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Erdal Tekin
Georgia State University

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Erdal Tekin
Georgia State University
and NBER

Department of Economics
Andrew Young School of Policy Studies
Georgia State University
P.O. Box 3992
Atlanta, GA 30302-3992
tekin@gsu.edu
404-651-3968 (phone)
404-651-4985 (fax)

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Abstract

This paper estimates the effect of child care subsidies on the standard work decision of single mothers and examines whether this effect differs between welfare recipients and nonrecipients. The analysis uses data from the 1999 National Survey of America's Families. Results suggest that child care subsidy receipt is associated with a 6.9 percentage point increase in the probability of single mothers' working at standard jobs. When the effect of subsidy receipt is allowed to differ between welfare recipients and nonrecipients, results indicate that welfare recipients who are offered a child care subsidy are 14 percentage points more likely to work at standard jobs than others. Among nonrecipients, child care subsidy receipt increases standard work probability by only 1.8 percentage point. These findings underscore the important role of child care subsidies in helping low income parents, especially welfare recipients, find jobs with conventional or standard schedules. The results also lend support to the policy of giving priority to welfare recipients for child care subsidies. Results are found to be robust to several specification checks.

JEL Classification: J13, I38
Key words: Child Care Subsidies, Standard work, Welfare, Single Mother

"*A Single parent is constantly scrambling for someone to care for her two preschool daughters while she processes paperwork and inmates at a county jail in Winston-Salem, N.C. Hers is an unpredictable, ever-shifting schedule. Some days, she picks up the phone and calls in her sister, who's often busy with her own teen-ager. Some nights, she persuades a friend with two little ones of her own to let the girls sleep over. Her predicament is shared by millions of Americans who find themselves working long, nonstandard, or erratic hours and having to hunt for child care to match"*

New York Times June 8, 1995

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 exists 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 their jobs 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, majority of states make welfare recipients and families making 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 eight 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, among low income individuals 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.

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

[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.

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 percent) 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 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). Welfare reform might 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 are 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 self-sufficiency 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 address whether there exists a differential effect of subsidy receipt on standard work between welfare recipients and nonrecipients, the equations are re-estimated with an interaction of welfare and subsidy indicators in the standard work model. This investigation is

[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.

particularly important because many states give priority to families leaving welfare for child care assistance (Schumacher and Greenberg 1999).[3]

The empirical analysis uses data from the 1999 National Survey of America's 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 as follows. 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 effect 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, most of the literature on the impact of child care subsidies on employment focuses on the pre-welfare reform period. Because welfare reform changed the systems of welfare and child care assistance 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 projects include child care subsidies along with other

[3] Prior to 1996, welfare recipients had the priority in receiving child care subsidies. This is no longer a requirement under federal law, although it is still often the case in practice.

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 was 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 using the cost child care. These studies typically exploit the variation in child care costs across individuals and the geographic variation in the cost of child care.[5] They implicitly rely on the strong assumption that there are no costs to taking up a subsidy in the form of either the time costs required to deal with the bureaucratic system or the stigma of participating in a means-tested program. If this assumption is not true however, then the price effect would not be a reliable guide for the subsidy effect and the endogeneity of the decision to take up a subsidy must be addressed (Blau 2003).

Research on the impact of *actual* child care subsidies has been limited, primarily due to a lack of data. Berger and Black (1992) and Gelbach (2002) examine the effect of child care subsidies by comparing the employment of two groups of mothers who are separated from each other by 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 child

[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 an excellent summary of these studies.

care subsidy receipt 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 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 extremely limited and mostly descriptive in nature. An important difference between the present analysis and previous research 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 like modes of child care or the decision to a receive 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; and Kimmel and Powell 2001). With the exception of Kimmel and Powell (2001), none of them addressed the endogeneity of standard/nonstandard work status. Kimmel and Powell (2001) examine the impact of standard work on 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 effect of child care subsidies on standard

work. 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 is assumed to allocate her time between child care and leisure with employment ruled out for simplicity. Although the choice of paid versus unpaid care and the employment decision of the relative are not part of the empirical model, they are considered 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. 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 is actually offered a subsidy

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. She 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. Given Table 1, 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_i 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

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

According to (1) and (2), the only valid identifying instrument for s is T_s. Note that T_s is a binary variable indicating whether a single mother who is eligible for a subsidy is actually offered one. It is assumed that the average amount of CCDF funds spent per child in a state and state's percentage of eligible children served by child care subsidies are positively related to T_s. These variables would both determine the state's degree of generosity in providing child care assistance and capture the factors that determine how subsidies are rationed by states. 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. [6]

[6] Only 12-15 percent of eligible families are served by a CCDF subsidy in 1998-1999 (The Administration for Children and Families 2000). Therefore, it is hard to imagine that states can avoid rationing. Evidence suggests that one third of states report that there is a waiting list for a child care subsidy. Two-fifths of all states report that most eligible families are not aware of their eligibility. Only four states report that they

Based on the theoretical model, these factors should not influence equation (1) directly. 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 effect of child care subsidy receipt on standard employment. Based on the theoretical model, the econometric model can be expressed by the following equations:

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

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

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_i and ν_i are disturbances, and β's, δ's, α, γ's, and ζ's are the 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

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could serve all eligible families. (Schulman, Blank, and Ewen 2001). Also, the absence of a waiting list may simply be due to the fact that states simply turn away clients for whom funds are not available, without putting them on a waiting list (Blau and Tekin 2003).

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_i and ν_i 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 amount of CCDF funds spent per child in the state, the percentage of eligible children served in the state, and a binary variable indicating whether the state uses mass media as a consumer education strategy.

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) would be biased due to selection into labor force. In order to address this problem, equations (3) and (4) are estimated jointly with a binary 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

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

Replacing s by equation (3) and specifying a linear equation, E_i takes the following fully reduced form[7]

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

Estimation of equations (3), (4), and (5) jointly using full information maximum likelihood requires calculating a trivariate integral. This is accomplished by employing a random effects estimator with discrete factor approximation, also known as discrete factor method. The discrete factor method is well suited for this study because it is a flexible method in the sense that it eliminates the need to evaluate multivariate normal integrals (See Blau and Hagy (1998), Mocan and Tekin (2003), Picone et al. (2003) for examples). 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 instruments than two-stage methods.

To implement the discrete factor method, the following structure is imposed 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 across the error terms enters the model through the

[7] Note that subsidy receipt is not in the employment equation. This is because the determinants of the subsidy receipt are substituted into the employment, which results in a fully reduced form equation. This is preferred because it is the subsidy receipt-standard work relationship that is the focus of this paper. See Meyers, Heintze, and Wolf (2002) and Blau and Tekin (2003) for the effect of subsidy receipt on work-nowork decision.

common factor u that is assumed to follow a discrete distribution (Heckman and Singer 1984). 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 point ω_k and their probabilities p_k are called incidental parameters and are estimated jointly with the other parameters of the system of equations.[8] Then the likelihood function for the system of equations can be written as

$$L = \prod_i^N \sum_k^K p_k Pr(E_i = 1| u_k)^{Ei} (1 - Pr(E_i = 1| u_k))^{1- Ei} Pr(ST_i=1| u_k)^{Ei\, STi} (1 - Pr(ST_i=1| u_k))^{Ei(1 -STi)} Pr(S_i = 1| u_k)^{Si} (1 - Pr(S_i=1| u_k)^{(1 - Si)}.$$

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.[9] The NSAF sample is representative of the United States civilian, non-institutionalized population under age 65. Residents of 13 states 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.[10]

[8] 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 specified 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 representing heterogeneity.

[9] The first round of the NSAF was conducted in 1997 with a different sample. There is a third wave conducted with another sample in 2001. The third wave has not been made public yet.

[10] These thirteen states are Alabama, California, Colorado, Florida, Massachusetts, Michigan, Minnesota, Mississippi, New Jersey, New York, Texas, Washington, and Wisconsin.

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 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 represents 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 assistance under welfare law. As a matter of fact, they accounted for over 90 percent of TANF cases in 1998 (Committee on Ways and Means 2000).

The sample used in the analysis contains 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 a social services agency, her employer, and a non-custodial parent. A mother is coded as receiving a child care subsidy if she reports that a welfare or a 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 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.[11] 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).

[11] 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.

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 usually have higher nonwage income and education than nonstandard workers, which would make it harder for them to be eligible for welfare. 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 on giving priority to welfare recipients, the size of this difference is not surprising.

As Table 2 illustrates, there are major differences in occupations between standard and nonstandard workers. A full description of the occupational indicators is provided in Table B1. 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 figures 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 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, maximum reimbursement rate for licensed child care, maximum annual income for subsidy eligibility, and monthly copayment for child care for a family of three.

V. Results

The results of the employment equation estimated to control for selection into the labor force are displayed in Table A1. They are mostly consistent with those usually found in the relevant literature. Since this equation is not the central focus of the paper, the results will not be discussed in the text.

Table 3 presents the estimates of the model for child care subsidy receipt. [12] The first column presents the coefficient estimates and the second column displays the

[12] 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; Picone et al. 2003; 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.

standard errors. Linear probability models are estimated for ease of interpretation. Standard errors are corrected for heteroscedasticity using weighted least squares. 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 between ages 0-5 and 6-13 and the effect is stronger for the younger age group (5 percentage points versus 2.4 percentage points). High school graduates and those with some college degree are 3.6 and 6 percentage points more likely to receive a child care subsidy than high school dropouts, respectively. 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 about 2 percentage points.

It is important to note that the coefficients of the variables used as identifying instruments have the expected signs. As displayed in Table 3, living in a state where mass media are used as a consumer education strategy for child care subsidies is associated with a 4 percentage point increase in child care subsidy receipt. 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 0.78 percentage points. An increase in the CCDF funds per child by 1,000 dollars is associated with only a 0.49 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 0.001. This indicates that it is unlikely that the model suffers from the problems

of weak instruments. [13] 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 6.9 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 among single mothers.

Mothers with at least a bachelor's degree are more likely to work at standard jobs than others. 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 other races, but the coefficient is not significant. The number of children in the 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 significant 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

[13] Bound et al. (1995) note that the use of instruments with little predictive power that explains the variation in the endogenous explanatory variables can lead to inconsistent estimates.

helpers are less likely to work standard schedules, compared to the omitted category (executive, administrative, managerial occupations), 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 the long run as welfare recipients try to advance in their careers over time, especially if 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 in the standard-nonstandard work equation would provide the answer to this question. However, welfare receipt is likely to be endogenous to both subsidy receipt and the standard work decision.[14] Therefore, including welfare receipt as an explanatory variable in the standard work equation might introduce bias to the estimates. In order to address this problem, the predicted probability of welfare receipt is constructed from a first stage regression. Then this 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 random effects estimator explained previously.[15] The state's earnings eligibility limit for TANF for a single parent family of

[14] 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.

[15] An alternative to this approach 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.

three and the maximum monthly TANF benefit level for a family of three are used as identifying instruments 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 identifying instruments, the state's TANF earnings eligibility and the maximum benefit level are statistically significant determinants 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 1.18 percentage point. A one hundred dollar increase in the maximum TANF benefit level is associated with about 0.7 percentage point increase in welfare receipt. One would argue that states with generous welfare policies would also adopt generous employment policies. In this case, the instruments might be picking up the effects of these unobserved policy variables, thus should not be excluded from the second stage equation. However, when included in the second stage standard-nonstandard employment equation, none of the two instruments had a significant coefficient.

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 indicate that child care subsidies serve as a major incentive for welfare recipients to work at standard jobs, but have a much smaller impact on nonrecipients. A subsidy-receiving mother is only 1.8 percentage points more likely to work at a standard job than a nonrecipient mother if she is not on welfare. This

is a particularly small effect. However, if the mother is on welfare, she is 14.0 (1.8 + 12.2) percentage points more likely to work at a standard job when she is offered a child care subsidy. Similarly, welfare recipients are 15 percentage points less likely to work at standard jobs than nonrecipients if they are not offered a subsidy. However, the effect goes down to 2.7 percentage points (-0.149 + 0.122) if they are offered a subsidy. These results suggest that child care subsidies induce welfare receiving mothers to work at standard jobs, but have much less of an effect for those who do not receive welfare. Most notably, this finding supports the states' current policy 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. To ensure that the coefficient estimate of the child care subsidy receipt is not influenced by the possibility of the endogeneity of occupation indicators, the system of equations is estimated without these occupation indicators. Once these indicators are dropped, the effect of child care subsidy receipt is still statistically significant and is equal to 0.059, which is very close to the present estimate. 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 address 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 without these parameters in all three models. In a fully-reduced form model, 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 effect of child care subsidy coefficient on standard/nonstandard work becomes 0.073. 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 is theoretically 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 earlier, the p-value from this test is less than 0.001, 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. Furthermore, a specification test indicated that the three instruments are appropriately excluded from the standard employment equation and are not directly related to employment decision. In a model

with these three instruments included in the standard employment equation, none of the coefficients of the instruments were statistically significant at conventional levels.

Childless women

As a final attempt to investigate the identification issue further, I created a sample of childless women from the NSAF following Blau and Tekin (2003). 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. 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 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 equations for 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 (0.019) and statistically insignificant with a standard error of 0.162. 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 probabilities 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 seek jobs with a potential to move them up the income ladder. This paper examines the

effectiveness of 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 6.9 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 for single mothers to work at standard jobs while they have a much smaller impact on non-recipients. These results underscore the importance of child care subsidies in helping low income parents, especially welfare recipients, find jobs with a 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 of child care funding in the new welfare reform bill in order to enable TANF participants to achieve real economic security in the long term.

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[16]	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

[16] 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 maximum TANF benefits for a family of three (/1000) [d]	0.446	0.451	0.451	0.449	0.498	0.444
	(0.188)	(0.188)	(0.187)	(0.193)	(0.173)	(0.188)
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
Determinants of Receipt of a Child Care Subsidy

Variable	Coefficient	Robust Standard Error
Mother's age	-0.015***	0.006
Age^2 (/100)	0.018**	0.009
Black	0.085***	0.027
White	0.012	0.026
Hispanic Ethnicity	0.004	0.014
Mother is in good health	-0.007	0.124
Number of relatives living in the household	-0.018***	0.006
High school	0.036***	0.014
Some college	0.060***	0.015
Bachelor+	0.002	0.017
Number of children between ages 0-5	0.050***	0.011
Number of children between ages 6-13	0.024***	0.008
South	0.027	0.022
West	0.051**	0.023
Midwest	0.002	0.016
Nonwage income (/1000)	-0.003***	0.001
State's unemployment rate for females	-0.212***	0.076
State's percentage of female-headed households with children living under poverty (/100)	-0.087	0.072
Maximum state reimbursement rate for licensed child care (/1000)	0.042	0.034
Maximum annual income for subsidy eligibility (/100,000)	0.106	0.707
Monthly copayment for child care for a family of three (/100)	0.111	0.106
State's Median Income for a family of three (/100,000)	0.056	0.208
Percentage of eligible children served in the state (/100)	0.782***	0.167
State uses mass media as a consumer education strategy	0.035***	0.013
Amount of CCDF funds spent per child (/10,000)	0.049	0.038
Constant	0.292*	0.163
Log-likelihood	-4,567.2	
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	Coefficient	Robust Standard Error
Mother receives a child care subsidy	0.069**	0.035
Mother's age	0.031***	0.009
Age^2 (/1,000)	-0.475***	0.132
Black	0.023	0.039
White	0.042	0.043
Hispanic Ethnicity	0.023	0.019
Mother is in good health	0.015	0.021
Number of relatives living in the household	-0.004	0.008
High school	0.051*	0.028
Some college	0.032	0.030
Bachelor+	0.095***	0.036
Number of children between ages 0-5	-0.032**	0.015
Number of children between ages 6-13	-0.014	0.011
South	-0.016	0.033
West	0.001	0.025
Midwest	-0.003	0.021
Nonwage income (/1000)	-0.001	0.001
Occupation2	-0.035	0.026
Occupation3	-0.102**	0.048
Occupation4	-0.175***	0.032
Occupation5	-0.014	0.021
Occupation6	-0.229***	0.089
Occupation7	-0.201***	0.029
Occupation8	-0.073*	0.040
Occupation9	-0.188***	0.044
Occupation10	0.008	0.053
Occupation11	0.246***	0.061
Occupation12	-0.142*	0.075
State's unemployment rate for females	-0.008	0.131
State's percentage of female-headed households with children living under poverty (/100)	-0.076	0.118
Maximum state reimbursement rate for licensed child care (/1000)	0.027	0.053
Maximum annual income for subsidy eligibility (/100,000)	-0.281	0.183
Monthly copayment for child care for a family of three (/100)	0.011	0.024
State's Median Income for a family of three (/100,000)	-0.367	0.268
Constant	0.427**	0.229
Log-likelihood	-4,567.2	
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	Coefficient	Robust Standard Error
Mother receives a child care subsidy	0.018*	0.101
Predicted Welfare	-0.149**	0.074
Predicted Welfare*Subsidy	0.122*	0.067
Mother's age	0.029***	0.009
Age^2 (/1000)	-0.488***	0.136
Black	0.020	0.043
White	0.031	0.040
Hispanic Ethnicity	0.017	0.016
Mother is in good health	0.011	0.021
Number of relatives living in the household	-0.002	0.009
High school	0.044	0.030
Some college	0.024	0.031
Bachelor+	0.085***	0.027
Number of children between ages 0-5	-0.029**	0.138
Number of children between ages 6-13	-0.011	0.014
South	-0.016	0.028
West	0.001	0.025
Midwest	-0.003	0.023
Nonwage income (/1000)	-0.001	0.001
Occupation2	-0.032	0.022
Occupation3	-0.096***	0.045
Occupation4	-0.156***	0.029
Occupation5	-0.012	0.020
Occupation6	-0.209***	0.078
Occupation7	-0.183***	0.027
Occupation8	-0.072*	0.038
Occupation9	-0.176***	0.036
Occupation10	0.006	0.050
Occupation11	-0.238***	0.056
Occupation12	-0.120	0.092
State's unemployment rate for females	-0.007	0.111
State's percentage of female-headed households with children living under poverty (/100)	-0.083	0.129
Maximum state reimbursement rate for licensed child care (/1000)	0.024	0.054
Maximum annual income for subsidy eligibility (/100,000)	-0.264	0.168
Monthly copayment for child care for a family of three (/100)	0.009	0.025
State's Median Income for a family of three (/100,000)	-0.315	0.254
Constant	-0.465***	0.236
Log-likelihood	-4,558.5	
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	Coefficient	Robust Standard Error
Mother's age	0.036***	0.009
Age^2 (/1000)	-0.514***	0.128
Black	0.041	0.035
White	0.033	0.031
Hispanic Ethnicity	-0.028*	0.016
Mother is in good health	0.185***	0.018
Number of relatives living in the household	0.017**	0.008
High school	0.214***	0.023
Some college	0.285***	0.027
Bachelor+	0.312***	0.025
Number of children between ages 0-5	-0.101***	0.015
Number of children between ages 6-13	-0.045***	0.012
South	0.019	0.032
West	0.021	0.023
Midwest	0.074***	0.025
Nonwage income (/1000)	-0.004***	0.001
State's unemployment rate for females	-0.192*	0.112
State's percentage of female-headed households with children living under poverty (/100)	-0.131	0.122
Maximum state reimbursement rate for licensed child care (/1000)	-0.035	0.051
Maximum annual income for subsidy eligibility (/100,000)	-0.383**	0.166
Monthly copayment for child care for a family of three (/100)	-0.005	0.029
State's Median Income for a family of three (/100,000)	-0.039	0.281
Percentage of eligible children served in the state (/100)	-0.174	0.216
State uses mass media as a consumer education strategy	-0.002	0.018
Amount of CCDF funds spent per child (/10,000)	0.026	0.054
Constant	0.087	0.249
Log-likelihood	-4,567.2	
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	Coefficient	Robust Standard Error
Mother's age	-0.025***	0.007
Age^2 (/1000)	0.286***	0.093
Black	0.009	0.036
White	-0.048*	0.028
Hispanic Ethnicity	-0.051***	0.015
Mother is in good health	-0.070***	0.018
Number of relatives living in the household	0.003	0.007
High school	-0.058***	0.019
Some college	-0.079***	0.021
Bachelor+	-0.099***	0.020
Number of children between ages 0-5	0.057***	0.012
Number of children between ages 6-13	0.039***	0.010
South	0.015	0.034
West	0.028	0.025
Midwest	-0.062***	0.023
Nonwage income (/1000)	-0.014***	0.001
State's unemployment rate for female workers	-0.210**	0.099
State's percentage of female-headed households with children living under poverty (/100)	-0.036	0.125
Maximum state reimbursement rate for licensed child care (/1000)	-0.065	0.071
Maximum annual income for subsidy eligibility (/100,000)	0.055	0.157
Monthly copayment for child care for a family of three (/100)	0.006	0.026
State's TANF earnings eligibility for a single parent family of three (for applicants) (/1000)	0.118**	0.053
State's maximum TANF benefits for a family of three (/1000)	0.065*	0.036
State's Median Income for a family of three (/100,000)	0.003	0.255
Percentage of eligible children served in the state (/100)	0.551**	0.246
State uses mass media as a consumer education strategy	-0.005	0.021
Amount of CCDF funds spent per child (/10,000)	0.206***	0.055
Constant	0.527**	0.216
Log-likelihood	-1,525.1	
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	0.877	1.112
Factor loading 2	0.062	0.088
Factor loading 3	0.714***	0.031
	Mass Point	Probability Weight
1st support	0.000	0.009
2nd support	0.356	0.589
3rd support	0.441	0.108
4th support	1.000	0.294

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