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THE DETERMINANTS AND CONSEQUENCES OF CHILD CARE SUBSIDIES FOR SINGLE MOTHERS

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ABSTRACT

This paper provides an analysis of child care subsidies under welfare reform. Previous studies of child care subsidies use data from the pre-welfare-reform period, and their results may not apply to the very different post-reform environment. We use data from the 1999 National Survey of America's Families to analyze the determinants of receipt of a child care subsidy and the effects of subsidy receipt on employment, school attendance, job search, and welfare participation. We analyze the impact on subsidy receipt of household characteristics such as family size and structure, and past participation in welfare. The most important determinant of receipt of a child care subsidy is past receipt, but we cannot determine from our analysis whether this is a causal effect or a result of unobserved heterogeneity. Ordinary least squares estimates that treat subsidy receipt as exogenous show an effect of subsidy receipt of about 13 percentage points on employment. Two stage least squares estimates that treat subsidy receipt as endogenous and use county dummies as identifying instruments show an effect of 32 percentage points. We present some evidence that is consistent with the assumption that county dummies are valid identifying instruments, and some evidence that is inconsistent with the assumption.

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1. Introduction

The 1996 Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) consolidated four different child care subsidy programs for low-income families into a single block grant, the Child Care and Development Fund (CCDF). The Act also substantially increased funding for child care subsidies, and gave states considerable flexibility in setting subsidy program rules. Furthermore, states were given permission to transfer up to 30 percent of their Temporary Assistance for Needy Families (TANF) block grant funds into the CCDF, and to spend additional TANF funds directly on child care subsidies. These changes indicate that policy makers view child care subsidies as an important part of welfare reform. In fiscal year 1999 states spent all of their CCDF allocation of around $5 billion, and spent another $4 billion dollars on child care from the TANF block grant. However, we know very little about whether child care subsidies have in fact contributed significantly to the main goal of welfare reform, which is to increase employment and economic self-sufficiency among low-income families (Blank, 2002).

This paper provides an analysis of child care subsidies under welfare reform. The analysis uses household survey data from the post-reform period to examine the determinants of subsidy receipt and the effects of subsidy receipt on employment, welfare participation, and related outcomes. The data are from a sample of single mothers in the National Survey of America's Families (NSAF), conducted by the Urban Institute in 1999. This is one of the only available national household surveys from the post-welfare-reform period that includes information about child care subsidies. Other post-welfare-reform studies of child care subsidies have relied exclusively on administrative data. An advantage of household survey data over administrative data is that information is available on both subsidy recipients and non-recipients.

Determinants of receipt can therefore be analyzed, and the employment and related outcomes of recipients and non-recipients can be compared. The survey also includes more detailed information on outcomes of interest than is usually available in administrative data. The NSAF sample includes a large number of current and former welfare recipients and other single-mother families, providing a basis for reliable inference for the target population of welfare reform. State of residence is identified in the NSAF, so we are able merge information on the characteristics and rules of state welfare and child care subsidy programs with the household data. For 13 of the largest states, county of residence is identified as well for larger counties. This provides a source of within-state variation that can help identify the impact of child care subsidies.

We use the data to address two issues. First, how do household characteristics affect the likelihood of receiving a subsidy? If subsidies are rationed, then it is important to determine the factors associated with subsidy receipt. Key household characteristics include family size and structure, past participation in welfare, and past receipt of a child care subsidy. Second, how does subsidy receipt affect employment, school enrollment, job search, and welfare participation? In this part of the analysis we attempt to account for the likely possibility that unobserved determinants of whether a single mother receives a subsidy are correlated with unobserved determinants of the outcomes of interest. The results indicate that past receipt of a child care subsidy has a large positive effect on the likelihood of receiving a child care subsidy at the time of the survey. Conditional on these two lagged dependent variables, and on household characteristics, observable county characteristics, and state fixed effects, receiving a child care subsidy at the time of the survey is associated with a 13 percentage point higher rate of employment, a three percentage point higher probability of enrollment in school, no difference in

unemployment, and a one percentage point increase in welfare receipt. Two-stage least squares estimates using county dummies as instruments for subsidy receipt show larger positive effects on both employment and unemployment. The effects on employment are especially large, and they suggest a significant bias in estimating subsidy effects from simple comparisons of subsidy recipients and non-recipients. We provide some statistical evidence suggesting that county dummies are valid identifying instruments, but some other institutional data casts doubt on the validity of the identifying assumption. The results of the analysis will be useful to policy makers and researchers in understanding the potential contribution of child care subsidies to achieving welfare reform goals.

Section 2 of the paper describes the current structure of child care subsidy programs in the U.S., and section 3 reviews previous evidence on the effects of child care subsidies. Section 4 presents descriptive information from the NSAF, and section 5 describes the models we estimate. The results of the empirical analysis of subsidy receipt and effects are presented in section 6, and section 7 concludes.

2. Child Care Subsidy Programs

The programs discussed here provide subsidies for work-related child care expenses of children in low-income families. Before welfare reform, there were four major child care subsidy program with different goals, rules, and target populations (Blau, 2003). PRWORA consolidated the four programs into a single child care block grant program called the Child Care and Development Fund (CCDF). The main goal of the consolidated program is to facilitate the transition from welfare to work and help maintain employment of low-income parents. States can use CCDF funds to assist families with income up to 85 percent of state median income, but

are free to use a lower income-eligibility criterion. Parents must be employed, in training, or in school, although some exceptions are permitted. Priority for CCDF funds is supposed to be given to families with very low incomes and children with special needs. Specifically, states must use at least 70 percent of their mandatory and matching funds[1] to serve families on welfare, families in work activities who are moving off welfare, and families at risk of going on welfare. The CCDF also requires that a portion of the funds be used to assist working poor families who are not currently, recently, or likely future welfare recipients. As part of the general increase in flexibility provided by PRWORA, states are permitted to transfer up to 30 percent of their TANF block grant funds to the CCDF to be used for child care, and can also use TANF funds directly for child care services without transferring the funds to CCDF.

States have substantial flexibility in designing their CCDF programs, including the income eligibility limit, co-payments by families, and reimbursement rates to providers. Only nine states currently set income eligibility at the maximum allowed by law, 85 percent of state median income. Seven states set the income eligibility limit at less than 50 percent of median income. States are permitted to waive fees (co-payments) for families with income below the poverty line, and there is substantial variation across states in use of this provision. Fees are determined in many different ways, including flat rates, percent of cost, percent of income, and combinations of these. States are required to have sliding scale fee structures, with fees that rise

[1]Federal CCDF funds are provided to the states in three "streams:" discretionary, mandatory, and matching. Discretionary and mandatory funds are distributed according to rules similar to those of the old programs, primarily based on the number of children and state income. These two streams do not require state matching funds. To receive funds from the matching stream, "a state must maintain its expenditure of state funds for child care programs at specified previous levels ('maintenance-of-effort' spending) and spend additional state funds above those levels." (U.S. General Accounting Office, 1998, p. 5).

with family income. Federal guidelines for implementation of the CCDF law require that the subsidy rate be set at the 75th percentile of the price distribution from a recent local market rate survey. Recent evidence suggests that in practice many states use out-of-date market rate surveys or set the subsidy rate lower than the 75th percentile of the price distribution (Adams, Schulman, and Ebb, 1998, p. 23).

The CCDF is a capped entitlement, with no obligation to serve all eligible families. It is estimated that the CCDF served only 12-15 percent of eligible children in recent years (Administration for Children and Families, 1999, 2000). There is no systematic information available on how CCDF funds are allocated among eligible families. Schumacher and Greenberg (1999) summarize evidence from a number of studies of child care subsidy receipt by families who have left welfare in recent years. They report that in most states fewer than 30 percent of welfare leavers who are employed receive a child care subsidy. Lack of awareness of subsidies was reported to be high among these families. The studies also reported that the majority of these families were using informal child care by relatives. Jacobson (2000) also reports low subsidy use by welfare leavers in California.

3. Previous Evidence

Existing evidence on the determinants of receiving a child care subsidy and on the effects of child care subsidies is limited almost entirely to the pre-1996 period, before the major federal welfare reform. Concerning the determinants of subsidy receipt, Meyers and Heintze (1999) examined the use of child care subsidies in a sample of welfare recipients in four California counties in 1995. In their sample, 16 percent of employed mothers received a child care subsidy, 30 percent of mothers enrolled in education or training programs received a subsidy, and 34

percent of mothers in neither activity received a subsidy (including Head Start). The public subsidy system for child care in California was quite complex prior to PRWORA, with at least seven different subsidy programs. When mothers were asked why they did not receive subsidies from the programs for which they appeared to be eligible, the majority response for all three employment-related subsidy programs, one out of two education-and-training-related subsidies, and one out of two child-education subsidies was that they were not aware of the program. The majority response for the other two subsidy programs was "aware of the program but did not apply." The acceptance rate for mothers who applied averaged 72% across all programs.

Fuller et al. (1999) estimated a model of the child care subsidy take-up decision of mothers enrolled in TANF using data collected in San Francisco, San Jose, and Tampa in 1998. Of the women in their sample who used any non-maternal child care, 37-44 percent received a subsidy, depending on the site. Presumably, all of the women in this sample were categorically eligible for a child care subsidy, but there is no way to determine whether the mothers who did not receive a subsidy were rationed out or did not take up the subsidy offer. A regression analysis showed that a woman's knowledge of child care subsidy rules and participation in a TANF-sponsored job search class were positively associated with receiving a subsidy.

Concerning the effects of receiving a child care subsidy, several demonstration programs designed to help low-income families achieve economic independence included child care subsidies along with other benefits and services. These programs were conducted as part of welfare waiver evaluations prior to PRWORA, and used randomized assignment methods. However, in each case the child care subsidy was only one of several services provided as part of the program, so it is not possible to determine how much of the program impacts were due to the

child care subsidy.[2]

Three studies have estimated the impact of actual child care subsidies on employment. Berger and Black (1992) evaluated the employment impact of two Kentucky child care subsidy programs funded by Title XX in 1989. Their estimates indicate that the average weekly subsidy of $46 induced an increase in maternal employment of 8.4 to 25.3 percentage points, depending on how selection into receiving a subsidy is modeled. Berger and Black used samples from the subsidy waiting list and the Current Population Survey, as well as comparisons of behavior before and after entering the waiting list, to control for selection effects. Meyers, Heintze, and Wolf (2002) used data from a sample of California AFDC recipients in four counties during 1992-1995 to analyze the impact of subsidy receipt on employment. The predicted probability of receiving a subsidy, estimated in a first stage model, had a positive coefficient in an employment probit. Simulations indicate that as the probability of subsidy receipt increases from 0.0 to 0.5, the employment probability rises from .210 to .727 at the sample means of the other regressors. Meyers et al. do not have comparison groups available such as those used by Berger and Black, so it is difficult to determine the reliability of their estimates.

Gelbach (2002) estimated the impact on employment of the implicit child care subsidy provided by free public kindergarten for five year old children. To identify the effect of the subsidy, Gelbach exploited variation in quarter of birth of children and the fact that all states

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[2]Demonstrations and experiments that included child care subsidies were 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 National Evaluation of Welfare-to-Work Strategies, formerly known as the JOBS program (Hamilton et al., 1997; Hamilton, Freedman, and McGroder, 2000), the Minnesota Family Investment Program (Miller et al., 1997), the Florida Family Transition Program (Bloom et al., 1999), and the Gary, Seattle, and Denver Income Maintenance Experiments (Robins and Speigelman, 1978). See Crosby, Gennetian, and Huston (2001) for a comparison of the treatment effects of these demonstrations.

impose a date-of-birth requirement for entry to kindergarten. Gelbach used quarter-of-birth dummies as instrumental variables for enrollment in public school. He used data from the public use sample of the 1980 census on single mothers whose youngest child was aged five at the time of the census on April 1, 1980. His instrumental variable estimates indicate that access to free public school increased the employment probability by five percentage points at the interview date and by four percentage points during calendar year 1979. He also found positive effects on hours of work per week, weeks worked per year, and wage-salary income in 1979; and a negative effect on the probability of receiving public assistance in 1979.

The drastic nature of the 1996 welfare reform may make the pre-reform results of these three studies less relevant for predicting responses to current and future subsidies. Less emphasis was placed on moving welfare participants into employment before PRWORA. A mother might have been able to turn down a child care subsidy offer before PRWORA and remain out of the labor force without losing her welfare benefit. A mother who turned down a child care subsidy today would be more likely to lose eligibility for welfare. It seems plausible that a mother who is going to lose her welfare eligibility in any case would be likely to accept a subsidy offer and join the labor force. So the results of studies conducted in the pre-PRWORA environment will not necessarily be a good guide to behavior in the post-PRWORA era.

A final source of evidence on the impact of child care subsidies comes from studies of the effect of the price of child care. About two dozen studies have estimated the effect of the price of purchased child care on the employment behavior of mothers. One of the motivations for this literature is to infer how child care price subsidies would affect employment decisions. Whether inferences about the effects of subsidies drawn from this literature are useful depends on several factors. First, if there are substantial costs to taking up a subsidy, either in the form of

time costs required to negotiate the subsidy bureaucracy or psychic costs ("stigma") of participating in a means-tested program, then price effects on employment may not be a reliable guide to subsidy effects. Second, the price effects estimated in this literature are generally assumed to be linear, while most subsidies are nonlinear. Nonlinearity of a subsidy does not affect the qualitative result that a child care price subsidy increases the incentive to be employed, but it could affect the magnitude of the employment effect. Third, issues of specification and estimation of econometric models of price effects could affect the inferences drawn from such effects. Estimated price elasticities reported by the authors of the studies range from .06 to -1.26. Blau (2003) reviews these studies and concludes that differences in specification and estimation play an important role in producing variation in the estimates. See Anderson and Levine (2000), Blau and Hagy (1998), Kimmel (1998), and Tekin (2001) for recent examples of such studies.

4. Data

The National Survey of America's Families (NSAF) was conducted by the Urban Institute between February and October 1999.[3] It was designed to analyze the consequences of devolution of responsibility for social programs from the federal government to the states. The survey was conducted by telephone on a sample derived primarily from random-digit dialing.[4]

[3]An earlier round of the NSAF was conducted in 1997, with a different sample. A previous draft of this paper used data from the 1997 NSAF. In most cases, the results from the two waves are similar. We point out below instances in which they differ.

[4]Households without a telephone were also included in the sampling frame. Cellular telephones distributed by the survey organization were used to conduct interviews with such households.

Residents of 13 states[5] were over-sampled in order to allow detailed within-state analysis, and low-income households (income less than twice the federal poverty level) were over-sampled as well. The full NSAF sample includes 42,360 households. We select a subsample from the 13 over-sampled states consisting of households headed by an unmarried mother with at least one child under age 13. We focus on single mothers because they are the main target group for welfare reform. The great majority of families receiving cash transfers from public assistance programs are headed by a single mother (over 90 percent of TANF cases with an adult recipient in 1998; Committee on Ways and Means, 2000, p. 437). We use the 13 over-sampled states because the county of residence is identified for these states, if the county population exceeded 250,000. After excluding cases with missing data and in small counties, we have a sample of 2,461 households in 12 states.[6]

The main variables of interest are child care subsidies, employment status, and welfare status. 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. We code a family as receiving a child care subsidy if the mother reports that a welfare or social service agency pays for all or part of the cost of child care for any of the children in the family. Table 1 shows that 12.5 percent of our sample receives a subsidy by this measure (compared to 10.5 percent in the 1997 NSAF). The Administration for Children and Families (1999, 2000) estimates that 12-15 percent of eligible families received a CCDF subsidy in 1998-99. We

[5]Alabama, California, Colorado, Florida, Massachusetts, Michigan, Minnesota, Mississippi, New Jersey, New York, Texas, Washington, and Wisconsin.

[6]There were no counties in Mississippi with population over 250,000.

cannot determine eligibility in our sample, and undoubtedly some of the families in our sample are ineligible as a result of income in excess of the eligibility threshold[7]. So a 12.5 percent subsidy coverage rate is quite plausible. Employment is measured by whether the mother is employed as of the survey date, and welfare receipt is measured by whether the family receives cash assistance from TANF as of the survey date. The employment rate is 71.1 percent (compared to 67.9 percent in 1997) and the welfare participation rate is 17.1 percent (versus 21.9 percent in 1997). The NSAF also records whether the family received welfare at any time since January 1997, and whether the family received a child care subsidy during the first three months after leaving welfare, if the family was previously on welfare. In some specifications of our models we condition on these lagged dependent variables in order to control for unobserved heterogeneity that might be correlated with employment and subsidy receipt. 21 percent of the sample received welfare at some time since January 1997, and five percent received a child care subsidy in the first three months after leaving welfare since January 1997.

We expect that subsidy recipients would have a higher employment rate than non-recipients, since most child care subsidies are conditioned on employment or employment-related activities such as education, training, and job search. Table 1 shows that the employment rate is 78.9 percent among subsidy recipients and 70.0 percent among non-recipients. This is a significant but relatively small difference, and suggests that a substantial proportion of subsidy recipients may be in school, training, or unemployed. To explore this issue, we tabulated the reason for not working offered by mothers in our sample who received a child care subsidy and were not employed. 28 percent reported attending school as the reason for not being employed,

[7]We include all single mothers regardless of income, in order to avoid conditioning on income from employment and welfare, which make up the vast majority of income for our sample.

and another 42 percent reported being unable to find work, actively seeking work, or recently separated from a job. We refer to the latter group as "unemployed" for brevity. The remaining 30 percent reported "taking care of family," and other reasons that seem inconsistent with receiving a child care subsidy that has an employment or employment-related activity requirement.[8] It is not clear why these women are receiving a child care subsidy. One possibility is that their children are in Head Start or some other subsidized preschool program that does not have an employment requirement. The NSAF reports the type of child care used during the month prior to the survey, and includes Head Start as an option. 70 percent of the mothers who receive a subsidy and are not employed, in school, or unemployed report using Head Start. Thus in total, over 90 percent of non-employed subsidy recipients have a plausible reason for receiving a subsidy despite not being employed.

In order to examine the effects of child care subsidies on employment-related activities, we analyze a binary indicator for being enrolled in school (conditional on not being employed) and a binary indicator for being unemployed . As shown in Table 1, 3.3 percent of the sample is enrolled in school, and 11.2 percent is unemployed.

Table 1 shows that child care subsidy recipients are much more likely to be on welfare than non-recipients, 37% versus 14%. This is consistent with the stipulation of the CCDF that priority for subsidies should be given to families on welfare, families in work activities who are moving off welfare, and families at risk of going on welfare. The lower panel of Table 1 shows that child care subsidy receipt is almost three times as common for families on welfare (26.9 percent) compared to families not on welfare (9.5 percent). However, the employment rate of

[8]The other reasons include ill or disabled, couldn't afford child care, transportation problem, and being in prison.

mothers on welfare is only about 26 percent compared to 80 percent for mothers not on welfare (not shown in the table).

In the analysis that follows we condition on a small set of characteristics of the mother and her family, including her age, race, ethnicity, health status, education, presence of children by age, family structure, and nonwage income. Descriptive statistics for these variables are given in Table 2. In some specifications we include state dummies and county characteristics as well.

5. Model

Our goal is to model receipt of a child care subsidy, and the effect of subsidy receipt on outcomes such as employment and cash assistance. The econometric model consists of the following pair of equations:

$$S_i = X_i\$ + Z_{ci}(_c + ,_i \quad (1)$$

$$O_i = "S_i + X_i* + Z_{Oi}(_O + 0_i \quad (2)$$

where S_i is a binary indicator of subsidy receipt, O_i is a binary outcome such as an indicator of whether the mother is employed, X_i is a vector of family characteristics, the Z's are vectors of policy variables and other characteristics of the community of residence of the family, $,_i$ and 0_i are disturbances, and $, the (’s, ", and * are parameters. We specify linear equations for ease of estimation and interpretation.[9] The Appendix describes a behavioral model that is the basis for the specification of these equations. Equation (1) is a reduced form model of the receipt of a

[9]Two Stage Least Squares is much more straightforward with a linear model than with a nonlinear model. It is well-known that least squares estimates of coefficients in linear probability models are consistent estimates of average probability derivatives, but that standard errors are biased as a result of heteroscedasticity (Angrist and Krueger, 1999). We report standard error estimates that are robust to any form of heteroscedasticity.

child care subsidy. The demand for child care subsidies by families is determined by the price of child care, nonwage income, the mother's wage rate, preferences for consumption relative to leisure, the parameters of the subsidy program (reimbursement rate, co-payment, etc.), stigma associated with participating in a means-tested subsidy program, the psychic and time costs of establishing and maintaining eligibility for the subsidy, and so forth. These are determined in turn by observed family characteristics (X), observed features of the state and local child care subsidy system and the state and local economy (Z_c), and unobserved family and state-local characteristics (,). However, child care subsidies are rationed because the program is funded at a level too low to serve all eligible families.[10] Thus not all families who demand a child care subsidy receive one. Subsidies are rationed on the basis of observed family characteristics (X), observed features of the state and local child care subsidy system and economy (Z_c), and unobserved family and state-local characteristics (,). Thus (1) is a reduced form - we cannot distinguish the demand effects (a family's decision to apply for a subsidy) and supply effects (the agency's decision to award a subsidy) of X and Z_c, just the net effects on subsidy receipt.

Equation (2) is a model of the effect of receiving a child care subsidy on an outcome of

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[10]Two thirds of the states in our sample report that there is a waiting list for a child care subsidy (Schulman, Blank, and Ewen, 2001). In the other states, absence of a waiting list does *not* necessarily indicate absence of rationing. These states may simply turn away clients for whom funds are not available, without putting them on a waiting list. Given the evidence cited above that only 12-15 percent of eligible families are served by a CCDF subsidy, it is hard to imagine how states can avoid rationing unless a large majority of eligible families are unaware of their eligibility or the hassle cost of obtaining a subsidy is very high. The states that do not maintain waiting lists (CO, MI, NJ, WA, WI) served 20.3 percent of eligible families in 1998-99, while the states that did maintain waiting lists served 12.1 percent (Administration for Children and Families, 1999). Most of this difference is due to more stringent eligibility criteria for a subsidy in the former group of states. When the most generous eligibility criterion allowed by federal law (85 percent of state median income) is used, the percentage served is 11.7 for the former group and 9.0 for the latter group.

interest. The outcomes we analyze below include employment, school enrollment, unemployment, and welfare participation. As noted in the recent literature on treatment effects (Heckman, 1997, 1999; Angrist and Imbens, 1999), in a model such as (2) α does not have a well-defined economic interpretation. That is, α does not represent a ceteris paribus price effect, income effect, or some well-defined combination of them. Despite the absence of a sound economic interpretation of α, we follow the treatment effect literature (e.g. Angrist and Krueger, 1999) by estimating equation (2) and interpreting α as the "causal effect" of receiving a subsidy on the outcome of interest. We do this for two reasons: we do not have the data needed to estimate the parameters of a behavioral model[11], and this is the approach followed by previous studies of child care subsidies. If all families that receive a subsidy get the same dollar amount of assistance, and if all families have the same response to receiving a subsidy, then α can be interpreted as the ceteris paribus effect of being assigned a subsidy *and* accepting it. This parameter is of interest, but it is not a fundamental parameter of a behavioral model. In the Appendix we show that α depends on both preference parameters and the parameters of the mechanism used by administrators to assign subsidies.

The literature on child care subsidies discussed above emphasizes that γ_i and θ_i are likely to be correlated. A mother who is strongly motivated to work may also be motivated to seek a child care subsidy, imparting a positive correlation. Alternatively, the least employable mothers

[11]We do not have information on the amount of the subsidy, although in principle we could estimate it using the program rules and the relevant family characteristics. A structural model would contain the price of child care, the mother's wage rate, and nonwage income. We have substituted the determinants of these variables, so (2) is really a quasi-reduced-form model. This approach allows us to avoid the difficult problems of estimating wages and prices of non-workers and non-payers, respectively. See Tekin (2001) for an analysis that deals with these issues.

may be singled out for subsidies by administrators of the subsidy system, imparting a negative correlation. Our approach to identification is based on exclusion restrictions. At first glance, one might think that the rules of the state child care subsidy system would affect whether a family receives a subsidy, but conditional on receiving a subsidy would not affect the employment decision. In this case such variables would be included in Z_{ci} but could be excluded from Z_{oi}. However, we show in the Appendix that in general this is not true. Rules that determine eligibility for a child care subsidy affect how much a mother can earn and therefore the value of being employed and receiving a subsidy. Rules that determine the subsidy amount affect the value of being employed and receiving a subsidy. And since these rules vary only across states we would have to assume that there are no unobserved state-level determinants of employment and other outcomes, an implausible assumption even if other state-level covariates are included.[12]

The model we present in the Appendix suggests that the only valid identifying instruments in this model are factors that determine how subsidies are rationed. To identify ", we assume that these factors are determined at the county level, and we treat county dummies as identifying instruments. We control for state fixed effects in the employment and other outcome

[12]We found that adding state fixed effects to equation (2) always improved the fit compared to a model that included a set of state-level covariates. The state-level covariates included state policy variables such as the CCDF reimbursement rate, income-eligibility level, child care subsidy expenditure per capita, and other state-level variables such as the unemployment rate, median income, and the child poverty rate. Also, when we included these variables in the subsidy receipt equation (1), they had effects on subsidy receipt that were jointly and individually insignificantly different from zero. In contrast, state dummies have effects in (1) that are jointly significantly different from zero. We attribute the lack of effects of the policy variables together with strong effects of state dummies to the fact that all states ration subsidies, and rationing is the main determinant of subsidy receipt. Rationing mechanisms appear to differ across states in ways that are not captured by program rules and policies.

models, and therefore rely on within-state variation in subsidy receipt by county to identify the effects of subsidies. It would be plausible that the degree of rationing and subsidy receipt vary across counties within states if local program administrators generally have considerable flexibility in allocating subsidies (Carroll, 2001). Layzer and Collins (2000) report substantial variation across counties in the structure of the child care subsidy administration (see also Blank et al., 2001, and Mitchell et al., 1997).[13] We show below that county dummies have good explanatory power in first stage estimates of equation (1).

However, the validity of our estimates hinges on the assumption that there are no unobserved county-level determinants of employment within states, i.e., that county dummies can be excluded from equation (2). If this assumption is incorrect then our Two-Stage Least Squares (2SLS) estimates will be biased. For example, if local administrators who are relatively successful in getting child care subsidies to their clients are also good at getting clients into jobs, then county dummies should not be excluded from the employment equation. Or if the tightness of the county labor market is for any reason correlated with county child care subsidy rationing policy, then our identification strategy is invalid. In order to guard against this possible threat to the validity of our 2SLS estimates, we include in equation (2) 21 county-level variables that measure demographic and labor market characteristics of counties.[14]

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[13]Lemke et al. (2000) analyze the work behavior of child care voucher recipients in Massachusetts, using variation in local child care policy and other local variables to explain employment outcomes.

[14]These variables were collected from the City-County Data Book and County Business Patterns, and include population size; the age, race, ethnic, education, and sex structure of the population; median income; percent in poverty; land area, population density; employment and employment growth; local government employment; payroll; and the number of establishments. The county dummies are identifying instruments, so it is not possible to test the validity of excluding them

This model is similar to those estimated in previous analyses of the effects of child care subsidies, although the source of identification is different in each case. Gelbach's (2002) model is identified by quarter-of-birth of five year old children, which affects enrollment in kindergarten, but (by assumption) not employment. Meyers, Heintze, and Wolf (2002) identify the effect of a child care subsidy by excluding from the employment equation an indicator of how well the mother knows the rules of the child care subsidy system. Berger and Black (1992) use several comparison groups to sweep out various fixed effects. Their approach achieves identification through covariance restrictions: the disturbances are assumed to consist of a common fixed effect and independent idiosyncratic components. Sweeping out the fixed effects by assumption removes the source of the correlation between the errors of the subsidy and employment equations.

6. Results

Determinants of Subsidy Receipt

Table 3 presents estimates of equation (1), the model for receipt of a child care subsidy. The first column presents estimates without lagged dependent variables. The likelihood of subsidy receipt increases with the mother's age over the relevant age range. Blacks are more likely to receive a subsidy than whites and other races (other race is the reference group), and Hispanics are slightly more likely to receive a subsidy than non-Hispanics, other things equal. Mothers who have completed high school are about three percentage points more likely to receive a subsidy than high school dropouts (the reference group), while college graduates are

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from the second stage. However, we report below the results of a specification test for the validity of the identifying assumption.

three percentage points less likely to receive a subsidy than the reference group. Mothers with a child aged 0-5 but no child 6-12 are 2.3 percentage points less likely to receive a subsidy than mothers with children in both age groups (the reference category), and mothers with a child 6-12 and no child 0-5 are 8.8 percentage points less likely to receive a subsidy than mothers with children in both age groups. Higher non-wage income reduces the likelihood of receiving a subsidy, but the effect is quite small: a 10,000 increase in non-wage income would be predicted to reduce subsidy receipt by only 3.2 percentage points. The model also includes 114 county dummies, but the coefficient estimates are not shown. A specification test rejects the hypothesis that the effects of the county dummies are jointly zero with a p-value < .01.

The second column adds indicators for whether the mother participated in welfare at any time since January 1997, and whether she received a child care subsidy upon exiting welfare. Welfare participation in the recent past is associated with a 2.8 percentage point increase in the likelihood of child care subsidy receipt. Past child care subsidy receipt is associated with a 53 percentage point increase in the likelihood of subsidy receipt. The latter result indicates strong persistence over time in child care subsidy receipt. We cannot determine from these estimates whether this persistence results from unobserved heterogeneity, state dependence, or both. In this context, state dependence means that past receipt of a subsidy has a causal effect on the likelihood of current receipt, for example by increasing familiarity with the subsidy system, reducing stigma, or facilitating continued employment, which is itself a requirement for subsidy receipt. Unobserved heterogeneity means that there are persistent unobserved characteristics that affect subsidy receipt, both in the past and currently, and past subsidy receipt serves as a control for such unobserved characteristics while not having any causal impact on current receipt.

Effects of Subsidy Receipt

Table 4 presents estimates of the effect of receiving a child care subsidy on employment, school attendance, unemployment, and welfare participation. Each row presents estimates of " in equation (2) from a different specification or estimated by a different method. The first row in the upper panel presents OLS estimates from a specification of equation (2) that does not include lagged dependent variables. Receipt of a child care subsidy is associated with a 13 percentage point increase in the likelihood of employment, a two percentage point increase in the likelihood of attending school, no effect on the likelihood of unemployment, and a 15 percentage point increase in the likelihood of receiving welfare. The employment and welfare effects are significantly different from zero. Thus the estimates suggest that child care subsidies are associated with greater employment but also greater welfare participation. Most mothers who are on welfare do not work, and vice versa: only 8.4 percent of the sample works and receives welfare simultaneously. Another 4.3 percent attend school or are unemployed at the same time as receiving welfare, so 12.7 percent of the sample is in a work-related activity at the same time as being on welfare. The fact that receiving a child care subsidy is associated both with increased work-related activities and increased welfare participation probably results from the fact that current and former welfare recipients receive priority for a subsidy, and the subsidy has a work requirement.

The second row presents OLS estimates of a specification that adds the lagged dependent variables: welfare receipt since January 1997 and child care subsidy receipt following exit from welfare.[15] This has a minor effect on all outcomes except welfare receipt. Adding the lagged dependent variables causes the effect of child care subsidy receipt on welfare participation to fall

[15]The coefficient estimates for the other household-level covariates in this specification are given in Appendix Table B-1.

from 15 percentage points to one point. Thus, conditional on past welfare receipt, receiving a child care subsidy does not affect the likelihood of current welfare receipt. This suggests that child care subsidy receipt does not cause increased welfare receipt. Rather, child care subsidy receipt is more likely when a family has been on welfare in the past, and past welfare receipt is strongly associated with current welfare receipt.[16] As noted above, we refrain from giving a causal interpretation to the effects of the lagged variables, since we do not have the information needed to determine whether their effects are causal or simply control for unobserved heterogeneity.

The lower panel of Table 4 presents 2SLS estimates of the same two specifications as in the upper panel, using county dummies as identifying instruments. The estimated impact of child care subsidy receipt on employment in the 2SLS estimates is substantially larger than in the OLS estimates, and despite the larger standard errors, the estimate is significantly different from zero in the specification with lagged dependent variables.[17] The estimate in row 4 indicates that receiving a child care subsidy increases employment by 32 percentage points. This estimate is

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[16]Children who are enrolled in Head Start are classified here as subsidy recipients if the mother reported receiving a child care subsidy. We cannot determine from the data whether these cases receive an employment-related child care subsidy in addition to Head Start. We estimated models in which Head Start cases who had no plausible reason for receiving a work-related child care subsidy (employment, school enrollment, job search) were reclassified as not receiving a subsidy. This had negligible effects on the child care subsidy coefficient estimate.

[17]The standard errors in the 2SLS estimates are 5-6 times larger than in the OLS models. There are 114 counties included in the 12-state sample used here, and there is considerable variation in the child care subsidy receipt rate across counties within each of the 12 states. The coefficient of variation of the county-level receipt rate ranges from .20 to 1.58 and averages .79 across the 13 states. The (unweighted) average number of sample members per county is 12.7, which is relatively small and accounts for the increase in the standard errors in the 2SLS estimates. A Hausman test for the equality of the OLS and 2SLS estimates fails to reject equality.

much larger than Gelbach's estimate of .05, and is also larger than the estimates of Berger and Black (.08 to .25). It is closer in magnitude to the estimate of Meyers, Heintze, and Wolf (.52 for an increase in the probability of subsidy receipt from 0.0 to 0.5). However, differences in the policy environment, the nature of the samples, and the characteristics of the subsidy programs all make it difficult to determine whether our estimates can be meaningfully compared with the estimates of previous studies.[18]

The 2SLS results for school attendance are negative and larger in absolute value than the OLS estimates, but are not significantly different from zero. The effects on unemployment are positive, large, and significantly different from zero at the 10 percent level. This suggests that child care subsidies encourage job search by non-employed mothers. Finally, the 2SLS estimate of the effect of child care subsidy receipt on welfare participation is positive and much larger than the corresponding OLS estimate when lagged dependent variables are excluded. However, controlling for lagged welfare participation yields estimates that are small and insignificantly different from zero, very similar to the OLS estimates. The 2SLS results for welfare are thus similar to the OLS estimates in showing that the strong positive association between welfare and child care subsidy receipt is probably due to unobserved heterogeneity rather than a causal effect. Our results are quite different from those of Gelbach, who found a subsidy effect of -.04 on receipt of public assistance.

To summarize the results in Table 4, the main finding is that child care subsidies are associated with higher employment, with effects that are significantly different from zero and

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[18]The 2SLS results for subsidy effects on employment were quite different in estimates using the 1997 NSAF data. Those estimates were generally small and not significantly different from zero. This could be due to the fact that welfare reform was in a very early stage of implementation in 1997.

about three times larger in the 2SLS estimates than in the OLS estimates. The OLS estimate of the subsidy effect on employment is about 13 percentage points, and the 2SLS estimate is 32 percentage points, controlling for lagged dependent variables. These are both large effects, and indicate that child care subsidies may be an important determinant of employment among single mothers. Subsidy receipt has little impact on school attendance or welfare receipt (controlling for lagged welfare receipt). The 2SLS estimate of the effect on unemployment is positive and large, but not significantly different from zero with controls for the lagged dependent variables..

Evidence on the Validity of the Identification Assumption

The plausibility of the 2SLS estimates hinges on the validity of our identifying assumption that, conditional on state dummies and 21 county characteristics, county dummies can be excluded from the employment and other outcome equations. We cannot test this assumption directly, but we offer two types of indirect evidence on this issue. First, if the identifying assumption is valid, then variation across individuals in the predicted subsidy receipt variable will *not* reflect variation in county-level factors that might directly affect employment, such as labor market tightness and so forth. If this is correct, then the predicted subsidy receipt variable should have no effect on the employment rate of women who are categorically ineligible for a subsidy. The easiest group of such women to identify is women who are not mothers. We used the first stage subsidy receipt equation to generate a predicted subsidy receipt variable for a sample of 4,582 single childless women in the NSAF, and included it in a regression model to explain employment. The coefficient estimate on the predicted subsidy receipt variable was -.105 with a standard error of .121. This specification test thus provides no evidence against our identifying assumption: the coefficient estimate is of the wrong sign and smaller than its standard error for a population for which subsidy rationing *should* be irrelevant.

A second type of evidence is based on information about the amount of flexibility that county offices have in administering child care subsidies and other public assistance programs. If county offices have considerable flexibility in administering the child care subsidy program, but no flexibility in administering the TANF, food stamp, and other public assistance programs, this would suggest that our identifying assumption is valid. In this case, county dummies would pick up variation in county-level child care subsidy policy, which is what we want them to do, but *not* variation in county-level administration of other public assistance programs, which we do not want. We were unable to find any systematic documentation about this, so we directly contacted state officials and other knowledgeable individuals in each of the 12 states to seek information about the degree of local control (using contact information in Schulman, Blank, and Ewen, 2001).

The results of this effort are described in Table 5. Half of the 12 states report that their counties have extensive flexibility in setting child care subsidy reimbursement rates (the value of the voucher when it is redeemed by a provider), either by requiring counties to set the reimbursement rate at a specified percentile of the child care price distribution but allowing them to use the local price distribution, or by giving them guidelines to follow but not requiring that the reimbursement rate be set at any particular percentile of the distribution. The other states require all counties to set the same reimbursement rates. Three of the states give counties some flexibility in determining who is eligible for a subsidy (within the federal requirement of a maximum of 85 percent of state median income). For example, Colorado requires counties to serve families with income up to 130 percent of the poverty line, but gives them the choice of whether to serve families with income between 130 and 225 percent of poverty. The other nine states have uniform eligibility rules across counties. Half the state provide counties with

flexibility in some other aspect of the subsidy program, such as priority on the waiting list, parent co-payment rates, and the conditions under which a parent enrolled in school is eligible for a subsidy. In total, four states reported no flexibility for counties in any aspect of their child care subsidy program, two reported flexibility in only one aspect, four reported extensive but not complete county flexibility, and two reported complete local control.

Table 5 also shows the degree of control given to counties in administering the TANF program. The general pattern is that states with extensive local control in the child care subsidy program also have extensive local control in the TANF program. This pattern does not support our identifying assumption. Hence, the overall evidence on the validity of county dummies as instruments for child care subsidy receipt is mixed.

8. Conclusions

Child care subsidies are an important part of welfare reform, and funding for such subsidies has grown rapidly in the last few years. Yet there is little information available about whether child care subsidies have in fact contributed significantly to the goals of welfare reform. This paper presents evidence on child care subsidies received by single mothers with a child under age 13 from data collected in 1999, three years after the beginning of welfare reform. Child care subsidies were received by about 12 percent of the sample. Subsidy recipients were about 9 percentage points more likely to be employed than non-recipients, and about 13 percentage points more likely to be employed after controlling for family characteristics. Subsidy recipients were also about 3 percentage points more likely to be enrolled in school or unemployed, and about 23 percentage points more likely to be on welfare than non-recipients. The unemployment and welfare participation differences falls to almost zero after controlling for

family characteristics and past welfare receipt. Accounting for the possibility that receipt of a child care subsidy is endogenous increases the estimated employment impact to 32 percentage points and the unemployment impact to 20 percentage points.

There are several potentially promising avenues for further research on the determinants and consequences of child care subsidy receipt. The most pressing need is for survey data with information on whether families without a subsidy were ineligible, eligible but not offered a subsidy, or eligible and offered a subsidy but did not take it up. This would make it possible to do a more convincing analysis of the causal impact of subsidy receipt. A second useful approach would be to combine survey data with administrative records from the subsidy program, as in Berger and Black (1992). This would provide the possibility of constructing comparison groups, such as families on waiting lists for a subsidy. Finally, an experiment in which eligible families are randomly assigned to receive a child care subsidy may offer the best opportunity to determine the impact of child care subsidies on employment and welfare participation.

Appendix A

We develop a simple static model of behavior as a basis for specifying an empirical model. Assume that a young child requires continuous care by an adult. The mother provides child care during her leisure hours. During her work and work-related hours she can receive free child care from a relative or purchase child care in the market, but she cannot care for the child while working, attending school, or engaging in other work-related activities. The relative divides her time between child care and leisure, with employment ruled out. For simplicity, we assume that all non-maternal child care is either unpaid or purchased, but not a combination of the two.[19] A child care subsidy can be received if the mother is employed or if she is not employed but is in a work-related activity such as education or job search. There may be direct disutility from receiving welfare or a child care subsidy, as a result of stigma. A subsidy can be received only if income is below the subsidy eligibility limit *and* the family is offered a subsidy. Welfare can be received only if income is below the welfare eligibility limit, but for simplicity we assume there is no rationing of welfare assistance (i.e., no time limits or sanctions). We assume that a mother can either work or be in some other work-related activity, but she cannot do both. She can receive welfare while working or in a work-related activity, or while doing neither. We model work-related activities as providing utility, which is an ad hoc way of capturing the value to the mother of future wage increases caused by education, training, and job search. The utility function, time constraints, budget constraint, and non-negativity constraints are as follows:

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[19]We do not empirically analyze the choice of paid versus unpaid care or the employment decision of the relative, but these choices are included in the theory to account for the use of unpaid child care.

$$U = U(c, R_m, R_r, a, q_s s, q_W W)$$

$$R_m + h + a = 1, \qquad R_r + I = 1, \qquad H + I = h + a, \qquad IH = ha = 0^{20}, \ c>0$$

$$c = Y + hw - pH \qquad \text{if } s=0 \text{ and } W=0$$

$$c = (Y + hw)(1-t_s) - (p-r)H \qquad \text{if } s=1 \text{ and } W=0, \text{ where } Y + hw \# E_s$$

$$c = B + (Y+hw)(1-t_W) - pH \qquad \text{if } s=0 \text{ and } W=1, \text{ where } Y + hw \# E_W$$

$$c = B + (Y+hw)(1-t_W-t_s) - (p-r)H \qquad \text{if } s=1 \text{ and } W=1, \text{ where } Y + hw$$

$\#\min\{E_s, E_W\}$

$$0 \# R_m, h, R_r, I, H, a \# 1,$$

where:

U	=	utility
c	=	consumption
R_m	=	the mother's leisure hours
R_r	=	the relative's leisure hours
a	=	the mother's hours spent in work-related activities (excluding employment)
q_s	=	the disutility of receiving a subsidy
q_W	=	the disutility of receiving welfare
s	=	binary indicator of subsidy receipt
W	=	binary indicator of welfare receipt
h	=	the mother's hours of work
I	=	hours of unpaid child care by the relative
H	=	hours of paid child care purchased in the market
Y	=	nonwage income
w	=	the mother's wage rate
p	=	the price per hour of child care
t_s	=	the rate at which child care benefits are reduced as earnings increase
r	=	the subsidy rate per hour of child care if income is zero
E_s	=	the income eligibility limit for a child care subsidy
B	=	the welfare benefit if not employed
E_W	=	the income eligibility limit for welfare
t_W	=	the rate at which welfare benefits are reduced as earnings increase
R	=	a binary indicator =1 if an eligible family is offered a subsidy, =0 otherwise.

[20]This constraint captures the assumptions that a mother can use either informal or formal child care but not both, and that she can be employed or in a work-related activity, but not both.

The family chooses R_M, h, *a*, R_r, I, H, c, W, and s to maximize utility subject to the constraints. There are four scenarios to consider.

1. The family is ineligible for welfare regardless of hours worked ($Y>E_W$), and is either ineligible for a child care subsidy regardless of hours worked ($Y>E_s$) or is eligible but rationed out ($Y\#E_s$, R=0). In this case s=W=0 because subsidy and welfare receipt are not part of the choice set. The family then chooses from among the first five discrete alternatives listed in Appendix Table A-1.

2. The family is ineligible for welfare ($Y>E_W$), potentially eligible for a subsidy, and a subsidy is offered ($Y\#E_s$, R=1). In this scenario the family makes a choice from the first seven alternatives listed in the table. Alternatives (1)-(5) are the same as in the first scenario. In alternatives (1), (2), and (4) no paid child care is used, so no subsidy is received. In alternatives (3) and (5) the family pays for child care and is therefore eligible for a subsidy, but chooses not to take up the subsidy. In alternatives (6) and (7) the subsidy is accepted and hours of work are low enough so that income does not exceed the eligibility limit.

3. The family is eligible for welfare ($Y<E_W$), and potentially eligible for a subsidy, but a subsidy is not offered ($Y\#E_s$, R=0). In this scenario the family faces alternatives 1-5 and 8-12. Alternatives 8-12 are the same as 1-5 except for welfare receipt. In alternatives 8-12, hours of work are low enough so that income does not exceed the welfare eligibility threshold.

4. The family is eligible for welfare ($Y<E_W$), potentially eligible for a subsidy, and a subsidy is offered ($Y\#E_s$, R=1). In this scenario the family faces all 14 of the alternatives listed in the table. The new alternatives in this scenario are 13-14, in which the family receives both welfare and a child care subsidy.

The value of receiving a subsidy in this model is

$$V(s=1) = \text{Max}\{V_6(Y, E_s, p, r, w, q_s, t_s), V_7(Y, E_s, p, r, q_s, t_s),$$

$$V_{13}(Y, E_s, p, r, w, q_s, t_s, E_W, q_W, t_W, B), V_{14}(Y, E_s, p, r, q, t_s E_W, q_W, t_W, B)\}$$

where V_i is the indirect utility function associated with alternative i. The value of not receiving a subsidy is

$$V(s=0)=\text{Max}\{V_1(Y), V_2(Y, w), V_3(Y, w, p), V_4(Y), V_5(Y,p), V_8(Y, E_W, q_W, t_W, B),$$

$$V_9(Y, w, E_W, q_W, t_W, B), V_{10}(Y, w, p, E_W, q_W, t_W, B), V_{11}(Y, E_W, q_W, t_W, B),$$

$$V_{12}(Y, p, E_W, q_W, t_W, B)\}.$$

A subsidy is received if $V(s=1) > V(s=0)$ *and* $Y+wh^* \# E_s$ *and* $R=1$, where h^* is optimal hours of work. Otherwise a subsidy is not received. A reduced form model of subsidy receipt derived from this framework therefore has the form

$$s=s(Y, E_s, p, r, w, q_s, t_s, E_W, q_W, t_W, B, R). \quad \text{(A1)}$$

The probability of employment *conditional* on receiving a subsidy is

$$\Pr(e=1|s=1)=\Pr\{\max\{V_6(Y, E_s, p, r, w, q_s, t_s), V_{13}(Y, E_s, p, r, w, q_s, t_s, E_W, q_W, t_W, B)\}$$

$$> \text{Max}\{V_7(Y, E_s, p, r, q_s, t_s), V_{14}(Y, E_s, p, r, q, t_s E_W, q_W, t_W, B)\})$$

The probability of employment conditional on not receiving a subsidy is

$$\Pr(e=1 \mid s=0) = \Pr(\text{Max}\{V_2(Y, w), V_3(Y, w, p), V_9(Y, w, E_W, q_W, t_W, B),$$

$$V_{10}(Y, w, p, E_W, q_W, t_W, B)\}$$

$$> \text{Max}\{V_1(Y), V_4(Y), V_5(Y,p), V_8(Y, E_W, q_W, t_W, B), V_{11}(Y, E_W, q_W, t_W, B),$$

$$V_{12}(Y, p, E_W, q_W, t_W, B)\})$$

Hence the probability of employment conditional on subsidy receipt status has the form

$$e = e(s, Y, E_s, p, r, w, q_s, t_s, E_W, q_W, t_W, B) \quad \text{(A2)}$$

Models for work-related activity, welfare, and combinations of the outcomes have the same form as (A2). E_s appears in the employment model because in alternatives 6-7 and 13-14 a subsidy can

be received only if earnings plus other income is less than the eligibility limit. And r and t_s appear because the value of the subsidy influences the relative attractiveness of employment. This demonstrates the assertion in the text that subsidy program rules cannot be excluded from the employment outcome equation.

In principle, there are two possible estimation strategies for this model. One is to estimate the multinomial discrete choice model as specified above. Unfortunately, this is not feasible because we do not observe R, the rationing indicator. R determines the choice set (i.e., which of the four scenarios described above is relevant). Without this information, we would be forced to assume that R=1 for everyone, resulting in people who have been rationed out of a subsidy being incorrectly assumed to have the option of taking up a subsidy.

The other alternative is to estimate the system of equations (A1)-(A2) by Two Stage Least Squares (2SLS). Notice that the employment probability conditional on subsidy status does not depend on R, so R is in principle a valid identifying instrument. We do not observe R, but we assume that county dummies determine R. For this strategy to produce consistent estimates, R must not correlated with any variables in (A2) except for s.

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Table 1
Distribution of Employment, Work-Related Activities, Welfare, and Child Care Subsidies

	All	Receives a child care subsidy	No child care subsidy
Percent employed	71.1	78.9	70.0
Percent in school	3.3	5.8	2.9
Percent unemployed	11.2	13.6	10.9
Percent on welfare	17.1	37.0	14.3
Percent received a child care subsidy in the past	5.2	28.9	1.8
Percent received welfare in 1996	21.1	45.8	17.6
Sample size	2,461	308	2,153

	Percent receiving a CC subsidy	
All	12.5	
	Yes	No
Employed	13.9	9.1
In school	22.5	12.2
Unemployed	15.2	12.2
On welfare	26.9	9.5

Source: Tabulations from the 1999 National Survey of America's Families.

Table 2: Descriptive Statistics

Variables	Mean (Std. Dev.)	
Dependent Variables		
Subsidy	0.125	(0.33)
Work	0.711	(0.45)
In school	0.032	(0.18)
Unemployed	0.113	(0.32)
Welfare	0.172	(0.38)
Explanatory Variables		
Mother's age	32.0	(7.3)
Race[a]		
Black	0.33	(0.47)
White	0.64	(0.48)
Hispanic	0.24	(0.43)
Mother is in good health	0.84	(0.37)
Family Size	3.7	(1.4)
Non-wage Income (/1000)[b]	3.38	(7.82)
Mother's Education[c]		
12-15 years	0.71	(0.46)
16 + years	0.14	(0.35)
Presence of children[d]		
At least one child#5 present	0.28	(0.45)
At least one child between 6-12 present	0.42	(0.49)
Lagged dependent variables		
Welfare in the past	0.21	(0.41)
Child care assistance in the past	0.05	(0.22)
Number of observations	2,461	

Source: Tabulations from the 1999 NSAF.
Note: Standard deviations are in parentheses
[a]Omitted category is other
[b]Nonwage income includes all family income during 1996 except the mother's earnings and income from means-tested programs.
[C]Omitted category is less than high school
[d]Omitted category is the presence of at least one child in each age category

Table 3: Determinants of Receipt of a Child Care Subsidy

	Without Lagged Variables	With Lagged Variables
Received welfare since Jan.1997		.028 (.017)
Received a child care subsidy after leaving welfare		.529 (.030)*
Age	-.011 (.008)	-.006 (.007)
Age squared/100	.112 (.118)	.055 (.109)
Black	.085 (.039)*	.057 (.036)
White	-.010 (.037)	-.015 (.035)
Hispanic	.016 (.019)	.015 (.017)
Good health	-.007 (.018)	-.005 (.017)
Education 12-15	.033 (.020)	.030 (.018)
Education 16+	-.031 (.026)	-.025 (.025)
Nonwage Income/1000	-.0032 (.0009)*	-.0019 (.0008)*
Family Size	-.0091 (.0054)	-.0122 (.0050)*
Children aged 0-5 only	-.023 (.020)	-.027 (.018)
Children aged 6-12 only	-.088 (.018)*	-.070 (.017)*
R^2 (n)	.12 (2,461)	.24 (2,461)

Note: County dummies are also included in the model. The F-statistic for a test of the hypothesis that the effects of the county dummies are jointly zero is 1.90, which rejects at better than 1 percent. Standard errors (corrected for arbitrary forms of heteroscedasticity) are in parentheses.

* indicates that the coefficient estimate is significantly different from zero at the five percent level.

Table 4: Effects of Receiving a Child Care Subsidy

Lagged Dependent Variables Included	Employed	In School	Unemployed	On Welfare
OLS Estimates				
1. No	.130 (.026)*	.022 (.015)	-.000 (.021)	.148 (.029)*
2. Yes	.125 (.027)*	.029 (.015)	-.004 (.022)	.013 (.016)
2SLS Estimates				
3. No	.167 (.153)	-.066 (.061)	.301 (.111)*	.469 (.143)*
4. Yes	.325 (.157)*	-.043 (.058)	.202 (.121)	.017 (.069)

Notes: The complete results for the models in row 2 are given in Appendix Table B-1. Identifying instruments in the 2SLS models are county dummies. Standard errors (corrected for arbitrary forms of heteroscedasticity) are in parentheses.

a. The lagged dependent variables are welfare participation since January 1997, and receipt of a child care subsidy after leaving welfare.

* indicates that the coefficient estimate is significantly different from zero at the five percent level.

Table 5: County Flexibility in Child Care and Public Assistance Programs

State	How Much Local Control in the Child Care Subsidy Program?			How Much Local Control in the TANF Program?			
	Reimburse-ment Rate	Eligibility	Other aspects	Benefit	Hours requirement	Activity[1]	Other
Alabama	local market[2] rate survey	none	none	none	none	none	none
California	none	none	waiting list[3]	none	none	extensive[3]	none
Colorado	extensive	extensive	state control of parent fee	extensive[4]	extensive[4]	extensive[4]	mixed[4]
Florida	extensive	none	local control of parent fee	none	none	none	none
Massachusetts	none	none	none	none	none	none	none
Michigan	none	none	none	none	some	none	disability[5]
Minnesota	none	none	priority order: a bit	none	some[6]	none	none
New Jersey	none	none	none	none	none	none	none
New York	extensive	extensive	extensive	extensive[7]	some[7]	some[7]	some
Texas	extensive	extensive	extensive	extensive	extensive	extensive	extensive
Washington	none	none	none	none	none	none	none
Wisconsin	local market rate survey	none	a bit[8]	none	some flexibility[8]	some flexibility[8]	none

Source: Telephone conversations with state officials.

Notes: 1. Activity refers to which activities can satisfy the TANF work requirement. Most states have a list of acceptable activities, and guidelines about which activities have priority, but it is typically up to individual caseworkers to negotiate an activity with the client.

2. Local market rate survey indicates that survey of child care fees used to determine the reimbursement rate to providers is location-specific rather than state-specific.

3. In California, counties have the discretion to add certain groups to the priority list for a child care subsidy: disability cases and cases with limited English-speaking ability. Counties have discretion over which activities other than employment can be used to meet the minimum hours requirement.

4. In Colorado, the state sets minimum levels for TANF benefits and work hours, but counties can increase both. The state imposes no restrictions on acceptable activities beyond the federal restrictions. There is no flexibility on time limits, but counties do have flexibility on most other aspects of the TANF program.

5. In Michigan, counties have some flexibility in how disability cases are treated.

6. In Minnesota, the number of hours for which clients are required to participate is set by state law, but caseworkers can depart from the requirement.

7. New York: TANF benefits vary across counties, but are set by the state. Counties have substantial flexibility in how work hour requirements are fulfilled. Exemptions to the work requirement are determined by state law, but interpretation varies by county.

8. In Wisconsin, eligibility for a child care subsidy while enrolled in school requires that the client be employed as well, with the number of hours of employment determined locally. In the TANF program, the state sets the basic parameters, but states have some flexibility in implementation.

Table A1: Discrete Alternatives in the Theoretical Model

Alter-native	Empl-oyed	Work-related activity	Child care	Welfare	Child care subsidy	Choice variables
1			none			h = I = H = W = s = 0
2	yes		informal			I=h>0, *a*=H=W=s=0
3	yes		formal			H=h>0, *a*=I=W=s=0
4		yes	informal			I=*a*>0, h=H=W=s=0
5		yes	formal			H=*a*>0, h=I=W= s=0
6	yes		formal		yes	H=h>0, *a*=I=W=0, s=1; Y + hw #E_s
7		yes	formal		yes	H=*a*>0, h=I=W=0, s=1;Y + hw # E_s
8			none	yes		h = I = H = s =0, W=1; Y + hw # E_W
9	yes		informal	yes		I=h>0, *a*=H=s=0, W=1; Y+ hw # E_W
10	yes		formal	yes		H=h>0, *a*=I=0, s=0, W=1; Y + hw # E_W
11		yes	informal	yes		I=*a*>0, h=H=s=0, W=1; Y + hw # E_W
12		yes	formal	yes		H=*a*>0, h=I=0, s=0, W=1; Y + hw # E_W
13	yes		formal	yes	yes	H=h>0, *a*=I=0, s=W=1; Y + hw #E_W
14		yes	formal	yes	yes	H=*a*>0, h=I=0, s=W=1; Y + hw # E_W

Note: See the Appendix text for a description of the model.

Table B-1: Additional Results from OLS Estimates of the Outcome Equations

Outcome:	Employed	In School	Unemployed	On Welfare
Age	.024 (.011)*	-.015 (.005)*	-.022 (.008)*	.003 (.005)
Age squared/100	-.344 (.157)*	.204 (.077)*	.292 (.115)*	-.053 (.076)
Black	.011 (.049)	-.024 (.027)	-.002 (.038)	-.048 (.018)*
White	.027 (.048)	-.034 (.027)	-.029 (.037)	-.042 (.017)*
Hispanic	-.063 (.025)*	-.003 (.011)	.042 (.019)*	-.000 (.012)
Good health	.108 (.026)*	-.000 (.010)	-.001 (.019)	-.002 (.013)
Educ 12-15	.215 (.029)*	.007 (.012)	-.062 (.023)*	-.004 (.015)
Educ 16+	.281 (.035)*	-.005 (.013)	-.101 (.025)*	.008 (.015)
Family size	-.020 (.008)*	-.002 (.003)	.001 (.005)	.008 (.004)*
Nonwage income/1000	-.0039 (.0014)*	.0000 (.0005)	.0004 (.0008)	-.0029 (.0006)*
Children aged 0-5 only	.003 (.027)	-.008 (.013)	-.011 (.020)	.019 (.013)
Children aged 6-12 only	.083 (.024)*	-.002 (.010)	-.009 (.017)	.005 (.011)
Lagged child care subsidy	.218 (.045)*	-.046 (.021)*	-.075 (.038)*	-.076 (.039)
Lagged welfare	-.251 (.027)*	.027 (.013)*	.114 (.022)*	.776 (.020)*
CC subsidy	.125 (.027)*	.029 (.015)	-.004 (.022)	.013 (.016)
Intercept	.663 (1.342)	.084 (.622)	.969 (.686)	-.091(.527)
R^2	.18	.04	.07	.73

Notes: The models also include state dummies and 21 county characteristics. Sample size is 2,461. The estimates correspond to those in row 2 of Table 4.

* indicates that the coefficient estimate is significantly different from zero at the five percent level.