoolers	0.105***	−0.055
	(2.62)	(−1.10)
Urban residence	0.045	−0.034
	(1.50)	(−0.85)
Southern residence	0.004	0.056
	(0.02)	(1.40)
States' average Medicaid per enrollee	−1E-5	−3E-6
	(−1.00)	(−0.30)
State's average monthly AFDC payment	6E−4***	−1E−4
	(3.00)	(−0.5)
Constant	0.341***	−0.735***
	(3.10)	(−6.12)

Notes: *T*-statistics are in parentheses and elasticities are in brackets.
Significance level: * = 10%, ** = 5%, *** = 1%.

Table 5. Marginal Effects From the Bivariate Probit Model of Employment and Welfare Recipiency

	Welfare	Employment
Predicted child care price	0.112***	−0.368***
	(3.18)	(−2.96)
	[0.279]	[−0.759]
Predicted wage	−0.318***	0.405***
	(−9.84)	(9.61)
	[−0.793]	[0.836]
Nonlabor income	−4E-5***	1E−5***
	(−5.17)	(2.60)
Nonwhite	0.135***	−0.084***
	(5.42)	(−3.71)
Unhealthy	0.052	−0.040
	(1.52)	(−1.28)
Youngest child is an infant	−0.048*	−0.005
	(−1.72)	(0.15)
Presence of two or more preschoolers	0.084***	−0.027
	(2.50)	(−0.97)
Urban residence	0.034	−0.020
	(1.26)	(−0.89)
Southern residence	0.013	0.046
	(0.08)	(1.18)
States' average Medicaid expenditure per enrollee	−1E−5	−5E-6
	(−1.17)	(−0.20)
State's average monthly AFDC payment per family	5E−4***	−2E-6
	(3.69)	(−0.72)
Constant	0.179***	−0.539***
	(3.18)	(−5.33)
ñ	−0.309***	
	(−6.51)	

Notes: *T*-statistics relating to the estimated coefficient are in parentheses, and elasticities are in brackets.
Significance level: * = 10%, ** = 5%, *** = 1%.

Table 6. Simulation Results

Row		Predicted probability of receiving AFDC (%)	Predicted probability of being employed (%)
1	Actual data means	43.0	47.9
2	Baseline predictions from bivariate probit model (Table 5)	39.9	43.4
3	10% Subsidy of predicted hourly child care cost (Pcc)	37.9	52.8
4	10% Subsidy of Pcc for those below median predicted annual income	38.3	51.8
5	10% Subsidy of Pcc for those below median predicted annual income and 20% reduction in average AFDC benefits in state of residence	34.7	52.6
6	20% reduction in average AFDC benefits only	36.2	49.1
7	20% Subsidy of predicted hourly child care cost (Pcc)	35.7	57.8
8	20% Subsidy of Pcc for those below median predicted annual income	36.6	55.6
9	20% Subsidy of Pcc for those below median predicted annual income and 20% reduction in average AFDC benefits in state of residence	33.1	56.4
10	50% Subsidy of predicted hourly child care cost (Pcc)	27.6	75.4
11	50% Subsidy of Pcc for those below median predicted annual income	30.0	69.4
12	50% Subsidy of Pcc for those below median predicted annual income and 20% reduction in average AFDC benefits in state of residence	26.7	70.1

Notes: Simulations were done using actual characteristics of the 1,523 single mothers except for the predicted price of child care. The predicted price of child care was reduced for the given percentage for each woman in the sample in lines 4, 7, and 10. In simulation 5, 8, and 11, a predicted income is calculated using the predicted wage and assuming 2,000 hours of employment. The predicted price of child care was reduced for any woman in the sample with a predicted income less than $24,800 per year. Simulations 6, 9, and 12 also simulate a 20% reduction in every state's average AFDC benefit.

Table 7. Cost Simulation Results

	Predicted annual savings from reduction of AFDC recipiency and/or reduction in recipient amounts (in millions)	Predicted annual cost of the subsidy for single women only (in millions)	Predicted annual cost of the subsidy for single women only plus extra EITC	Predicted annual cost of the subsidy for all women plus extra EITC	Net cost of the child care subsidy cost -savings (in millions) column 1 minus column 4
10% Subsidy of predicted hourly child care cost(Pcc)	589.0	603.8	1205.1	3925.2	-3336.2
10% Subsidy of Pcc for those below median predicted annual income	547.8	441.7	1043.0	1418.6	-870.8
10% Subsidy of Pcc for those below median predicted annual income and 20% reduction in average AFDC benefits in state of residence	1816.6	455.8	1166.4	1581.4	235.2
20% reduction in average AFDC benefits only	1325.8	--	110.7	121.5	1204.3
20% Subsidy of predicted hourly child care cost (Pcc)	1245.4	1404.7	2559.8	8480.2	-7234.8
20% Subsidy of Pcc for those below median predicted annual income	1129.4	1026.7	2181.8	3028.1	-1898.7
20% Subsidy of Pcc for those below median predicted annual income and 20% reduction in average AFDC benefits in state of residence	2273.6	1045.9	2284.5	3150.9	-877.3
50% Subsidy of predicted hourly child care cost (Pcc)	3567.2	4776.2	7565.2	25277.7	-21710.5
50% Subsidy of Pcc for those below median predicted annual income	3232.9	3606.5	6395.5	8934.7	-5701.8
50% Subsidy of Pcc for those below median predicted annual income and 20% reduction in average AFDC benefits in state of residence	4020.0	3635.5	6463.5	9026.1	-5006.1

Notes: Simulated costs of columns 1, 2, and 3 are based on actual characteristics of 1,523 single mothers weighted with the wave weights and the estimated coefficients of Table 5. Costs are added in terms of subsidized child care if the woman was predicted to be employed Y*>.5. Savings were added in terms of AFDC savings if the predicted probability of receiving AFDC is >.5 in the baseline prediction and <.5 with the simulated values. Column 4 added the simulated costs of the child care subsidy for married women using our married women sample and coefficients for the probability of employment. Columns 3 and 4 also estimate the increase in Earned Income Tax Credits due to increased employment probability of low-income (EITC eligible) families, assuming our predicted wage if employed and 2,000 hours of employment.

Appendix Table A. Determinants of the Probability of Paying for the Primary Child Care Arrangement of the Youngest Child and the Amount Paid for that Care

Variable	Pay for care (*n*=5764)	Natural logarithm of hourly price of child care (*n*=1677)
Education	0.886	0.033***
	(1.86)*	(2.76)
Age	0.076***	0.016***
	(2.97)	(4.77)
Nonwhite	−0.066**	−0.123**
	(−2.47)	(−2.37)
Nonlabor income	0.001**	0.000***
	(2.36)	(2.77)
Youngest child is an infant	0.078***	0.099**
	(3.40)	(2.00)
Number of other preschoolers	0.044	0.244***
	(1.43)	(5.29)
Number of children aged 6–12	−0.008	-
	(−0.41)	
Presence of children aged 6–12	-	−0.136***
		(−3.38)
Presence of children aged 13–17	0.003	−0.167***
	(0.07)	(−2.64)
Presence of other adults	−0.127***	−0.119
	(−4.28)	(−1.27)
Unhealthy	0.038	-
	(0.84)	
Urban residence	-0.068***	0.167***
	(-3.00)	(3.59)
Southern residence	0.069**	0.002
	(2.08)	(0.03)
State's regulated child:staff ratio <10:1	0.006	0.099**
	(0.24)	(2.48)
State regulated center teachers' education	−0.009	0.089**
	(−0.39)	(2.28)
State's average Medicaid expenditure per enrollee	−0.003	0.000
	(−2.58)	(0.61)
State's average monthly AFDC payment per family	1E−4	4E−4*
	(1.10)	(1.91)
Married	−0.123***	0.067
	(−4.37)	(0.74)
Correlation coefficient	−0.687***	-
	(−5.22)	
ë from YESPAY	-	−0.031
		(−0.09)
ë from employment	-	0.039
		(0.23)
Adjusted R^2	-	0.233
Constant	−0.946**	−0.981***
	(−2.30)	(−3.57)

Notes: Table values are partial derivatives from bivariate probit for YESPAY, and coefficients from the OLS Price Equation *T*-statistics are in parentheses. Significance level: * = 10%, ** = 5%, *** = 1%. These results are used to construct the predicted price of child care for each mother in the sample, which is used in the models presented in Tables 4 and 5.

Appendix Table B. Determinants of the Probability of Being Employed and the Hourly Wages (Probit Model for Employment and OLS Selection Equation for Hourly Wages)

Variable	Employment (*n*=5764)	Natural logarithm of hourly wage (*n*=3088)
Education	0.186*	0.108***
	(1.92)	(16.25)
Age	0.178***	0.132***
	(3.67)	(7.01)
Age^2	−0.003***	−0.002***
	(−3.60)	(-5.67)
Education^2	−2E−4	-
	(0.06)	
Education * age	−0.009**	-
	(−2.10)	
Education * age^2	1E−4**	-
	(2.17)	
Education^2 * age	1E−5	-
	(0.12)	
Nonwhite	−0.027	−0.031
	(−1.36)	(−0.92)
Unhealthy	−0.190***	−0.245***
	(−6.69)	(3.90)
Nonlabor income	−4E−5***	-
	(−9.93)	
Number of children	−0.099***	−0.120***
	(−10.64)	(−6.43)
Number of children aged 0–2	−0.097***	-
	(−6.05)	
Number of children aged 3–5	−0.076***	-
	(−4.64)	
Presence of children aged 13–17	0.129***	-
	(4.76)	
Presence of other adults	0.070***	-
	(3.32)	
Urban residence	−0.003	0.114***
	(−0.18)	(4.14)
Southern residence	−0.008	−0.051**
	(−0.33)	(−1.98)
Unemployment rate	−0.031***	0.020*
	(−4.02)	(1.73)
State's regulated child: staff ratio <10:1	0.005	-
	(0.22)	
State regulates center teachers' education	0.041**	-
	(2.45)	
State's average Medicaid expenditure per enrolled	−2E−5***	-
	(−2.83)	
State's average monthly AFDC payment per family	2E-5	-
	(0.18)	
Employers estimated workers' compensation payments by state	–7E−4	−0.003
	(−0.05)	(−0.18)

Appendix Table B. (Continued)

Variable	Employment (*n*=5764)	Natural logarithm of hourly wage (*n*=3088)
Married	0.077***	0.057*
	(3.79)	(1.90)
Lambda	-	0.438***
		(5.284)
Adjusted R^2	-	0.266
Constant	−2.748***	−1.989***
	(−3.26)	(−6.07)

Notes: Table values are partial derivatives from the employment probit equation and coefficients from the OLS (ln)wage average equation. *T*-statistics are in parentheses. Significance level * = 10%; ** = 5%; *** = 1%. These results are used to construct the predicted wage for each mother in the sample, which is used in the models presented in Tables 4 and 5.