NBER WORKING PAPER SERIES

SINGLE MOTHERS WORKING AT NIGHT: STANDARD WORK, CHILD CARE SUBSIDIES, AND IMPLICATIONS FOR WELFARE REFORM

Erdal Tekin

Working Paper 10274
http://www.nber.org/papers/w10274

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
January 2004

I would like to thank David Ribar for his helpful comments. Research for this study was supported by a grant from the Association for Public Policy Analysis and Management. All errors are mine. Comments welcome at tekin@gsu.edu. The views expressed herein are those of the authors and not necessarily those of the National Bureau of Economic Research.

Single Mothers Working at Night: Standard Work, Child Care Subsidies, and Implications for Welfare Reform

Erdal Tekin

NBER Working Paper No. 10274
January 2004
JEL No. J13, I38

ABSTRACT

Using a data set from the post welfare reform environment (the 1999 National Survey of America's Families), this paper investigates the impact of child care subsidies on the standard work (i.e., work performed during the traditional work hours of 8 a.m. and 6 p.m. through Monday and Friday) decision of single mothers and tests whether this impact differs between welfare recipients and nonrecipients. The econometric strategy accounts for sample selection into the labor force and the potential endogeneity of child care subsidy receipt and welfare participation. Results suggest that child care subsidies are associated with a 6 percentage point increase in the probability of single mothers working at standard jobs. When the impact of subsidies is allowed to differ between welfare recipients and non-recipients, results indicate that welfare recipients are 14 percentage points more likely to work at standard jobs than others when they are offered a child care subsidy. Among non-recipients, child care subsidies increase standard work probability by only 1 percentage point. These results underscore the importance of child care subsidies helping low-income parents, especially welfare recipients, find jobs with conventional or standard schedules and lend support to the current practice of states' giving priority to welfare recipients for child care subsidies. Results are found to be robust to numerous specification checks.

Erdal Tekin
Department of Economics
Georgia State University
University Plaza
Atlanta, GA 30303-3083
and NBER
tekin@gsu.edu

I. Introduction

Working outside the "standard" weekday hours of 8 a.m. to 6 p.m. between Monday and Friday is an increasingly common practice in the United States. For example, 34.3% of all female workers in the United States were nonstandard workers in 1995 (Kalleberg et al. 1997). The investigation of nonstandard work is important for a number of reasons. First, there is evidence suggesting that workers engaged in nonstandard work are more likely to be assigned to routine jobs, and to receive less training and fewer promotions than others (Rothstein 1996; Barker 1993; Tilly 1996). Consequently, these workers tend to earn less, and are less likely to have health insurance and pension benefits than standard workers (Hipple and Stewart 1996; Loprest 2002). Along similar lines, there appears to exist a positive link between the quality of an initial job and the likelihood of maintaining employment over time (Rangarajan, Schochet, and Chu 1998; Strawn and Morrison 2000; Cancian and Meyer 2000). Second, nonstandard work is linked to a number of adverse outcomes for parents and children, such as work and family conflicts, marital instability, health problems for both parents and children, and poor educational outcomes for children (Staines and Pleck 1983; Presser 2000; Heymann 2000). Finally, the majority of nonstandard workers work such schedules involuntarily and view their employment during nonstandard hours as an accommodation to labor market needs, not as a personal preference. According to Current Population Survey, more than half of the workers with nonstandard schedules report the nature of the job as the reason for their choice. Only about six percent of nonstandard workers report working such schedules for better pay and only four percent give better child care as their reason for working nonstandard schedules (Beers 2000).

With the passage of welfare reform in 1996, child care assistance has become a significant tool for helping welfare recipients move into the workforce and for helping other low-income families stay off welfare.[1] According to the General Accounting Office, a vast majority of states make welfare recipients and families making the transition from welfare to work eligible for child care assistance or give them higher priority than other low-income families when resources are insufficient to cover all who apply (GAO 2003). Almost seven years after the welfare reform bill, Congress now debates legislation to reauthorize welfare reform, and child care funding remains a key issue. However, very little is known about whether child care subsidies have in fact played a role in increasing employment among welfare recipients, or in general, low income population in the post-welfare reform period (Blank 2002). Even less is known about the effect of these subsidies on standard-nonstandard employment decisions of these individuals. This paper is an attempt to fill this gap.

Since the passage of welfare reform, the employment rate of single mothers has risen dramatically (Jones-DeWeer et al. 2003). However, leaving welfare does not necessarily mean gaining adequate work and increasing economic self-sufficiency. For example, only eight percent of welfare leavers have been able to sustain employment over a period of four years (Martinson 2000). Over three quarters (78%) of employed low income single mothers are concentrated in typically low-wage and low benefit occupations. (Jones-DeWeer et al. 2003). These occupations typically demand a greater

[1] The welfare reform legislation combined the previously existing four child care funding programs into the Child Care Development Fund (CCDF) and increased federal funding for child care substantially. It also gave states greater flexibility in setting up and administering their programs. In fiscal year 1999, states spent all of their CCDF allocation of around $5 billion and spent directly on child care or transferred another $4 billion from the TANF funds. See Blau (2003) for a summary of the system of child care assistance under welfare reform.

number of hours outside the standard weekday times of 8 a.m. to 6 p.m.[2] About one quarter of all welfare leavers worked night shifts or had irregular schedules on a regular basis in 1999 (Loprest 2002). Despite gains in employment, about 52 percent of those who left welfare in 1999 had incomes below the poverty level (Nightingale 2002). In sum, welfare reform may have been successful so far in helping welfare participants secure entry-level jobs; however, there is a great deal of concern over the possibility that many former welfare recipients who have gone to work are having difficulty finding stable employment and working at jobs with low wages and few benefits. This paper examines the capability of child care subsidies to help mothers find jobs with conventional or standard schedules, the kind of jobs that usually pay higher wages, provide better benefits, and lead to long-term economic well-being of parents.

A binary model of standard-nonstandard employment is estimated jointly with the binary models of subsidy receipt and labor force participation to control for endogeneity and selectivity, using full information maximum likelihood (FIML). In order to test for a differential effect of subsidy receipt on standard work across welfare recipients and nonrecipients, the system of equations is re-estimated with the addition of an interaction of a welfare and subsidy indicator into the standard work model, controlling for the endogeneity of welfare receipt. Investigation of whether the effect of child care subsidies differs between welfare recipients and nonrecipients is particularly important because many states indicate that they give priority to families leaving welfare (Schumacher and Greenberg 1999).[3] The analysis uses data from the 1999 National Survey of America's

[2] It is important to note that the term "nonstandard" is not used to describe workers who are employed on a temporary basis. Rather it refers to the individual's reported work schedule.
[3] Prior to 1996, welfare recipients had the priority. This is no longer a requirement under federal law, although it is still often the case in practice.

Families (NSAF), conducted by the Urban Institute. The NSAF provides the only available national household data from the post-welfare reform period with information on child care subsidies.

The rest of the paper is organized in the following way. Section II reviews the previous literature. Section III describes the theoretical model and discusses the econometric approach. Section IV introduces the data. Section V presents the results and section VI concludes the paper.

II. Previous Literature

Although this is the first paper to examine the impact of child care subsidies on standard work decision, it is not the first to consider the relationship between child care subsidies and employment of mothers. However, the vast majority of the literature on the impact of child care subsidies on employment focuses on the pre-welfare reform period. Due to the fact that the welfare reform changed the system dramatically, results from the pre-welfare reform period may be less relevant to the impact of current subsidies (Blau and Tekin 2003).

One body of evidence on the association between child care subsidies and employment comes from several demonstration projects designed to help economically disadvantaged families. These programs include child care subsidies along with other benefits and services. Most of these projects were conducted as randomized experiments prior to the 1996 welfare reform legislation and they typically find that employment increased as a result of the treatment. However, the child care subsidy is only one of a

large number of services and benefits provided to the treatment group, therefore, it is not possible to isolate the actual subsidy impact from the overall program impact.[4]

The largest source of evidence on the effect of child care subsidies on employment comes from the studies on the impact of the price of child care. These studies typically use the variation in child care costs across individuals and the geographic variation in the cost of child care.[5] They studies implicitly rely on the strong assumption that there are no costs to taking up a subsidy either in the form of time costs required to deal with the bureaucratic system or the stigma of participating a means-tested program. If this assumption is not true however, then the price effect would not be a reliable estimate for the subsidy effect and the decision to take up a subsidy must be treated as an endogenous decision (Blau 2003).

Research on the impact of *actual* subsidies has been limited, primarily due to lack of data. Berger and Black (1992) and Gelbach (2002) examine the effect of child care subsidies by comparing the employment patterns of two groups of mothers who are separated from each other using a natural experiment. Both of these studies find positive impacts of child care subsidies on maternal employment. Meyers, Heintze, and Wolf (2002) use data from a sample of low income single mothers (current and recent welfare recipients in California between 1992 and 1995) to estimate the probability of their receiving child care subsidies and the effect of this probability on labor market activity. The authors find that the probability of subsidy receipt is associated with an increase in the probability of employment. Blau and Tekin (2003) analyze the determinants of

[4] Several examples of these demonstration projects are New Hope (Bos et al. 1999), the Teenage Parent Demonstration (Kisker et al. 1998), New Chance (Quint, Bos, and Polit 1997), GAIN in California (Riccio et al. 1994), the Minnesota Family Investment Program (Miller et al. 1997), and the Florida Family Transition Program (Bloom et al. 1999).

[5] See Anderson and Levine (2000) for a summary of these studies.

receipt of child care subsidy and the effect of subsidy receipt on employment, unemployment, school attendance and welfare participation, using data from the NSAF. The authors control for the endogeneity of child care subsidy receipt using instrumental variables. They find positive effects of child care subsidy receipt on employment.

The information on the link between the standard/nonstandard work and child care decisions of mothers is very limited and mostly descriptive in nature. Authors typically consider the impact of standard or nonstandard work on several outcomes such as modes of child care and the decision to use a child care subsidy (Burstein et al. 2001; Georges et al. 2001; Presser 1986; Presser 1988; Brayfield 1995; Casper and O'Connell 1998; Chaplin et al. 1999; Kimmel and Powell 2001; Kimmel and Powell 2002). An important difference between this paper and previous research in this area is that the focus here is on the standard/nonstandard work decision while previous studies concentrated on the effect of standard or nonstandard work on some other outcome measure. With the exception of the two studies by Kimmel and Powell, none of them addressed the endogeneity of standard/nonstandard work status. Kimmel and Powell (2001) examine the impact of standard work on the child care choices of single mothers and find that work patterns play an important role in mothers' decisions regarding the mode of child care.

III. Theoretical Model and Econometric Framework

The behavioral model developed in this section serves as a guide for the econometric model used for estimating the impact of child care subsidies on standard employment. Suppose that a single mother allocates her time between leisure and work.

She either works during standard hours or nonstandard hours but not both. If she does not work, she provides child care during her leisure hours. During her work hours, she can use market care or receive free care from a relative. The relative allocates her time between child care and leisure with employment ruled out for simplicity. Although the choice of paid versus unpaid care or the employment decision of the relative are not part of the empirical model, they are included in the theory in order to account for the use of unpaid child care (Blau and Tekin 2003). The mother can receive a child care subsidy if she is eligible for one. In addition to satisfying the income condition, she must either be employed or in a work-related activity to be eligible for a subsidy as required by the law. Furthermore, child care subsidies are conditioned on the use of market care. To the extent that such arrangements lack flexible hours, they might not be attractive to mothers working nonstandard hours. This would in fact serve as another factor supporting the claim that subsidy receipt is endogenous. Finally, it is assumed that the mother may derive disutility from receiving a child care subsidy as a result of stigma.

Under these assumptions, a mother maximizes her utility subject to her budget and time constraints, which can be expressed as follows:

$$U = U(C, d_{st}H_{st}+(1-d_{st})H_{nst}, L_r, q_s s)$$

$$L_m + d_{st}H_{st} + (1-d_{st})H_{nst} = 1, \qquad L_r + J = 1,$$

$$M + J = d_{st}H_{st} + (1-d_{st})H_{nst}, \qquad JM = H_{st}H_{nst} = 0$$

$$C + pM = Y + [d_{st}H_{st} + (1-d_{st})H_{nst}]w \qquad \text{if } s=0$$

$$C + (p-r)M = Y + [d_{st}H_{st} + (1-d_{st})H_{nst}]w(1-t_s), \qquad \text{if } s=1,\ Y + hw \le E_s, \text{ and } T_s=1$$

where

U	=	utility
C	=	consumption
d_{st}	=	binary indicator of standard work
H_{st}	=	work hours during standard hours
H_{nst}	=	work hours during nonstandard hours
L_r	=	relative's leisure hours
q_s	=	the disutility of receiving a subsidy
s	=	binary indicator of subsidy receipt
L_m	=	mother's leisure hours
J	=	hours of free care received from the relative
M	=	hours of paid care purchased in the market
p	=	price of child care per hour
Y	=	nonwage income
w	=	hourly wage rate
E_s	=	the income eligibility limit for child care subsidy
r	=	the subsidy rate per hour of child care if income is zero
t_s	=	the rate at which child care assistance is reduced as earnings rise
T_s	=	a binary variable indicating whether an eligible mother actually received a subsidy in a state

Assume also that the disutility derived from working during standard hours is less than the disutility derived during nonstandard hours, i.e., $|dU/dH_{st}| < |dU/dH_{nst}|$. The mother chooses C, d_{st}, H_{st}, H_{nst}, w, L_r, s, L_m, J, and M to maximize her utility subject to her constraints. The set of alternative available to a single mother are displayed in Table 1. A single mother chooses the alternative that gives her the highest utility.

Let V_i be the indirect utility associated with alternative i, which can be derived by solving the optimization problem. The value of receiving a subsidy can be written as

$$V_i(s=1) = \max\{V_{i3}(Y, p), V_{i6}(Y, w, p, r, E_s, q_s, t_s), V_{i9}((Y, w, p, r, E_s, q_s, t_s)\}.$$

Similarly, the value of not receiving a subsidy is

$$V_i(s=0) = \max\{V_{i1}(Y), V_{i2}(Y), V_{i4}(Y, w), V_{i5}(Y, w, p), V_{i7}(Y, w), V_{i8}(Y, w, p)\}.$$

A single mother will receive a subsidy if $V_i(s=1) > V_i(s=0)$, $Y + hW \leq E_s$, and $T_s=1$. Thus, a reduced form model of subsidy receipt is a function of non-wage income, prices, all the exogenous variables in the model, and the T_s.

$$s_i = s_i(Y, p, r, w, q_s, t_s, E_s, T_s) \quad (1)$$

Let $Pr(d_{sti}=1|s_i=1, E_i=1)$ be the probability of standard employment conditional on receiving a subsidy and being employed, where E is a binary indicator of employment. Then

$$Pr(d_{sti}=1|s_i=1, E_i=1) = Pr(V_{i6}(Y, w, p, r, E_s, q_s, t_s) > V_{i9}(Y, w, p, r, E_s, q_s, t_s))$$

Similarly, the probability of standard employment conditional on not receiving a subsidy but being employed is

$$Pr(d_{sti}=1|s_i=0, E_i=1) = Pr(\max\{V_{i4}(Y, w), V_{i5}(Y, w, p)\} > \max\{(V_{i7}(Y, w), V_{i8}(Y, w, p)\}).$$

Therefore, the probability of standard employment conditional on subsidy status can be expressed as

$$d_{sti} = d_{sti}(s, E, Y, p, r, w, E_s, q_s, t_s) \quad (2)$$

According to (1) and (2), the only valid identifying instrument for s is the vector T_s. Note that T_s is a binary variable indicating whether a single mother who is eligible for a subsidy actually receives one. It can be assumed that the state's number of eligible children served by child care subsidies and the average amount of CCDF funds spent per child in a state are positively related to T_s. Also, an eligible mother is more likely to receive a child care subsidy in states where mass media are used as a consumer education strategy in child care because she is more likely to be informed about the bureaucratic process, application procedures, and the various opportunities for child care assistance. Based on the theoretical model, these factors should not influence equation (1). One may argue that the parameters of the state child care subsidy system, such as r, t_s, and E_s would serve as identifying instruments by affecting whether a mother receives a subsidy,

but conditional on receiving a subsidy, not affecting the standard employment decision. However, as indicated by the model and expressed by equation (2), these variables affect the standard employment decision. This is because the parameters that determine eligibility for a child care subsidy affect how much a mother can earn and thus the value of being employed and receiving a subsidy (Blau and Tekin 2003).

Econometric Framework

The objective of the paper is to evaluate the impact of child care subsidy receipt on standard employment. Based on the theoretical model, the econometric model can be expressed by the following equations:

$$S_i = X_i\beta + Z_i\delta + T_{si}\mu + \varepsilon_i \quad (3)$$

$$ST_i = \alpha S_i + X_i\gamma + Z_i\zeta + \nu_i \quad \text{if} \quad E_i=1 \quad (4)$$

where S_i is a binary indicator of subsidy receipt for mother i, ST_i is the binary outcome of standard employment, X_i is a vector of family characteristics, Z_i is vectors of policy variables and other characteristics of the location of the residence of the family, ε and ν are disturbances, and β's, δ's, α, γ's, and ζ's are parameters. As the theoretical model implies, the demand for child care subsidies is determined by the price of child care, the mother's wage rate, nonwage income, preferences for consumption relative to leisure, the parameters of the subsidy program, the stigma of participating in a means-tested program, etc. These factors are determined in turn by family characteristics (X), the observed features of the state child care subsidy system (Z and T_s), and unobserved family and state characteristics (ε). Since equation (3) is a reduced form, it is not possible to identify the supply and demand effects of X, Z, and T_s. Therefore, β's, δ's and μ's are the net effects of demand and supply forces on the subsidy receipt.

Identifying the causal impact of child care subsidy receipt on work schedule in equation (4) is complicated by the possibility that ε and ν are correlated. For example, a mother who is strongly motivated to work during standard hours may also be motivated to seek a child care subsidy in order to better accommodate her child care needs, generating a positive correlation between ε_i and ν_i. Alternatively, administrators of the subsidy system may give priority to the least employable mothers (Blau and Tekin 2003), imparting a negative correlation. The theoretical model implies that the vector T_s is a valid identifying instrument since it can be appropriately excluded from the standard work equation. Therefore, the factors that determine T_s are treated as identifying instruments. As mentioned earlier, these characteristics include the average monthly number of eligible children served in the state, the average amount of CCDF funds spent per child in the state, and a binary variable indicating whether the state uses the mass media as a consumer education strategy. These are valid instruments assuming that they influence whether a parent receives a subsidy, but do not influence the standard/nonstandard work decision conditional on receiving a subsidy.

Another complication arises from the fact that ST is observed only for workers (i.e., for those with E=1). Thus, the estimates of equation (3) are subject to bias because of selection into the labor force. To overcome this problem, equations (3) and (4) are estimated jointly with an employment equation. The employment equation can be obtained from the theoretical model similar to the way the standard employment model is derived and can be denoted as

$$E_i = E(S, Y, p, r, w, E_s, q_s, t_s)$$

Substituting equation (3) into S and specifying a linear equation, E_i takes the following fully reduced form

$$E_i = X_i\xi + Z_i\pi + T_{si}\varphi + \eta_i \quad (5)$$

Estimation of (3), (4), and (5) jointly using full information maximum likelihood requires calculating a trivariate integral. I use a random effects estimator with discrete factor approximation, also known as discrete factor method, to estimate the empirical model. The discrete factor method is well suited for this study because it is flexible method in the sense that it eliminates the need to evaluate multivariate normal integrals.[6] Using Monte Carlo methods, Mroz (1999) shows that the random effects estimator with discrete factor approximation is more robust to deviations from normality and quality of implements than two-stage methods.

To implement the discrete factor method, I impose the following structure on the disturbances in equations (3)-(5):

$$\varepsilon_i = \rho_1 u + \lambda_{1i},$$

$$\nu_i = \rho_2 u + \lambda_{2i},$$

$$\eta_i = \rho_3 u + \lambda_{3i},$$

where λ_1, λ_2, λ_3 and u are independently distributed errors and with equation specific factor loading parameters ρ_1, ρ_2, and ρ_3. This structure places the restriction that all heterogeneity or the correlation among the error terms enters the model through the common factor u that is assumed to have a discrete distribution (Heckman and Singer 1984). The discrete factor method assumes that the distribution of heterogeneity can be approximated by a step function and "integrates out" through a weighted sum of

[6] For applications of the discrete factor method, see Blau and Hagy (1998), Mocan and Tekin (2003), Picone et al. (2003).

probabilities. Specifically, $Pr(u = \omega_k) = p_k \geq 0$ for k = 1,….,K and $\sum^K p_k = 1$. The number of points of support K, the location of the support points ω_k and their probabilities p_k are called incidental parameters and are estimated jointly with the other parameters of the system of equations.[7] Then the likelihood function for the system of equations can be written as

$$L = \prod^N \sum^K p_k \Phi(X_i\xi + \pi Z_i + T_{si}\varphi + \rho_1 u_k)^{Ei}(1-\Phi(X_i\xi + \pi Z_i + T_{si}\varphi + \rho_1 u_k))^{1- Ei}$$

$$\Phi(\alpha S_i + X_i\gamma + Z_i\zeta + \rho_2 u_k)^{Ei\ STi}\ (1 - \Phi(\alpha S_i + X_i\gamma + Z_i\zeta + \rho_2 u_k))^{\ Ei(1\ -STi)}\ \Phi(X_i\beta + Z_i\delta +$$

$$T_i\mu + \rho_3 u_k)^{Si}\ (1- \Phi(X_i\beta + Z_i\delta + T_i\mu + \rho_3 u_k))^{\ (1\ -\ Si)}$$

where Φ is the cumulative normal density function.

IV. Data

The data used in this paper are drawn from the second round of the National Survey of America's Families (NSAF). It was conducted by the Urban Institute between February and October 1999.[8] The NSAF sample is representative of the United States civilian, non-institutionalized population under age 65. Residents of 13 states (Alabama, California, Colorado, Florida, Massachusetts, Michigan, Minnesota, Mississippi, New Jersey, New York, Texas, Washington, and Wisconsin) and households with income below 200 percent of the federal poverty line were over-sampled. The over-sampled states contain more than half of the United States population. Interviews were conducted with over 42,000 households.

---

[7] The location and the scale of the distribution of u are not identified. Because each model contains an intercept and the factor loading parameters ρ_1, ρ_2, and ρ_3 are estimated in the parameterization, ω_k is restricted to be between 0 and 1 (Picone et al. 2003). Further parameterization is implemented as follows: $\omega_k = \exp(a_k)/[1 + \exp(a_k)]$, k=2,….,k-1, and $\omega_0 = 0$ and $\omega_K=1$. $p_k = \exp(b_k)/ [1+\Sigma^{K-1}\exp(b_k)]$, k=1,…., K-1, and $p_K = 1/[1+\Sigma^{K-1}\exp(b_k)]$. a's and b's are free parameters to be estimated. The likelihood function is maximized with respect to all the parameters including those describing heterogeneity.

[8] The first round of the NSAF was conducted in 1997 with a different sample.

The NSAF is an ideal data source for the purpose of this study for several reasons. First, it was specifically designed to analyze the consequences of devolution of responsibility for social programs from the federal government to the states. Second, the NSAF is unique in the sense that it provides the only nationally representative household data on child care subsidies. Previous studies have relied exclusively on administrative data to evaluate the impact of child care subsidies. However, there is no appropriate control group for administrative data since they usually contain information only on subsidy recipients. Third, the second round of the NSAF was conducted three years after the welfare reform legislation. In this respect, it presents a more comprehensive picture of the post-welfare reform environment. Finally, the NSAF provides a large sample of single mothers. I limit the sample to single mothers because the standard/nonstandard work behavior of married mothers may be quite different from that of single mothers as fathers are likely to be the primary child care provider when their spouses are at work. Also, single mothers are the primary target for aid under welfare law. For example, they accounted for over 90 percent of TANF cases in 1998 (Committee on Ways and Means, 2000).

The sample used in the analysis includes 4,405 single mothers with at least one child under age 13. The NSAF contains information on child care subsidy receipt for children under age 13, which is the cut-off age for eligibility under CCDF. The mother is asked whether she receives any assistance paying for child care, including assistance from a welfare or social services agency, her employer, and a non-custodial parent. I code a mother as receiving a child care subsidy if she reports that a welfare or social services agency pays for all or part of the cost of child care for any of the children in the

family. A mother is coded as working at a standard job if she reported performing her work during traditional hours of 8 a.m. to 6 p.m. during business days (Monday to Friday). Those who perform their work outside of those traditional hours are coded as working at nonstandard jobs. This group may include mothers who work weekends, evenings, split shifts, or irregular daily or weekly schedules since the NSAF does not distinguish between various types of nonstandard hours.

Definitions and the descriptive statistics used in the analysis are presented in Table 2. Column I shows the means for the whole sample and the column II shows them for workers only. Columns III and IV display the means for standard and nonstandard workers, respectively. Column V displays the means for standard workers who are subsidy recipients and column VI displays the means for standard workers who are non-recipients. As shown in column I, 11.6 percent of the sample receives a child care subsidy. The Administration for Children and Families (2000) predicts that between 12 and 15 percent of all eligible families received a CCDF subsidy in 1998-1999. The sample in this study includes all single mothers regardless of their income and some of these mothers are certainly ineligible for subsidies as their incomes exceed the threshold level.[9] Thus, 11.6 percent subsidy coverage rate is not unreasonable. The employment rate in the sample is 71.1 percent. Among those who are employed, 20.7 percent work nonstandard hours. Among workers, the subsidy receipt is higher for those who work standard hours than those who work nonstandard workers (13.1 percent versus 10.8 percent).

[9] By including all single mothers, I avoid conditioning on income from employment, which constitutes the majority income for the sample. See Blau and Tekin (2003) for a similar approach.

Under the new welfare system, parents are required to work or participate in work related activities (such as education, training, and job search) to be eligible for child care subsidies. Therefore, we would expect subsidy recipients to have a higher employment rate than non-recipients. For the full sample, the employment rate is 77.1 percent among subsidy recipients and 70.3 percent among non-recipients (not shown in the table). Similarly, standard work is more common among subsidy recipients than nonrecipients (82 percent versus 89 percent). These are statistically significant, but relatively small differences, suggesting that many non-working subsidy recipients may be attending school, training, or searching for employment. The NSAF reports the reasons offered by mothers for not working while receiving child care subsidy. A tabulation of these reasons indicate that over 90 percent of nonemployed subsidy recipients have a plausible reason for receiving a subsidy despite not being employed, such as attending school and actively seeking work.

Welfare recipients constitute 15.8 percent of the full sample. This figure matches perfectly with the Current Population Survey, which suggests a 15 percent welfare utilization rate for 1999 (Grogger 2003). A higher percentage of nonstandard workers receive welfare than standard workers (14.2 percent versus 9.3 percent). This is reasonable given that standard workers have higher nonwage income and education than nonstandard workers on average. Furthermore, among standard workers, child care subsidy recipients are much more likely to be on welfare than nonrecipients, 29.4 percent versus 7.6 percent. Given the emphasis of the CCDF that gives priority to welfare recipients, the size of the gap is not surprising.

A full description of the occupational indicators is provided in Table B1. As Table 2 illustrates, there are major differences in occupations between standard and nonstandard workers. Nonstandard workers are concentrated mostly in sectors with high demand for off-hour services. For instance, standard workers are more likely to be employed in managerial, professional specialty, and administrative support occupations than nonstandard workers. On the other hand, they are less likely to work in sales, protective services, service occupations, and occupations such as machine operators, assemblers, inspectors, handlers, helpers or cleaners. The percentage of single mothers with less than a high school degree is approximately 8 percent for standard workers and 15 percent for nonstandard workers. This pattern is entirely reversed for college graduates with 8 percent of nonstandard and 17 percent of standard workers holding a bachelor degree or more. These patterns are consistent with those documented in previous studies using different data sources (e.g., Presser and Cox 1997; Kalleberg et al. 1997). Finally, blacks constitute a much larger portion of subsidy recipients among standard workers compared to whites (41 percent versus 28 percent).

In formulating equations (3), (4), and (5), I condition on a number of characteristics of the mother that reflect both demand and supply factors. These include her age, ethnicity, health status, education, presence of children, family structure, nonwage income, and region of residence. In addition to these variables, the occupation fixed effects are included in the nonstandard employment equation in order to control for any unobserved differences in demand for standard workers across different occupations. The models also include state's median income, unemployment rate for females, state's percentage of female-headed households with children living under poverty, state's

maximum amount of cash assistance for welfare recipients, state's earnings eligibility limit for child care for a single parent family of three, and monthly maximum income allowed for eligibility for a child care subsidy.

V. Results[10]

The results of the employment equation estimated to control for selection into the labor force are displayed in Table A1. Virtually all variables either affect employment in the expected direction or are not related to employment. Since this equation is not central to the paper, the results will not be discussed in the text.

Table 3 presents estimates of the model for child care subsidy receipt. The first column presents the marginal effects and the second column displays the coefficient estimates. The standard errors are in the third column.[11] Blacks are more likely to receive a child care subsidy than both whites and other races. The likelihood of subsidy receipt also increases with the number of children ages 0-5 and 6-13 and the effect is stronger for the younger age group (4.9 percentage points versus 1.7 percentage points). High school graduates and those with some college degree are 3.3 and 5.5 percentage points more likely to receive a child care subsidy than high school dropouts, respectively.

[10] The results presented in this paper are taken from a model estimated with four points of support. A model with five points of support did not provide a significant improvement in the likelihood over a model with four points of support. Although there is no standard theory about how to select the number of points of support in a finite sample, the consensus is to add points of support until the likelihood fails to improve significantly (Blau and Hagy 1998; Heckman and Singer 1984; Mocan and Tekin 2003). Mroz (1999) shows that the likelihood ratio test performs well when determining the number of points of support. The estimates of the heterogeneity parameters are presented in Appendix Table C1.

[11] Note that the majority of the explanatory variables are dichotomous. The marginal effects for these variables are calculated as $1/n\Sigma[\Phi(C_i|X_i=1) - \Phi(C_i|X_i=0)]$, where Φ is the standard cumulative normal distribution and $\Phi(C_i|X_i=1)$ is the predicted probability of standard employment for the ith mother given that the dichotomous variable X is equal to 1 and $\Phi(C_i|X_i=0)$ is her predicted probability given that the X is equal to 0. The marginal effects for the continuous variables are calculated based on infinitesimal changes. Calculating all the marginal effects for the dichotomous variables based on the latter approach did not change the results.

Mothers with higher nonwage income are less likely to receive a child care subsidy than others. A one thousand dollar increase in non-wage income results in a 3 percentage point decrease in the probability of receiving a child care subsidy. The presence of an additional relative in the household decreases the probability of subsidy receipt by 1.7 percentage points. The pattern of these findings is fully consistent with that of Blau and Tekin (2003) who investigate the determinants and consequences of child care subsidies using data from the NSAF.

It is important to note that the coefficients of the variables used as identifying instruments have the expected signs. As displayed in Table 2, a single mother is about 3 percentage points more likely to receive a child care subsidy in states where mass media are used as a consumer education strategy for child care than other states. A one percentage point increase in the number of eligible children served by child care subsidies in a state increases the likelihood of subsidy receipt by a single mother by 0.89 percentage points. An increase in the CCDF funds per child by 1,000 dollars is associated with only a 0.26 percentage point increase in the probability of subsidy receipt, but the coefficient estimate is statistically insignificant. A specification test rejects the hypothesis that the coefficients of these three variables are jointly zero with a p-value of less than 0.01. The coefficients on the parameters of the state's subsidy program (co-payment, reimbursements rate, and income eligibility limit) also have the expected signs, however, none of the coefficients is statistically significant.

Table 4 displays the results of the model for standard-nonstandard employment equation. The variable of the primary interest, the receipt of a child care subsidy, has a positive and significant coefficient. Single mothers who receive a child care subsidy are

6.1 percentage points more likely to work standard hours than nonstandard hours, all else equal. This finding underscores the importance of child care subsidies on facilitating the transition from nonstandard work to standard work for single mother.

Mothers with at least a bachelor's degree are more likely to work at standard jobs than nonstandard jobs. This is consistent with the fact that standard jobs are more human capital demanding than nonstandard jobs. Whites are about 4 percentage points more likely to work at standard jobs than are blacks and other races. The number of children in a household is associated with a decrease in the likelihood of standard work, although the effect is significant only for younger children. This is consistent with Presser and Cox (1997) and Kimmel and Powell (2001) who suggest that given the decision to work, mothers with more children may use nonstandard work as a means of juggling work and family

As displayed in Table 4, occupational status is a strong determinant of a single mother's work schedule. Mothers working in technical, sales and support occupations, as well as protective services, precision production, craft, repairs, farming and fishing; or as machine operators, assemblers, handlers, equipment cleaners and helpers are less likely to work standard schedules, compared to the omitted categories (executive, administrative, managerial occupation), all else equal. This result is not surprising because these are the types of occupations in which the demand for nonstandard hours is usually high (Presser and Cox 1997).

As the descriptive statistics indicate, welfare recipients are more likely to work at nonstandard jobs than nonrecipients. This may have unintended consequences in long run as welfare recipients try to advance in their careers over time. This is because it is

usually the standard jobs that lead to permanent employment. Therefore, it is important to consider whether the impact of subsidy receipt differs between welfare recipients and non-recipients. Normally an indicator for mother's welfare receipt and its interaction with the subsidy receipt variable included into the standard/nonstandard work equation would provide the answer to this question. The differential impact of subsidy receipt on standard work is captured by the interaction term. However, welfare receipt is likely to be endogenous to both subsidy receipt and the standard work decision.[12] Therefore, including welfare receipt as an explanatory variable in the standard work equation might introduce bias to the estimates. In order to avoid this problem, the predicted probability of welfare receipt is constructed from a first stage regression. Then the predicted probability and its interaction with the child care subsidy receipt are included in the standard work equation, which is estimated jointly with the labor force participation and child care subsidy receipt equations using the discrete factor method explained previously. A better alternate would be to estimate an equation for welfare receipt jointly with the system of three equations. However, this alternative is not chosen due to the sensitivity of results to heterogeneity specification and failure in convergence. The state's earnings eligibility limit for TANF for a single parent family of three is used as an identifying instrument in the first stage.

The results of the first stage welfare equation are reported in Table A2 and they behave as one would expect. For example, less educated parents and parents with young children are more likely to use welfare than others. Whites, Hispanics, parents with better health and higher nonwage income are less likely to receive welfare than others. The

[12] However, the problem of endogeneity may be less severe once the model is conditioned on employment. One can argue that once someone decides to work, whether she works standard or nonstandard hours is less likely to be correlated with the unobserved factors that are also correlated with welfare.

identifying instrument, the state's TANF earnings eligibility for a single parent family of three is a positive and significant determinant of welfare receipt. A one hundred dollar increase in the earnings eligibility limit for a single parent applicant increases her probability of welfare receipt by 0.92 percentage point.

The results of the standard work equation with the welfare variable and its interaction with subsidy receipt are presented in Table 5. The coefficient estimates on welfare and its interaction with subsidy receipt reveal something important about the role of child care subsidies on standard work. In particular, the findings indicate that child care subsidies serve as a major incentive for welfare recipients to work at standard jobs, but have a very small impact on nonrecipients. A subsidy-receiving mother is only 1.1 percentage points more likely to work at a standard job than a nonreceiving mother if she is not on welfare. This is a particularly small effect. However, if the mother is on welfare, she is 13.9 (1.1 + 12.8) percentage points more likely to work at a standard job when she is offered a child care subsidy. Similarly, welfare recipients are 15.6 percentage points less likely to work at standard jobs than nonrecipients if they are not offered a subsidy. However, the effect goes down to 3.8 percentage points if they are offered a subsidy. It must be noted that the model in Table 5 restricts the effects of variables other than the subsidy receipt to be the same between welfare recipients and nonrecipients. However, models allowing different effects for age, race, and education variables did not change the implication of the finding in any significant manner. These results suggest that child care subsidies induce welfare receiving mothers to work at standard jobs, but have much less impact for those who do not receive welfare. Most

notably, this finding supports the states' current practice of giving priority to welfare recipients for child care subsidies.

Specification Checks

Occupation Indicators

As discussed earlier, the set of occupation dummies are strong determinants of standard work decision. These dummies are included in the analysis in order to control for the variation in the demand for standard hours and variability in the labor market conditions among occupations. [13] To ensure that the coefficient estimate of the child care subsidy receipt is not influenced by the possibility of occupation indicators being endogenous, the system of equations is estimated with the omission of these indicators. Once these indicators are dropped, the coefficient estimate on the child care subsidy becomes for the model in Table 4 becomes 0.280, which is identical to the present coefficient. Therefore, the effect of child care subsidy receipt is not sensitive to the omission of occupation indicators.

Parameters of the state's child care subsidy system

According to the theoretical model, the parameters of the state's subsidy program (reimbursement rate, co-payment, income eligibility limit, etc) must enter all the equations. However, it can be argued that these parameters are endogenous. To entertain the possibility that the child care subsidy coefficient is contaminated by the endogeneity of the parameters of the state's subsidy program, the system of equations is estimated with the omission of these parameters in all three models. In a fully-reduced form model,

[13] Kimmel and Powell (2001) argue that occupations and industries are choices made more in a lifecycle context, and therefore one would expect more transitions between standard and nonstandard work than across occupations and industries over an immediate time period.

these parameters are determined by observed parent characteristics, observed features of the state economy, and unobserved parent and state characteristics. Dropping these variables had no substantial effect on the estimates. Once these variables are dropped, the coefficient estimate and the marginal effect on the child care subsidy coefficient for the model in Table 4 are 0.232 and 0.046, respectively. This result is not surprising since none of coefficients of these variables was statistically significant when included in the model originally.

Identifying instruments

The choice of identifying instruments for the coefficient of child care subsidy receipt can theoretically be justified by the model presented earlier. The statistical support for these variables is verified first by testing whether the coefficients of these variables have a statistically significant effect in the subsidy equation. As mentioned in the results section, the p-value from this test is less than 0.01, indicating that they are jointly significant. This is not surprising given the fact that two of the three coefficients are highly significant individually in the subsidy equation as displayed in Table 3. The second step is to verify that these three variables are not improperly excluded from the standard employment equation. Thus, the system of equations is estimated with the inclusion of the three variables into the standard employment equation. A likelihood ratio test failed to reject the hypothesis that the effects of the three instruments are jointly zero, providing further support that the three variables do not belong in the standard employment equations.

Childless women

As a final attempt to investigate the identification issue further, I implemented an exercise following Blau and Tekin (2003). Specifically, I created a sample of childless women from the NSAF. Since these women are ineligible for child care subsidies by definition, a predicted subsidy receipt for a woman with no child should not have any impact on the probability of her standard work. I constructed a predicted subsidy for a sample of 4,582 childless women using the coefficients from a subsidy receipt regression estimated by probit. After the predicted probability of subsidy receipt was constructed for each woman, I assigned a 1 to a woman's status of child care subsidy status if her probability is greater than 0.50 and a 0 if the probability is less than 0.50. Then I estimated the system of three equations, subsidy receipt, standard employment, and labor force participation, using FIML. The coefficient estimate on the predicted subsidy receipt turned out to be, although positive, small in magnitude (0.022) and statistically insignificant (with a standard error of 0.262). Therefore, the subsidy receipt has no impact for a group of mothers for whom no such effect is expected.

VI. Conclusion

The evidence linking the quality of the initial job to the probability of maintaining employment and promoting career advancement suggests that finding a job itself may not necessarily result in moving single mothers toward economic self-sufficiency in the long run. It is therefore important to encourage low-income parents to get jobs, which have the potential to move them up the income ladder. This paper considers child care subsidies as a policy strategy for accomplishing this goal. Child care subsidies are an integral part of the new welfare system. Though subsidies are not usually limited to

parents who are on welfare, they are especially vital for the success of welfare reform because of their role in helping parents make the transition from welfare to work and staying off welfare.

This paper provides evidence on the relationship between child care subsidies and standard work using data from the 1999 National Survey of America's Families. The findings suggest that child care subsidies induce mothers to work at standard jobs. Specifically, single mothers with a child care subsidy are 6.1 percentage points more likely to work standard hours than others, all else being equal. When the impact of subsidy receipt is allowed to differ between welfare recipients and non-recipients, results indicate that subsidies generate a relatively substantial incentive (about 14 percentage points) for single mothers to work at standard jobs while they have a much smaller impact (about 1 percentage point) on non-recipients. These results underscore the importance of child care subsidies in helping low income parents, especially welfare recipients, find jobs with the potential for long term economic self-sufficiency. These findings are particularly meaningful given the states' efforts to prioritize TANF recipients for child care assistance. For example, during 1999, 27 states guaranteed child care assistance to families transitioning from TANF to work, and 15 gave priority to those families (State Policy Demonstration Project 1999). However, according to the General Accounting Office, 23 states made changes to their child care assistance programs and decreased the availability of assistance since January 2001, mainly because of the financial crisis they were facing and the exhaustion of TANF surplus from prior years (GAO 2003). Given these facts, results presented in this paper point to the need for a substantial increase in the amount child care funding in the new welfare reform bill in

order to enable TANF participants to achieve real economic security in the long term. Prospects of such expansions are not promising however; instead cuts in child care assistance are more likely in the current debate (Parrott and Mezey 2003).

Table 1: Discrete Alternatives in the Theoretical Model

Alternative	Work	Child Care	Subsidy	Choice Variables
1	None	None	None	Y
2	None	Relative	None	Y
3[14]	None	Market	Yes	Y, p
4	Standard	Relative	None	Y, w
5	Standard	Market	None	Y, w, p
6	Standard	Market	Yes	Y, w, p, E_s, r, q_s, t_s
7	Nonstandard	Relative	None	Y, w
8	Nonstandard	Market	None	Y, w, p
9	Nonstandard	Market	Yes	Y, w, p, E_s, r, q_s, t_s

[14] A single mother can still receive a child care subsidy even if she does not work if she is engaged in work related activities, such as training, going to school, etc. Although, I do not analyze the decisions on work-related activities, this alternative is added to the choice set to account for those mothers.

Table 2: Descriptive Statistics

Variable Name	I. Full Sample	II. Work	III. Standard Work	IV. Nonstandard Work	V. Standard Work and Receive a Subsidy	VI. Standard Work and Do Not Receive a Subsidy
Mother works	0.711	1.000	1.000	1.000	1.000	1.000
	(0.147)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Mother works at a standard job	0.564	0.793	1.000	0.000	1.000	1.000
	(0.496)	(0.405)	(0.000)	(0.000)	(0.000)	(0.000)
Mother works as a nonstandard job	0.147	0.207	0.000	1.000	0.000	0.000
	(0.354)	(0.405)	(0.000)	(0.000)	(0.000)	(0.000)
Mother receives a child care subsidy	0.116	0.126	0.131	0.108*	1.000	0.000
	(0.321)	(0.332)	(0.337)	(0.310)	(0.000)	(0.000)
Mother receives welfare	0.158	0.103	0.093	0.142***	0.305	0.061***
	(0.365)	(0.305)	(0.291)	(0.349)	(0.256)	(0.005)
Mother's age	31.780	32.174	32.530	30.812***	28.898	33.077***
	(7.182)	(7.079)	(6.985)	(7.274)	(6.153)	(6.940)
Mother's race						
Black	0.314	0.307	0.297	0.342**	0.412	0.280***
	(0.464)	(0.461)	(0.457)	(0.475)	(0.493)	(0.449)
White	0.652	0.661	0.672	0.619**	0.557	0.689***
	(0.476)	(0.473)	(0.470)	(0.486)	(0.498)	(0.463)
Other race [a]	0.035	0.033	0.031	0.039	0.031	0.031
	(0.183)	(0.178)	(0.173)	(0.193)	(0.173)	(0.173)
Hispanic Ethnicity	0.172	0.149	0.148	0.153	0.157	0.146
	(0.378)	(0.356)	(0.355)	(0.360)	(0.364)	(0.354)
Mother is in good health	0.835	0.879	0.884	0.858*	0.858	0.888
	(0.371)	(0.327)	(0.320)	(0.349)	(0.349)	(0.316)
Number of relatives living in the household	2.398	2.286	2.231	2.496***	2.397	2.206**
	(1.379)	(1.315)	(1.268)	(1.464)	(1.264)	(1.267)
Mother's education						
Less than high school [a]	0.149	0.093	0.079	0.146***	0.071	0.080
	(0.356)	(0.290)	(0.269)	(0.354)	(0.257)	(0.271)
High school	0.366	0.363	0.359	0.379	0.437	0.348***
	(0.482)	(0.481)	(0.480)	(0.486)	(0.497)	(0.473)
Some college	0.360	0.394	0.393	0.396	0.428	0.388
	(0.480)	(0.489)	(0.489)	(0.489)	(0.496)	(0.487)
Bachelor+	0.126	0.150	0.169	0.079***	0.065	0.184***
	(0.332)	(0.358)	(0.375)	(0.269)	(0.246)	(0.388)
Number of children						
between ages 0-5	0.774	0.692	0.657	0.824***	1.089	0.592***
	(0.787)	(0.736)	(0.723)	(0.772)	(0.774)	(0.692)
between ages 6-13	1.207	1.189	1.193	1.188	0.969	1.221***
	(1.070)	(1.029)	(1.146)	(0.996)	(1.036)	(0.086)
Mother's region of residence						
South	0.290	0.284	0.281	0.294	0.203	0.293***
	(0.454)	(0.451)	(0.450)	(0.456)	(0.403)	(0.455)
West	0.197	0.191	0.195	0.179	0.212	0.192
	(0.398)	(0.393)	(0.396)	(0.383)	(0.410)	(0.394)
Midwest	0.271	0.300	0.298	0.305	0.351	0.291**
	(0.445)	(0.458)	(0.458)	(0.461)	(0.478)	(0.454)
Northeast [a]	0.242	0.225	0.226	0.222	0.234	0.225
	(0.428)	(0.418)	(0.418)	(0.416)	(0.424)	(0.418)
Nonwage income (/1000)[b]	3.399	3.387	3.492	2.983*	1.226	3.833
	(7.158)	(6.808)	(6.992)	(6.040)	(3.994)	(7.278)***

Mother's occupation						
Occupation1[a]	0.076	0.106	0.121	0.051***	0.074	0.128***
	(0.264)	(0.308)	(0.326)	(0.220)	(0.262)	(0.334)
Occupation2	0.087	0.123	0.140	0.069***	0.086	0.145***
	(0.282)	(0.328)	(0.344)	(0.254)	(0.281)	(0.352)
Occupation3	0.032	0.045	0.045	0.043	0.031	0.047
	(0.175)	(0.207)	(0.208)	(0.203)	(0.173)	(0.212)
Occupation4	0.079	0.112	0.100	0.157***	0.126	0.096*
	(0.270)	(0.315)	(0.300)	(0.364)	(0.333)	(0.295)
Occupation5	0.175	0.246	0.271	0.149***	0.357	0.258***
	(0.380)	(0.431)	(0.445)	(0.357)	(0.480)	(0.438)
Occupation6	0.009	0.012	0.010	0.020*	0.006	0.011
	(0.094)	(0.111)	(0.102)	(0.140)	(0.078)	(0.105)
Occupation7	0.146	0.205	0.177	0.314***	0.243	0.167***
	(0.353)	(0.404)	(0.382)	(0.465)	(0.430)	(0.373)
Occupation8	0.023	0.032	0.033	0.028	0.025	0.035
	(0.150)	(0.177)	(0.180)	(0.164)	(0.155)	(0.183)
Occupation9	0.050	0.072	0.062	0.102***	0.022	0.069***
	(0.218)	(0.256)	(0.242)	(0.302)	(0.145)	(0.253)
Occupation10	0.009	0.013	0.014	0.008	0.009	0.015
	(0.096)	(0.114)	(0.120)	(0.088)	(0.096)	(0.123)
Occupation11	0.020	0.027	0.022	0.049***	0.018	0.022
	(0.138)	(0.163)	(0.146)	(0.217)	(0.135)	(0.148)
Occupation12	0.005	0.007	0.007	0.009	0.003	0.007
	(0.072)	(0.085)	(0.082)	(0.096)	(0.055)	(0.086)
State's unemployment rate for females [b]	4.170	4.108	4.105	4.116	3.946	4.129***
	(0.949)	(0.957)	(0.958)	(0.953)	(9.403)	(9.585)
Maximum annual income for subsidy eligibility (/100,000)[c]	0.284	0.283	0.283	0.285	0.290	0.282***
	(0.053)	(0.054)	(0.054)	(0.052)	(0.057)	(0.053)
Monthly copayment for child care for a family of three (/100) [c]	0.514	0.518	0.518	0.515	0.454	0.528***
	(0.384)	(0.378)	(0.379)	(0.374)	(0.371)	(0.379)
Maximum state reimbursement rate for licensed child care (/1000) [c]	0.622	0.624	0.625	0.615	0.665	0.619***
	(0.178)	(0.173)	(0.173)	(0.174)	(0.152)	(0.176)
State's TANF earnings eligibility for a single parent family of three (for applicants) (/1000) [d]	0.641	0.643	0.640	0.656*	0.683	0.633***
	(0.220)	(0.218)	(0.216)	(0.223)	(0.219)	(0.215)
State's percentage of female-headed households with children living under poverty (/100) [e]	0.370	0.367	0.366	0.369	0.357	0.368**
	(0.083)	(0.083)	(0.082)	(0.085)	(0.088)	(0.081)
Percentage of eligible children served in the state (/100) [f]	0.116	0.114	0.114	0.116	0.118	0.113*
	(0.041)	(0.041)	(0.041)	(0.042)	(0.044)	(0.041)
State uses mass media as a consumer education strategy [f]	0.714	0.718	0.718	0.715	0.738	0.715
	(0.452)	(0.450)	(0.450)	(0.452)	(0.440)	(0.451)
Amount of CCDF funds spent per child (/10,000) [f]	0.529	0.535	0.534	0.536	0.570	0.529***
	(0.183)	(0.182)	(0.186)	(0.186)	(0.164)	(0.183)
State's Median Income for a family of three (/100,000) [e]	0.452	0.454	0.454	0.453	0.463	0.452***
	(0.055)	(0.059)	(0.055)	(0.056)	(0.047)	(0.056)
Sample size	4,405	3,132	2,483	649	325	2,158

Note: Standard deviations are in parentheses. *, **, and *** indicate statistically significant difference in means between "standard work" and "nonstandard work" or "standard work and receive a subsidy" and "standard work and do not receive a subsidy" at 10%, 5%, and 1% levels, respectively. Nonwage income includes all income during 1996 except the mother's earnings and income from means-tested programs. Descriptions of occupation indicators are listed in Table B1.

[a] Omitted category. [b] Source: Urban Institute's State Database. [c] Source: Children's defense fund.

[d] Source: State Policy Documentation Project. [e] Source: Bureau of Labor Statistics. [f] Source: Children Care Bureau.

Table 3

The Estimated Coefficients of the Model for the Child Care Subsidy Receipt

Variable	Probit Marginal Effects on Subsidy Receipt	Coefficient	Standard Error
Mother's age	-0.005	-0.038	2.260
Age^2 (/100)	0.025	0.159	0.030
Black	0.077	0.475***	0.451
White	0.010	0.067	0.127
Hispanic Ethnicity	0.003	0.021	0.131
Mother is in good health	-0.008	-0.054	0.152
Number of relatives living in the household	-0.017	-0.084**	0.111
High school	0.033	0.217**	0.154
Some college	0.055	0.358***	0.109
Bachelor+	-0.005	-0.037	0.157
Number of children between ages 0-5	0.049	0.287***	0.150
Number of children between ages 6-13	0.017	0.110**	0.078
South	0.023	0.148	0.030
West	0.045	0.278**	0.105
Midwest	0.002	0.010	0.056
Nonwage income (/1000)	-0.003	-0.021***	0.041
State's unemployment rate for females	-0.087	-1.586***	0.473
State's percentage of female-headed households with children living under poverty (/100)	-0.047	0.423	0.004
Maximum state reimbursement rate for licensed child care (/1000)	0.049	0.287	0.557
Maximum annual income for subsidy eligibility (/100,000)	0.106	0.542	0.223
Monthly copayment for child care for a family of three (/100)	-0.020	-0.149	0.694
State's Median Income for a family of three (/100,000)	0.068	0.379	0.115
Percentage of eligible children served in the state (/100)	0.891	3.595***	1.251
State uses mass media as a consumer education strategy	0.029	0.209**	1.012
Amount of CCDF funds spent per child (/10,000)	0.026	0.162	0.073
Constant	---	-1.248	0.254
Log-likelihood	-5,241.4		
Sample size	4,405		

*, **, and *** indicate that the estimated coefficients are statistically significant at the 10%, 5%, and 1% levels, respectively.

Table 4: The Estimated Coefficients of the Model for the Standard/Nonstandard Employment Model

Variable	Probit Marginal Effects on Standard Work	Coefficient	Standard Error
Mother receives a child care subsidy	0.061	0.283*	0.166
Mother's age	0.027	0.124***	0.035
Age^2 (/1,000)	-0.545	-1.659***	0.512
Black	0.022	0.096	0.158
White	0.042	0.174	0.150
Hispanic Ethnicity	0.020	0.087	0.082
Mother is in good health	0.017	0.072	0.128
Number of relatives living in the household	-0.003	-0.013	0.032
High school	0.045	0.198	0.174
Some college	0.028	0.119	0.195
Bachelor+	0.089	0.441**	0.221
Number of children between ages 0-5	-0.031	-0.124**	0.067
Number of children between ages 6-13	-0.012	-0.052	0.046
South	-0.015	-0.063	0.127
West	0.001	0.005	0.095
Midwest	-0.002	-0.008	0.100
Nonwage income (/1000)	0.000	-0.002	0.005
Occupation2	-0.041	-0.167	0.131
Occupation3	-0.116	-0.426***	0.158
Occupation4	-0.185	-0.658***	0.123
Occupation5	-0.020	-0.084	0.114
Occupation6	-0.236	-0.782***	0.232
Occupation7	-0.205	-0.745***	0.113
Occupation8	-0.088	-0.333**	0.179
Occupation9	-0.198	-0.686***	0.137
Occupation10	0.000	-0.002	0.276
Occupation11	-0.263	-0.860***	0.175
Occupation12	-0.152	-0.536*	0.307
State's unemployment rate for females	-0.019	-0.080	0.445
State's percentage of female-headed households with children living under poverty (/100)	-0.079	-0.299	0.470
Maximum state reimbursement rate for licensed child care (/1000)	0.022	0.096	0.222
Maximum annual income for subsidy eligibility (/100,000)	-0.304	-0.966	0.638
Monthly copayment for child care for a family of three (/100)	0.011	0.048	0.099
State's Median Income for a family of three (/100,000)	-0.423	-1.282	0.932
Constant	---	-0.288	1.012
Log-likelihood	-5,241.4		
Sample size	3,132		

*, **, and *** indicate that the estimated coefficients are statistically significant at the 10%, 5%, and 1% levels, respectively.

Table 5: The Estimated Coefficients of the Model for the Standard/Nonstandard Employment Model with Predicted Welfare Receipt

Variable	Probit Marginal Effects on Standard Work	Coefficient	Standard Error
Mother receives a child care subsidy	0.011	0.039*	0.021
Predicted Welfare	-0.156	-0.641*	0.342
Predicted Welfare*Subsidy	0.118	0.998*	0.554
Mother's age	0.022	0.119***	0.033
Age^2 (/1000)	-0.504	-1.607***	0.483
Black	0.020	0.102	0.159
White	0.029	0.144	0.152
Hispanic Ethnicity	0.011	0.055	0.088
Mother is in good health	0.009	0.044	0.128
Number of relatives living in the household	-0.002	-0.008	0.033
High school	0.037	0.193	0.168
Some college	0.021	0.105	0.186
Bachelor+	0.068	0.401*	0.218
Number of children between ages 0-5	-0.023	-0.109*	0.060
Number of children between ages 6-13	-0.008	-0.040	0.049
South	-0.011	-0.056	0.132
West	0.004	0.022	0.100
Midwest	-0.001	-0.022	0.104
Nonwage income (/1000)	-0.002	-0.006	0.006
Occupation2	-0.034	-0.163	0.136
Occupation3	-0.099	-0.422***	0.163
Occupation4	-0.159	-0.649***	0.129
Occupation5	-0.015	-0.075	0.119
Occupation6	-0.213	-0.790***	0.247
Occupation7	-0.177	-0.743***	0.119
Occupation8	-0.077	-0.336*	0.188
Occupation9	-0.174	-0.688***	0.144
Occupation10	0.002	0.008	0.292
Occupation11	-0.234	-0.856***	0.185
Occupation12	-0.123	-0.502	0.322
State's unemployment rate for females	-0.039	-0.182	0.456
State's percentage of female-headed households with children living under poverty (/100)	-0.059	-0.264	0.491
Maximum state reimbursement rate for licensed child care (/1000)	0.016	0.082	0.233
Maximum annual income for subsidy eligibility (/100,000)	-0.238	-0.858	0.652
Monthly copayment for child care for a family of three (/100)	0.003	0.016	0.106
State's Median Income for a family of three (/100,000)	-0.295	-1.022	0.997
Constant	---	-0.258	1.059
Log-likelihood	-5,239.1		
Sample size	3,132		

*, **, and *** indicate that the estimated coefficients are statistically significant at the 10%, 5%, and 1% levels, respectively.

Appendix A

Table A1: The Estimated Coefficients of the Employment Model

Variable	Probit Marginal Effects on Employment	Coefficient	Standard Error
Mother's age	0.035	0.146***	0.030
Age^2 (/1000)	-0.590	-2.003***	0.451
Black	0.042	0.171	0.157
White	0.037	0.143	0.150
Hispanic Ethnicity	-0.036	-0.138*	0.078
Mother is in good health	0.225	0.758***	0.105
Number of relatives living in the household	0.015	0.060**	0.030
High school	0.200	0.846***	0.127
Some college	0.255	1.073***	0.131
Bachelor+	0.243	1.342***	0.152
Number of children between ages 0-5	-0.114	-0.408***	0.056
Number of children between ages 6-13	-0.049	-0.183***	0.041
South	0.014	0.056	0.154
West	0.025	0.102	0.109
Midwest	0.082	0.337***	0.111
Nonwage income (/1000)	-0.004	-0.014***	0.004
State's unemployment rate for females	-0.202	-0.687	0.473
State's percentage of female-headed households with children living under poverty (/100)	-0.090	-0.328	0.557
Maximum state reimbursement rate for licensed child care (/1000)	-0.052	-0.194	0.223
Maximum annual income for subsidy eligibility (/100,000)	-0.442	-1.430**	0.694
Monthly copayment for child care for a family of three (/100)	-0.005	-0.019	0.115
State's Median Income for a family of three (/100,000)	-0.045	-0.170	1.251
Percentage of eligible children served in the state (/100)	-0.269	-0.916	1.012
State uses mass media as a consumer education strategy	0.001	0.005	0.073
Amount of CCDF funds spent per child (/10,000)	-0.114	0.059	0.254
Constant		-1.920	2.260
Log-likelihood	-5,241.4		
Sample size	4,405		

*, **, and *** indicate that the estimated coefficients are statistically significant at the 10%, 5%, and 1% levels, respectively.

Table A2:The Estimated Coefficients of the First Stage Welfare Receipt Equation

Variable	Probit Marginal Effects on Welfare Receipt	Coefficient	Standard Error
Mother's age	-0.013	-0.077**	0.035
Age^2 (/1000)	0.168	0.965**	0.533
Black	0.009	0.050	0.139
White	-0.041	-0.226*	0.135
Hispanic Ethnicity	-0.043	-0.275***	0.076
Mother is in good health	-0.069	-0.343***	0.066
Number of relatives living in the household	0.009	0.050	0.033
High school	-0.037	-0.221***	0.074
Some college	-0.056	-0.342***	0.076
Bachelor+	-0.091	-0.759***	0.117
Number of children between ages 0-5	0.038	0.219***	0.048
Number of children between ages 6-13	0.030	0.171***	0.044
South	0.019	0.106	0.147
West	0.020	0.112	0.109
Midwest	-0.045	-0.278*	0.110
Nonwage income (/1000)	-0.018	-0.104***	0.015
State's unemployment rate for female workers	-0.213	-1.222	0.469
State's percentage of female-headed households with children living under poverty (/100)	-0.033	-0.187	0.603
Maximum state reimbursement rate for licensed child care (/1000)	-0.038	-0.218	0.231
Maximum annual income for subsidy eligibility (/100,000)	0.057	0.330	0.744
Monthly copayment for child care for a family of three (/100)	-0.003	-0.015	0.124
State's TANF earnings eligibility for a single parent family of three (for applicants) (/1000)	0.092	0.526**	0.264
State's Median Income for a family of three (/100,000)	0.068	0.392	1.204
Percentage of eligible children served in the state (/100)	0.431	2.477***	1.020
State uses mass media as a consumer education strategy	-0.005	-0.027	0.074
Amount of CCDF funds spent per child (/10,000)	0.142	0.813	0.247
Constant		0.197	1.033
Log-likelihood	-1,530.0		
Sample size	4,405		

*, **, and *** indicate that the estimated coefficients are statistically significant at the 10%, 5%, and 1% levels, respectively.

Appendix B

Table B1: Definitions of Occupation Indicators

Occupation 1	: Binary indicator for executive, administrative, and managerial occupations
Occupation 2	: Binary indicator for professional specialty occupations
Occupation 3	: Binary indicator for technicians and related support occupations
Occupation 4	: Binary indicator for sales occupations
Occupation 5	: Binary indicator for administrative support occupations
Occupation 6	: Binary indicator for protective service occupations
Occupation 7	: Binary indicator for service occupations
Occupation 8	: Binary indicator for precision production, craft, and repair occupations
Occupation 9	: Binary indicator machine operators, assemblers, and inspectors
Occupation 10	: Binary indicator for transportation, and material moving equipment occupations
Occupation 11	: Binary indicator for handlers, equipment cleaners, helpers
Occupation 12	: Binary indicator for farming, forestry, and fishing occupations

Appendix C

Table C1: Heterogeneity Parameters

	Coefficient	Standard Error
Factor loading 1	1.238	3.373
Factor loading 2	0.045	1.250
Factor loading 3	1.029***	0.229
	Mass Point	Probability Weight
1st support	0.000	0.005
2nd support	0.401	0.680
3rd support	0.465	0.037
4th support	1.000	0.278

References

Administration for Children and Families (2000). "New Statistics Show Only Small Percentage of Eligible Families Receive Child Care Help," Washington D.C.

Anderson, Patricia M. and Philip B. Levine (2000). "Child Care and Mothers' Employment Decisions," in Finding Jobs: Work and Welfare Reform, Rebecca M. Blank and David Card, eds., New York: Russell Sage Foundation.

Barker, Kathleen (1993). "Changing Assumptions and Contingent Solutions: The Costs and Benefits of Women Working Full and Part Time," *Sex Roles*, January pp:47-71.

Blank, Rebecca (2002). "Evaluating Welfare Reform in the United States," *Journal of Economic Literature* 40(4): 1104:66.

Beers, Thomas M. (2000). "Flexible Schedules and Shift Work," Monthly Labor Review 123(6): 33-40.

Berger, Mark C., and Dan A. Black (1992). "Child Care Subsidies, Quality of Care, and the Labor Supply of Low-Income Single Mothers," *Review of Economics and Statistics* 74 (4), November: 635-642.

Blau, David M., and Alison Hagy (1998). "The Demand for Quality in Child Care," *Journal of Political Economy*, 106(1): 107-146.

Blau, David M. (2003). "Child Care Subsidy Programs," in Means-Tested Transfer Programs in the United States, Robert A. Moffitt ed. NBER.

Blau David M., and Erdal Tekin (2003). "The Determinants and Consequences of Child Care Subsidies for Single Mothers," Working Paper 9665, National Bureau of Economic Research

Bloom, Dan, Mary Farrell, James J. Kemple, and Nandita Verma (1999). "The Family Transition Program: Implementation and Three-Year Impacts of Florida's Initial Time-Limited Welfare Program," New York: Manpower Demonstration Research Corporation, April.

Bos, Johannes M., Aletha C. Huston, Robert C. Granger, Greg J. Duncan, Thomas W. Brock, and Vonnie C. McCloyd (1999). "New Hope for People With Low Incomes: Two-Year Results of a program to Reduce Poverty and Reform Welfare," New York: Manpower Demonstration Research Corporation, August.

Brayfield, April (1995). "Juggling Jobs and Kids: The Impact of Employment Schedules on Fathers' Caring for Children," *Journal of Marriage and the Family* (57): 321-332.

Burstein, Nancy, Jean I. Layzer, Kevin Cahill, et al. (2001). "National Study of Child Care for Low-Income Families: Patterns of Child Care Use Among Low-Income Families," Cambridge, MA: Abt Associates, Inc.

Cancian, Maria, and Daniel R. Meyer (2000). "Work After Welfare: Work Effort, Occupation, and Economic Well-being," *Social Work Research* 24 (2): 69-86.

Casper, Lynne M, and Martin O'Connell (1998). "Work, Income, the Economy, and Married Fathers as Child-Care Providers," *Demography* 35(3): 243-250.

Chaplin, Duncan D., Philip K. Robins, Sandra Hofferth, Douglas A. Wissoker, and Paul Frostin (1999). "The Price Sensitivity of Child Care Demand: A Sensitivity analysis," Working Paper, Washington D.C.: The Urban Institute.

Committee on Ways and Means, U.S. House of Representatives (2000). "2000 Green Book," Washington D.C., May.

Gelbach, Jonah (2002). "Public Schooling for Young Children and Maternal Labor Supply," *American Economic Review* 92 (1): 307-322.

Georges Annie, Robert L. Wasmiller, Jr., and Hsien Hen Lu (2001). "Child Care Subsidy Receipt and State of Residence Comparisons by Age and Parent Work Schedule," National Center for Children in Poverty, December.

Grogger, Jeffrey (2003)."The Effects of Time Limits, the EITC, and Other Policy Changes on Welfare Use, Work, and Income among Female-Headed Families," *The Review of Economics and Statistics*, (85)2: 394-408.

Heckman, James J., and Burton Singer (1984). "A Method for Minimizing the Impact of Distributional Assumptions in Econometric Models for Duration Data," *Econometrica* 52, March: 271-320.

Heymann, Jody (2000). "The Widening Gap: Why America's Working Families are in Jeopardy and What can be Done About It," New York: Basic Books.

Hipple, Steven, and Jay Stewart (1996). "Earnings and Benefits of Contingent and Noncontingent Workers," *Monthly Labor Review*, October pp: 22-30.

Jones-DeWeer, Avis, Janice Peterson, and Xue Song (2003). "Before and After Welfare Reform: The Work and Well-Being of Low-Income Single Parent Families," Institute for Women's Policy Research Report.

Kalleberg, L. Arne, Edith Rasell, Ken Hudson, David Webster, Barbara F. Reskin, Naomi Cassirer, and Eileen Appelbaum (1997). "Nonstandard Work, Substandard Jobs: Flexible Work Arrangements in the U.S.," Economic Policy Institute, Washington D.C.

Kimmel, Jean and Lisa M. Powell (2001) "Nonstandard Work and Child Care Choices: Implications for Welfare Reform," Unpublished Manuscript, July.

Kimmel, Jean and Lisa M. Powell (2002) "Nonstandard Work and Child Care Choices of Married Mothers," Unpublished Manuscript, December.

Kisker, Ellen E., Anu Rangarajan, and Kimberly Boller (1998). "Moving Into Adulthood: Were the Impacts of Mandatory Programs for Welfare-Dependent Teenage Parents Sustained After the Programs Ended?," Princeton NJ: Mathematica Policy Research, February.

Loprest, Pamela (1999). "Families Who Left Welfare: Who are They and How are They Doing?," Washington D.C.: The Urban Institute.

Loprest, Pamela (2002). "Making the Transition from Welfare to Work: Successes but Continuing Concerns," in Alan Weil and Kenneth Finegold (eds.) Welfare Reform: The Next Act Washington D.C.: The Urban Institute Press.

Meyers, Marcia K., Theresa Heintze, and Douglas A. Wolf (2002). "Child Care Subsidies and the Employment of Welfare Recipients," *Demography* 39 (1): 165-180.

Miller, Cynthia, Virginia Knox, Patricia Auspos, Jo Anna Hunter-Means, and Alan Orenstein (1997). "Making Welfare Work and Work Pay: Implementation and 18-Month Impacts of the Minnesota Family Investment Program," New York: Manpower Demonstration Research Corporation, September.

Mocan, Naci H., and Erdal Tekin (2002). "Nonprofit Sector and Part-Time Work: An Analysis of Employer-Employee Matched Data of Child Care Workers," *Review of Economics and Statistics*, 85(1): 38-50.

Mroz, Thomas A. (1999). "Discrete Factor Approximations in Simultaneous Equation Models: Estimating the Impact of a Dummy Endogenous Variable on a Continuous Outcome," *Journal of Econometrics* 92: 233-274.

Nightingale, Demetra Smith (2002). "Work Opportunities for People Leaving Welfare," ," in Alan Weil and Kenneth Finegold (eds.) Welfare Reform: The Next Act Washington D.C.: The Urban Institute Press.

Parrott, S. and J. Mezey (2003). "New Child Care Resources are Needed to Prevent the Loss of Child Care Assistance for Hundreds of Thousands of Children in Working Families," Center for Law and Social Policy and Center on Budget and Policy Priorities, July.

Picone, A. Gabriel, Frank Sloan, Shin-Yi Chou, and Donald H. Taylor, Jr. (2003). "Does Higher Hospital Cost Imply Higher Quality of Care," *Review of Economics and Statistics*, 85(1): 51-62.

Presser, Harriet B. (1986). "Shift Work Among American Women and Child Care," *Journal of Marriage and the Family* (48): 551-563.

Presser, Harriet B. (1988). "Shift Work Among Young Dual-Earner American Parents," *Journal of Marriage and the Family* (50): 133-148.

Presser, Harriet, and Amy G. Cox (1997). "The Work Schedules of Low-Educated American Women and Welfare Reform," *Monthly Labor Review* April: 25-34.

Presser, Harriet B. (2000). "Nonstandard Work Schedules and Marital Instability," *Journal of Marriage and the Family* 62 (February): 93-110.

Quint, Janet C., Johannes M. Bos, and Denise F. Polit (1997). "New Chance: Final Report on a Comprehensive Program for Young Mothers in Poverty and Their Children," New York: Manpower Demonstration Research Corporation, October.

Rangarajan, Anu, Peter Schochet, and Dexter Chu (1998). " Employment Experience of Welfare Recipients Who Find Jobs: Is Targeting Possible?," Princeton, N.J.: Mathematica.

Riccio, James, Daniel Friedlander, and Stephen Freedman (1994). "GAIN: Benefits, Costs, and Three-Year-Impacts of a Welfare-to-Work Program," New York: Manpower Demonstration Research Corporation, September.

Schumacher, Rachel, and Mark Greenberg (1999). "Child Care After Leaving Welfare: Early Evidence from State Studies," Center for Law and Social Policy, http://www.clasp.org/DMS/Documents/997288466.858/child%20care%20after%20leaving%20welfare.pdf

Staines, Graham L. and Joseph H. Pleck (1983). "The Impact of Work Schedules on the Family, " Survey Research Center, Institute for Social Research, Ann Arbor: University of Michigan Press.

State Policy Demonstration Project, http://www.spdp.org

Strawn, Julie, and Karin Martison (2000). "Steady Work and Better Jobs: How to Help Low Income Parents Sustain Employment and Advance in the Workforce," New York: Manpower Research Demonstration Research Corporation.

Tilly, Chris (1996). "Half a Job: Bad and Good Part-Time Jobs in a Changing Labor Market" Philadelphia, Temple University Press, 1996.