CHILD SUPPORT ENFORCEMENT POLICY: EFFECTS ON FAMILIES AND THE WELFARE SYSTEM

by

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ABSTRACT

With the potential to improve the economic situation of single mother families and reduce the nation's welfare costs, Child Support Enforcement (CSE) has emerged as an important policy tool in the welfare reform effort. This thesis examines whether the potential benefits of government CSE efforts are achieved. In particular, I evaluate the effectiveness of the government CSE program in terms of improving child support outcomes, strengthening families, and lowering welfare costs.

In Chapter 1, I use state level data for the 1979-1991 period to estimate the effect of CSE program spending on CSE collections and state Aid to Families with Dependent Children (AFDC) expenditures. Total CSE collections are estimated to increase by $1.93 for each additional $1 spent on CSE. However, I find that this overall result is composed of relatively low returns for the AFDC caseload in the CSE system combined with high returns for the non-AFDC caseload. I also find that during the 1980s, CSE expenditures alone were not a cost-effective way to reduce AFDC costs.

Chapter 2 considers the impact of CSE on marital dissolution and welfare participation. My results suggest that CSE deters marital breakup of couples with children and therefore reduces entry into single motherhood. Second, I examine the effect of CSE and child support income on AFDC participation among single mothers. My results show that increases in CSE reduce welfare participation rates. Using state variation in CSE to identify the effect of individual child support income, I find that a $100 increase in child support income reduces the probability of AFDC participation by approximately 5.5%.

Finally, Chapter 3 examines the effect of CSE on the probability of having a child support award, which is a necessary condition for receiving child support payments. The chapter focuses on whether CSE has different effects on mothers in

different marital status groups. My results suggest that CSE raises the award rates of never-married and separated mothers, but not divorced and remarried mothers. Additional estimates provide evidence that this marital status pattern may stem from different rates of contact with CSE through the AFDC program.

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INTRODUCTION

The high cost of providing public assistance to increasing numbers of poor single mother families and public concern regarding possible long-term consequences of childhood poverty have put welfare reform at the top of the national agenda. Offering the potential to improve the economic well-being of single mothers and their children, shrink welfare rolls, and shift the burden of support for children from the general taxpayer to the child's own parent, child support enforcement has emerged as an important policy tool in the welfare reform effort. My dissertation examines to what extent the potential benefits of child support enforcement policy are actually achieved. Taken together, the three chapters address a set of interrelated questions regarding the effects of the government Child Support Enforcement (CSE) program on child support outcomes, single motherhood, and the United States welfare system.

The remainder of this introduction is organized as follows. Section 1 provides background on the importance of child support in the United States. This is followed by brief summaries of the central findings and implications of each of the three thesis chapters in Section 2.

1. Background

Between 1960 and 1990, the percent of children living in single mother families increased from 8% to 25% (Beller and Graham, 1993). By 1990, a total of 16 million children were currently living apart from their fathers and therefore were eligible to receive child support (U.S. Department of Health and Human Services (DHHS), 1992). It is also estimated that 6 out of every 10 children born in the mid-1980s will spend some portion of their childhood in a single parent family (Beller and Graham, 1993). Increases in both marital dissolution and out-of-wedlock childbearing have contributed to the rise in single motherhood. The divorce rate rose steadily during the 1960s and 1970s reaching a peak of 5.3 divorces per 1,000 population in 1981. For the rest of the 1980s, the divorce rate remained relatively flat at around 5.0 per 1,000 population (Meyer, 1995). Approximately 25 children

per 1,000 under the age of 18 currently experience the divorce of their parents each year, and it is estimated that 30% of children experience marital breakup of their parents at some time during childhood (Haveman and Wolfe, 1994). The second key factor in the growing fraction of children requiring child support has been the increasing out-of-wedlock birth rate. Unlike divorce, this trend continued through the 1980s. In particular, the percent of births to unmarried women grew from 5.3% in 1960, to 10.7% in 1970, 18.4% in 1980, and 29.5% in 1991 (U.S. DHHS, 1993; Haveman and Wolfe, 1994). By 1990, 7.6% of all children under the age of 18 were living with a never-married mother, compared to only 0.4% in 1960 (U.S. House of Representatives, 1992).

The growth in single mother families is an important public policy concern for several reasons. First, recent research has shown that childhood in a single mother family increases the likelihood of dropping out of high school, teenage pregnancy, labor market difficulties, poverty, and welfare dependence later in life (Beller and Graham, 1993; McLanahan, 1985, 1988; Krein and Beller, 1988; Shaw, 1982). These outcomes clearly have negative implications for future economic productivity and government costs. This line of research has also shown that low income is an important factor in the total disadvantage associated with childhood in a single mother family. In 1990, the poverty rate of children living with single mothers was 53.4% compared to 20.6% for all children (U.S. DHHS, 1993; U.S. House of Representatives, 1992). As many poor, single mother families turn to public assistance programs for financial support, this poverty not only contributes to the future outcomes of children, but also to current government welfare costs. In 1990, an average of 12.9 million single mothers and children received Aid to Families with Dependent Children (AFDC) benefits each month costing the government a total of $20.9 billion.

The widespread failure of absent fathers to provide financial support for their children is clearly one factor contributing to the poverty and welfare dependence in single mother families. In 1989, only 37% of mothers with children from an absent father received any child support (U.S. House of Representatives, 1992). The other

63% received nothing, either because a child support award had not been established or there was an existing award but no payments were made. Even among those mothers with awards in place, only 65% received any child support and only 44% received the full amount owed. One recent estimate suggests that absent fathers in the U.S. had the financial ability to pay a total of $49.5 billion in child support in 1989 (Miller, Garfinkel, and McLanahan, 1993). However, in that year, child support awards in the amount of only $16.3 billion were in place and actual payments totalled only $11.2 billion (U.S. House of Representatives, 1992).

In 1975, as the number of children in need of child support was beginning to grow and the implications of unpaid child support were becoming apparent, the government enacted Title IV-D of the Social Security Act establishing the Child Support Enforcement (CSE) program. Over the past twenty years, the government has pursued CSE with the joint goals of lowering welfare costs and improving the economic well-being of single parents and their children. In 1992, $1.99 billion was spent on the CSE program to collect a total of $7.96 billion in child support. The three chapters of this dissertation examine several important effects of CSE policy.

2. Chapter Summaries

2.1 Is Child Support Enforcement Spending Cost Effective? Measuring Effects on Collections and AFDC Costs

The first chapter considers the effectiveness of CSE expenditures during the 1979-1991 period on two fronts: first, raising the child support collections of families who participate in the CSE program, and, second, reducing government expenditures on the AFDC program. I approach these questions from a state-level perspective using within-state, over-time variation in CSE expenditures to identify the parameters of interest. I find that total CSE collections increase by $1.93 for an additional $1 spent on CSE. However, my results also suggest that CSE expenditures are much more effective at raising child support collections for the non-AFDC families who choose to use CSE services than for families on AFDC, all of whom are required to participate in CSE. Specifically, the return for the non-AFDC caseload exceeds that

for the AFDC caseload by a factor of approximately 27. The second key finding is that increases in government CSE expenditures do appear to reduce AFDC costs, but the estimated tradeoff is less than one-for-one. At variable means, a $1 increase in CSE spending is associated with a $.78 decrease in state AFDC payments.

Several recommendations for further research and policy efforts emerge from these findings. First, my results suggest that to raise total CSE program collections at the lowest cost to taxpayers, relatively more should be spent on the non-AFDC caseload and recent efforts to increase non-AFDC families' participation in the CSE program should be continued. On the other hand, if the primary policy goal is to help current AFDC recipients exit the welfare system, further research is first needed to identify the underlying reason for the ineffectiveness of CSE spending in terms of raising AFDC families' child support collections. Determining to what extent this result stems from fathers' lack of income, the disincentives created by the AFDC 100% tax rate on child support, or problems at earlier stages in the child support process, such as lack of paternity establishment or awards, will enable policy makers to target future enforcement efforts towards this group more effectively.

2.2 Child Support Enforcement, Marital Dissolution, and Welfare Participation

The second chapter examines the effect of CSE on marital dissolution and AFDC participation at the individual level. My results for marital dissolution indicate that CSE reduces the probability of divorce or separation among couples with children. Since CSE is expected to lower the mother's costs of marital dissolution by raising her income in the single mother state, this finding suggests that the opposing effect on the father is dominant. In a control group of women ineligible for child support, I find no effect of CSE on the probability of marital dissolution. These results provide evidence that by raising the financial responsibility of fathers to their children, CSE does succeed in strengthening families, as measured by a decrease in marital dissolution among couples with children. In turn, it is possible that stronger CSE results in fewer single mother families living in poverty and in smaller welfare

caseloads. For these latter two effects to be realized, CSE must deter divorce among women who are likely to be poor as single mothers.

The second part of this chapter provides estimates of the effect of the CSE program and child support income on the probability a single mother receives AFDC. The results indicate that increases in state CSE effectiveness are associated with lower probabilities of AFDC participation, particularly among never-married and recently divorced or separated single mothers. To obtain a consistent estimate of the effect of actual child support income on AFDC participation, I use cross-state variation in CSE to purge individually reported child support income of measurement error and unobserved heterogeneity. Using this strategy, I find that a $100 increase in annual child support income decreases the likelihood of AFDC participation among single mothers by approximately 5.5%. Therefore, to the extent that CSE can raise child support income for single mothers, it will succeed in its goal of reducing welfare dependency. As shown in Chapter 1, CSE expenditures are associated with increased collections for single mothers who use CSE services, though the increase is quite small for current AFDC recipients.

2.3 Child Support Awards and Marital Status: Does "One Size Fits All" Apply to Enforcement Policy?

The third chapter examines how the government CSE program affects the child support award rates of custodial mothers in different demographic groups, with a particular focus on variation by marital status. This question is studied using individual level data from a series of six national surveys of mothers with children from an absent father covering the 1978-1989 period, combined with data on state CSE program agencies for the same years. The results show clear evidence of between-group differences in the effects of CSE on award probabilities. In particular, for never-married and separated mothers I find strong effects of the CSE program on awards, while for divorced and remarried mothers there is no evidence of an effect. Part of the explanation for the marital status pattern in these results may be that in the aggregate population of mothers with children from an absent father,

never-married and separated mothers have higher contact with the CSE program via participation in AFDC. Estimates which allow the effect of CSE to vary between other demographic groups of custodial mothers with relatively high and low AFDC participation rates respectively, provide empirical support for this explanation.[1]

There are several important implications of the results of Chapter 3. First, it becomes evident that "one size fits all" is not an accurate characterization of CSE policy. Therefore, treating all custodial mothers alike in the evaluation of policy efforts may generate misleading conclusions. Second, one of the clear goals of the recent welfare reform proposals is to remove current recipients from the welfare rolls. A potential route to achieving this goal is to raise child support collections for this group. In Chapter 2 of this thesis, I find that increased child support income does significantly reduce AFDC participation rates, but in Chapter 1, I find evidence that raising child support income for AFDC families through CSE program efforts is very costly. If a lack of child support awards is, in fact, the major barrier obstructing efforts to raise collections for this group, then the results of Chapter 3 are encouraging for the welfare reform effort. In this case, future CSE policy efforts aimed at raising award rates for mothers at high risk of AFDC dependence are recommended.

[1] Given the results of Chapter 1, which suggest that CSE spending has relatively large effects on non-AFDC families and only weak effects on AFDC families, the results of Chapter 3 may seem surprising at first. However, these two sets of results can be reconciled by considering several key differences between the analyses, and this is discussed in detail in the concluding section of Chapter 3. To summarize, one basic difference is that Chapter 1 looks at effects of CSE spending within the CSE system, while Chapter 3 considers CSE effects in the entire population of mothers eligible for child support, only a fraction of whom actually have direct contact with the CSE program. Secondly, the outcome considered in Chapter 1 is dollars of child support collected, while in Chapter 3 it is the probability of having a child support award.

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CHAPTER 1

Is Child Support Enforcement Spending Cost Effective? Measuring Effects on Collections and AFDC Costs

1. Introduction

Rising rates of out-of-wedlock childbearing and divorce in the United States in recent decades have led to large increases in the number of children living apart from their fathers. As of 1990, approximately 1 out of 4 children under the age of 18 lived in a family with an absent father, compared to only 1 out of 10 children in 1970 (U.S. Bureau of the Census, 1991). While absent fathers are legally required to provide financial support to their children in the form of child support payments, many fail to meet this obligation. According to recent government statistics, only 37% of mothers with children from an absent father received child support payments in 1989. Even among single mothers with a child support award established, only 65% received any payments, and only 44% received the full amount owed (U.S. House of Representatives, 1992).

In 1990, 45% of families with an absent father had incomes below the federal poverty line (U.S. House of Representatives, 1992). Lack of child support income is clearly one factor contributing to this high poverty rate. The fact that many of these poor single mothers turn to public welfare programs for assistance has important implications for government costs. In 1990, 46% of the total poverty population and 60% of children in poverty were recipients of Aid to Families with Dependent Children (AFDC) costing the government a total of $18.5 billion in that year (U.S. House of Representatives, 1992). Current nonpayment of child support may also raise future government costs through effects on the socioeconomic outcomes of children. Recent research has linked childhood in a poor, female headed family to low educational attainment, future single motherhood, and future welfare dependence (McLanahan, 1988; Krein and Beller, 1988).

Concern about these short-run and long-run implications of the widespread nonpayment of child support has led to government intervention in child support enforcement. The first major government policy initiative came in 1975 when Congress established the Child Support Enforcement (CSE) program under Title IV-D of the Social Security Act. This Act created the federal Office of Child Support Enforcement and required each state to establish a Child Support Enforcement agency to administer the program. By 1991, the CSE caseload was 13.4 million, and the program spent $1.8

billion to collect a total of $6.9 billion in child support (U.S. Department of Health and Human Services (DHHS), 1991).

The purpose of this paper is to assess the cost-effectiveness of expenditures on the government Child Support Enforcement program along two lines. First, I estimate the return to CSE expenditures in the form of increased CSE collections, which is the immediate goal of this government policy program. Next, I consider whether investment in CSE reduces expenditures on AFDC, the major U.S. welfare program for single mothers and their children. Lowering welfare costs is a second important goal of the CSE program. In my analysis, I use state level panel data on CSE and AFDC programs for the 1979-1991 period. To identify the parameters of interest, I exploit within-state over-time variation in CSE spending. This paper extends the previous literature by taking a state level approach to estimating the effects of CSE policy efforts on child support collections and AFDC costs and by directly linking these outcomes to expenditures on enforcement.

Estimates of the relationship between CSE spending and collections during the 1979-1991 period indicate that a 1% increase in CSE spending raises total CSE collections by .55% Evaluated at variable means, this translates to an increase of $1.93 in CSE collections per additional $1 spent. My results also suggest that state enforcement expenditures are much more effective at raising child support collections for non-AFDC families served by the CSE program than for families on AFDC. For the 1979-1991 period, an additional $1.00 of spending is associated with an increase of $2.96 in collections for the non-AFDC caseload compared to an increase of only about $0.11 for the AFDC caseload. In addition, I find evidence of variation in the effect of CSE expenditures on collections by the type of service provided and by CSE region. The second part of the empirical analysis provides evidence that state CSE expenditures are associated with lower AFDC costs but that the tradeoff is less than one-for-one. In the 1979-1991 period, increasing state CSE spending by $1.00 is estimated to decrease state

AFDC payments by $0.78.[1] The net effect of CSE on AFDC payments captured in this estimate is composed of effects on the size of the pool of women eligible for welfare (single mothers), AFDC participation among single mothers, and savings directly generated by the 100% tax rate on child support imposed by AFDC.[2] Direct estimates of this last component suggest that tax collections only account for approximately $.07 of the total $.78 reduction in AFDC costs.

2. Child Support Enforcement

Established in 1975, the government Child Support Enforcement (CSE) program is overseen by the federal Office of Child Support Enforcement, which is part of the U.S. Department of Health and Human Services. Actual enforcement services are provided by the state CSE agencies which administer the program in all fifty states, the District of Columbia (DC), Guam, Puerto Rico, and the Virgin Islands. In the analysis that follows, I restrict my attention to the fifty states and DC. The financing of the CSE program is shared by the federal and state governments with the federal government providing both direct cost sharing and financial incentives to the states based on state CSE program performance (U.S. DHHS, 1990).

State CSE agencies provide five major services to assist families in collecting child support. These are establishing paternity, locating absent parents, establishing child support orders, enforcing payment of existing child support obligations, and distributing collections. In 1991, approximately 34.5% of total CSE spending was allocated to enforcement of existing obligations. This was followed by spending on establishing child support orders, which accounted for 20% of the total. The state CSE agencies are

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[1] It should be noted that changes in AFDC costs may potentially understate total government savings. For example, women on AFDC are automatically eligible for Food Stamp benefits. (Medicaid costs used to be another government cost tied to AFDC receipt but recent policy changes have severed the link between these two programs.)

[2] In another paper (Nixon, 1995a), I consider the first two of these components of the overall effect using individual data from the 1988 and 1990 Current Population Surveys. I find evidence that CSE has statistically significant, negative effects on both the probability of becoming a single mother through divorce or separation and the likelihood of AFDC participation.

required by federal law to use a number of techniques to enforce payment of child support awards. These include wage withholding, regular billings, delinquency notices, property liens, offsetting State and Federal income taxes, and intercepting unemployment insurance payments (U.S. House of Representatives, 1992). A relatively new technique employed in several states, including Maine and Massachusetts, is to revoke driver's and professional licenses of parents delinquent in support payments. Key challenges facing the CSE system at present include the increasingly large number of children without paternity established, enforcing child support across state lines, and the lack of necessary automation and computerization for effective enforcement.

The services of the Child Support Enforcement program are available to any parent who lives with a child from an absent parent. Within the enforcement system, there are two main classes of cases: those who are referred to CSE by the AFDC program and, secondly, non-AFDC families who have applied for CSE assistance. As a condition for AFDC receipt, a mother must sign the child's support collection rights over to the state and the family automatically enters the CSE system. This requirement stems from the 100% tax rate on child support income imposed by the AFDC program which creates a disincentive for payment and reporting of child support. While a family is receiving AFDC benefits, child support is typically required to be paid directly to the state CSE or welfare agency rather than the mother. Until the mid-1980s, the government kept all child support payments made by fathers of AFDC families in accordance with the 100% AFDC tax rate. Under this policy, every dollar collected reduced government AFDC payments by one dollar, as long as the woman remained on AFDC. The policy changed with the Deficit Reduction Act of 1984 which instituted a $50 monthly "pass-through" in 1985. Since the implementation of this policy, the state has transferred up to $50 of the child support received from the father per month to the mother and taxed away any remaining amount at 100%. If a family exits AFDC, it is transferred to non-AFDC status in the CSE system and can continue to receive services. It is hoped that providing continued enforcement assistance will help to keep these families from re-entering the welfare system.

Non-AFDC families with children from an absent parent are also eligible for CSE

services and must simply contact the enforcement agency in their state order to obtain assistance. These families may be charged a nominal application fee of up to $25 (AFDC families face no such fee), but beyond that services are provided at no charge. In the early years of the enforcement program, non-AFDC families accounted for a small share of the caseload. As of 1980, 16% of the caseload was non-AFDC (U.S. DHHS, 1984). Large increases in non-AFDC participation occurred during the 1980s and by 1991 the caseload was 40% non-AFDC (U.S. DHHS, 1991). Deliberate attempts by the government to extend CSE services to non-AFDC families may account for much of this change. While CSE efforts towards non-AFDC families do not directly reduce AFDC costs, they may generate savings through "cost-avoidance," in other words, by preventing families from entering or re-entering the welfare system. In 1991, CSE spending on AFDC and non-AFDC cases closely paralleled their relative share of the caseload: 59% of spending went to AFDC cases and 41% to non-AFDC cases. However, child support collections from these two types of families served by the program showed the opposite pattern. CSE collections for AFDC families accounted for only 29% of total collections, while collections for non-AFDC families accounted for the remaining 71%. These statistics suggest a AFDC/non-AFDC difference in returns to CSE spending, which is explored in detail in the empirical analysis presented below.

There were two major efforts to reform and improve the CSE system during the 1980s. The 1984 Child Support Enforcement Amendments required states to institute a number of new enforcement tools and policies including wage withholding and state tax refund withholding of parents delinquent in child support and annual notification to AFDC recipients of the child support collected on their behalf. The Family Support Act, which followed in 1988, mandated that states use a number of additional enforcement tools including mathematical guidelines to set child support awards (such guidelines had been optional under the 1984 Amendments) and mandatory wage withholding for all cases in the CSE system by November 1990 and for all new child support awards regardless of whether the family applies for CSE services as of January 1994. This law also required states to initiate paternity establishment for all children up to age 18 and to meet paternity establishment quotas (U.S. House of Representatives, 1992).

3. Literature Review

A number of previous authors have considered the effects of CSE on child support collections and the effects of child support income on AFDC. To date, this line of research has focused primarily, if not exclusively, on micro data analysis. The current paper extends the existing literature by approaching these questions from a state level perspective. Another contribution I make is to address the costs of changing child support and AFDC outcomes through government policy efforts.

In the previous literature, the effect of CSE on child support collections has been approached from several angles. Robins (1986) estimates the effect of individually reported receipt of CSE services on child support payments using 1982 Current Population Survey (CPS) data. He finds that receiving help from CSE and the number of services received each have positive, significant effects on the dollar amount received. Using court records from twenty Wisconsin counties in the 1980-1986 period, Klawitter and Garfinkel (1992) estimate that the use of wage withholding increases child support payments by 11-30%. Three recent studies use CPS data to examine the effect of state child support laws and policies on individual child support receipts (Garfinkel and Robins, 1994; Beller and Graham, 1993; Miller, Garfinkel, and McLanahan, 1994). Overall, the results of these three studies are mixed and somewhat inconclusive. By directly considering the effect of state CSE expenditures on child support collections in the CSE system, the work presented here takes a new approach to examining the link between CSE and child support collections.

Research on the effect of child support on AFDC includes studies of effects on individual AFDC participation (Robins and Dickinson, 1985; Robins, 1984, 1986; Beller and Graham, 1993; Hu, 1993; Nixon, 1995a) and effects on welfare costs through reduced participation (Robins 1984, 1986; Oellerich, Garfinkel, and Robins, 1989; Garfinkel, Oellerich, and Robins, 1990).[3] In general, these studies have found small

[3] For example, Robins (1986) estimates that full enforcement of all existing obligations would reduce AFDC participation by only 1 percentage point (3%) and increase total child support collections as a percent of AFDC benefits by 9 percentage points (from 7% to 16%). Oellerich et. al. (1989) estimate that full enforcement of all existing obligations would reduce the number of families on AFDC by 4.8% and lower AFDC benefit payments by 3.5%.

effects of child support on AFDC participation and costs, though recent work by this author (Nixon, 1995a) suggests that the participation effects may be somewhat larger than previously thought.[4] The current study takes a broader approach to the question of CSE effects on AFDC by examining the net effect of CSE expenditures on AFDC spending at the state level.

4. Empirical Framework For Analysis

4.1 CSE Spending and CSE Collections

In the first part of my analysis, I consider the CSE program's success in achieving its goal of raising child support collections. In particular, I estimate the effect of CSE expenditures on CSE collections at the state level.[5] I assume that we can express the relationship between spending and collections as follows:

$$(1) \qquad C_{jt} = \beta_1 E_{jt} + Z_{jt}\delta_1 + \gamma_{1j} + \mu_{1t} + \epsilon_{1jt} .$$

In equation (1), j denotes state, t denotes year, C denotes the log of real total child support collections in the CSE system, E denotes the log of real CSE spending, and Z is a vector of state socioeconomic and demographic variables which are described below. The variables in Z are also in logs and, where applicable, in real dollars. The log specification assumes a constant elasticity between collections and expenditures, which is represented by β_1 in equation (1). I expect that CSE spending raises collections, i.e. $\beta_1 > 0$.

The vector of state effects, γ_{1j}, is included in the collections equation (1) to control for unobserved fixed state characteristics which may be correlated with the level

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[4] Robins (1984, 1986) and Beller and Graham (1993) estimate that a $1,000 increase in child support reduces the likelihood of AFDC by 4.4 percentage points and 4.6 percentage points respectively. Instrumenting for child support income with state CSE measures, Nixon (1995a) estimates that an additional $100 of child support reduces AFDC participation by approximately 1.7 percentage points.

[5] Spillover effects of CSE spending on collections outside the CSE system are not captured in this estimate.

of state CSE spending and the level of CSE collections. For example, states in which residents tend to place a high value on children might be expected to have both high CSE spending and high collections. In this example, estimates that did not include state fixed effects would over-state the true effect of CSE spending on child support collections. Once state effects are included, the remaining variation in the CSE spending variable is within-state over-time. A vector of time effects, μ_{1t}, is also included to control for year specific effects that may shift both E and C, such as the passage of federal child support legislation.

Even after controlling for state and time fixed effects, there may be time varying state characteristics which are correlated with CSE spending and collections. To address this, I include a vector of eight state/year specific variables (Z) which measure state economic and demographic conditions. The number of single parent families and three variables for the age distribution of the state population control for changes in the population eligible for CSE. I also include the percent of births to unmarried women to account for changes in both the eligible population and the proportion of "difficult" CSE cases. Collection for never-married women is expected to be more difficult because of the lack of any legal relationship between the parents and, in particular, lack of paternity establishment. The state unemployment rate and average hourly earnings in manufacturing are added to control for changes in fathers' ability to pay and the income needs of the single mothers. Finally, the AFDC maximum benefit for a family of four is included as a measure of changes in welfare generosity, which may have effects on welfare caseloads and, in turn, CSE caseloads and collections.

In my empirical analysis, I address several specific questions regarding the relationship between CSE spending and CSE collections. As a starting point, I simply estimate the effect of total CSE spending on total CSE collections during the 1979-1991 period. Next, I consider whether the relationship between collections and spending differs between the two types of families served by the CSE program, namely AFDC and non-AFDC. As we saw above, AFDC families account for approximately 40% of the CSE caseload and 40% of CSE spending, but only 29% of total CSE collections. To examine the question of AFDC/non-AFDC differences, I first estimate the effect of total CSE

spending on type-specific collections (AFDC, non-AFDC) for the entire period. I then estimate the effect of type-specific spending on type-specific collections for the 1986-1991 period, during which CSE expenditures are separately reported for the two segments of the caseload. Next, I consider how child support collections are affected by expenditures on different CSE services. Using 1986-1991 data which separately reports CSE spending for each of the five major services (paternity establishment, parent location, establishing orders, enforcing orders, distributing collections), I estimate a variation of equation (1) which includes five spending variables. As a final note on the collections-spending relationship, I examine whether this relationship differs across the ten CSE program regions.

4.2 CSE Spending and AFDC Costs

The second part of the analysis considers whether expenditures on CSE are effective at reducing AFDC costs, which is a stated goal of the enforcement program. This goal can be achieved through several channels. First, by enforcing payment of child support obligations for single mothers on AFDC, CSE spending can potentially lower welfare costs through the 100% tax on child support and through reduced AFDC participation. Second, by enforcing child support payments for non-AFDC families, CSE may be able to prevent these families from entering or re-entering the welfare system. Finally, increased CSE may lower welfare costs by reducing the rate of entry into the single mother population, which is the population categorically eligible to receive AFDC benefits (Nixon, 1995a).

In this paper, I assess the net effect of increased CSE expenditures on state welfare costs as measured by total AFDC payments. The equation I estimate simply expresses AFDC payments as a function of CSE spending and the vector of state economic and demographic characteristics described above. As in equation (1), state and year fixed effects are included to control for unobserved factors constant within states and in each given year, respectively. Assuming a linear functional form in the logs of the key variables, the AFDC payments equation can be written as follows:

$$(2) \qquad A_{jt} = \beta_2 E_{jt} + Z_{jt}\delta_2 + \gamma_{2j} + \mu_{2t} + \epsilon_{2jt} ,$$

where the notation remains as in equation (1) above, with the addition that A denotes the log of total state AFDC payments. The coefficient of interest is β_2, which represents the elasticity between CSE spending and AFDC spending. I expect that $\beta_2 < 0$, and I am particularly interested in determining whether CSE spending is a cost-effective way of reducing AFDC costs. In other words, for an additional $1 spent on CSE, do state AFDC payments decrease by more or less than $1?

In this part of the analysis, I also estimate the relationship between increased CSE spending and the government savings directly generated by the AFDC tax on child support income. These savings are mechanically related to child support collections for AFDC families. Prior to 1985, the government kept 100% of child support collections from the absent fathers of AFDC families. Since then, the amount retained by the government has been equal to total AFDC collections less "pass-through" payments to AFDC families due to the $50 monthly disregard. Fortunately, I am able to measure these tax collections by combining information on total AFDC collections in the CSE system with information on total "pass-through" payments. I then estimate an equation which relates these tax collections to CSE expenditures. This equation is a simple variation on equation (1), in which the dependent variable is now the log of child support tax collections (T_{jt}), rather than total child support collections (C_{jt}). More specifically the level of tax collections (t) is defined as: $t_{jt} = (c_{jt} - n_{jt} - p_{jt})$, where c denotes total collections, n denotes total non-AFDC collections, and p denotes "pass-through" payments. Assuming a linear functional form for the relationship between the log of tax collections and the log of CSE spending, we have the following equation:

$$(3) \qquad T_{jt} = \beta_3 E_{jt} + Z_{jt}\delta_3 + \gamma_{3j} + \mu_{3t} + \epsilon_{3jt} ,$$

where T_{jt} denotes the log of tax collections, and the other explanatory variables are identical to those in equations (1) and (2) above. In equation (3), I expect CSE spending to have a positive effect on child support tax collections, $\beta_3 > 0$, and I expect that $\beta_1 > \beta_3$,

since tax collections are a subset of total collections.

5. Data

The data used in this analysis consists of 663 observations covering the fifty states and the District of Columbia over the thirteen year period 1979-1991. There are three main parts to this data: Child Support Enforcement variables, AFDC program variables, and state socioeconomic and demographic variables. The source of the CSE data is the Office of Child Support Enforcement Annual Reports to Congress. These reports include detailed information on CSE program statistics including dollars spent on enforcement and dollars of child support collected by the enforcement program in each state. Information on state AFDC expenditures is taken from the yearly editions of the Social Security Bulletin Annual Statistical Supplement (1980-1993). More detailed information on the sources of these variables and the other state level variables used in the analysis are documented in a Data Appendix available from the author. Variable definitions are provided in Table 1 and variable means and standard deviations are presented in Table 2. The summary statistics in Table 2 show a considerable degree of variation in real CSE spending, CSE collections, and AFDC payments. On average, states annually spent $19 million on CSE, collected $67 million in child support, and paid out $332 million in AFDC benefits during the 1979-1991 period (all in real 1988 dollars).

Table 3 provides some additional summary statistics for the CSE system during the period under study. These figures indicate that real average CSE spending per case fell during the years 1979-1984 and rose steadily from 1987 to 1991, while real average CSE collections per case fell from 1979 to 1982 and rose steadily from 1982 to 1991. In each year, average AFDC collections per case were well below average non-AFDC collections per case. The data also shows a steady decline in non-AFDC average collections. This decline coincided with a steady increase in non-AFDC participation in the CSE program, which evidently lowered the average "quality" of the non-AFDC

families using the CSE system.[6] During the 1986-1991 period, CSE spending data is available for the AFDC and non-AFDC caseloads separately. In this period, average per case spending on the AFDC caseload exceeded that for the non-AFDC caseload by a factor of 1.9. In contrast, the ratio of average CSE collections per AFDC case to average CSE collections per non-AFDC case was only .67.

6. Empirical Analysis and Results

6.1 CSE Spending and CSE Collections: Total

The first part of the empirical analysis examines the effect of CSE spending on CSE collections. As noted above, four main specifications of the collections-spending equation are estimated to address different aspects of this relationship: (1) total collections and total spending, (2) collections and spending by AFDC/non-AFDC, (3) the return to CSE spending on different types of CSE services, and (4) the effects of CSE spending in different CSE program regions.

First, I simply estimate the collections equation (1) by Ordinary Least Squares (OLS) using total CSE collections as the dependent variable and total CSE spending as the explanatory variable of interest (both in logs). The results are presented in Column 1 of Table 4. I find that the elasticity between CSE collections and CSE spending is positive and statistically significant. In particular, a 1% increase in real CSE spending is estimated to increase total CSE collections by 0.55%. Evaluated at variable means, this translates to a $1.93 increase in collections per additional $1.00 spent on enforcement.

The only other state level explanatory variables which are found to have statistically significant effects on CSE collections are the unemployment rate and the age distribution variables. The unemployment rate has a positive effect on collections. Since I expect that increases in unemployment reduce fathers' ability to pay child support, this result appears puzzling at first. However, when unemployment increases, it is also likely that AFDC caseloads increase which automatically increases the CSE caseload. This

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[6] In particular, the absolute number of non-AFDC cases increased by 535% from 1980 to 1991 and the share of CSE participants that were non-AFDC increased from 16% to 40% over this period, as was noted above (U.S. DHHS, 1991 and 1984).

could increase total program collections even holding CSE spending fixed, if some of the cases enter the system with positive collections.

6.2 CSE Spending and CSE Collections: AFDC vs. Non-AFDC

To explore whether the return to CSE spending is the same for AFDC and non-AFDC cases in the CSE system, I estimate the relationship between collections and spending separately for these two segments of the total CSE caseload. For the entire sample period, there is only data on total CSE spending, but total CSE collections are broken down into AFDC collections and non-AFDC collections. Using this data, I re-estimate equation (1) first with AFDC collections as the dependent variable and then with non-AFDC collections as the dependent variable.[7] In both cases, the spending variable employed is total CSE expenditures. These results are presented in Columns 2 and 3 of Table 4. In the AFDC collections equation, I find an elasticity of .08 between CSE spending and collections. Evaluated at variable means, this translates to an increase of only about $0.11 in total AFDC child support collections when CSE spending increases by $1.00. In contrast, I find that CSE spending is quite effective at raising collections for the non-AFDC caseload. The estimated elasticity between CSE spending and non-AFDC child support collections is 1.3. At variable means, this elasticity implies that raising CSE spending by $1.00 increases non-AFDC collections by $2.96. This increase is approximately 27 times larger than the estimated increase for AFDC cases ($0.11).

Since both AFDC and non-AFDC families in the CSE system are able to receive the same enforcement services, the above finding suggests that there must either be differences in the allocation of an additional $1 of total CSE spending between AFDC and non-AFDC caseloads (such that non-AFDC cases get a larger share), and/or differences between the AFDC and non-AFDC cases in the fathers' ability to pay, fathers' willingness to pay, the type of services required, or the extent of services required. The fact that approximately 60% of total expenditures are devoted to the AFDC

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[7] For the full sample period, the available data on AFDC collections also includes collections for Foster Care (FC) families. However, recent data for 1990 which separates out AFDC and FC collections shows that AFDC collections make up 99.3% of total AFDC/FC collections.

caseload suggests that the first explanation listed above is unlikely. In terms of the degree and nature of assistance required, we might expect that child support collection tends to be a more lengthy and more difficult process for AFDC cases compared to non-AFDC cases. For example, relative to non-AFDC families, AFDC families are more likely to be headed by never-married women who face added barriers in obtaining support such as lack of paternity establishment.[8] In this case, even if a marginal $1 of CSE spending was split equally between the two types of cases, there could be a smaller increase in collections for the AFDC families due to the degree of assistance required to actually obtain payment. In addition, it may be the case that many fathers of AFDC children are poor, low-wage or unemployed workers (like their ex-partners who are now on AFDC), who do not have the ability to pay as much as fathers of non-AFDC families. Furthermore, there is a clear difference between these two groups in the incentive to pay child support due to the 100% AFDC tax rate on child support. As long as a father's children are receiving AFDC, the financial resources potentially available to the children are increased by at most $50 per month regardless of how much child support the father pays. Before the $50 pass-through was established, the children on AFDC experienced no increase in family income if the father paid child support.[9] In contrast, fathers of non-AFDC children increase the resources of their child(ren)'s family by $1 for each $1 they pay, since the payment goes directly to the family and is also untaxed by the federal income tax system (Beller and Graham, 1993).

To address whether the AFDC/non-AFDC difference arises from differences in the allocation of an additional dollar of total CSE spending, I turn to the 1986-1991 period for which I have separate information on CSE spending on AFDC cases and CSE spending on non-AFDC cases. With this information I can consider the effect of an additional $1 spent by CSE towards AFDC cases on the child support collections of

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[8] Data from the 1990 CPS Child Support Supplement indicate that 52% of single mothers on AFDC are never-married, while only 21% of single mothers not on AFDC are never-married.

[9] This assumes that the father of the children on AFDC pays child support through official channels and does not make any under-the-table payments. Any such payments clearly do not show up in the CSE collections data.

AFDC families, and likewise for non-AFDC. For reference, I first re-estimate equation (1) using total collections and total spending on the 1986-1991 period. The results, which are presented in Column 1 of Table 5, indicate an elasticity of .39 between total spending and total collections. This corresponds to a return of $1.43 per $1.00 spent.[10] Next, I separately estimate the effect of CSE spending for AFDC cases on total AFDC child support collections, and likewise for non-AFDC. For the AFDC caseload, the elasticity between AFDC collections and CSE spending on AFDC cases is positive (.041), but not statistically significant (Column 2, Table 5). At variable means, this elasticity estimate implies that CSE spending on the AFDC caseload raises collections for this group by $.08 per additional $1.00 spent. In the non-AFDC equation (Column 3, Table 5), the elasticity between non-AFDC CSE spending and non-AFDC collections is positive and statistically significant. Evaluated at variable means, the elasticity estimate of .35 implies that a marginal $1 of spending on the non-AFDC caseload raises collections by $2.34. The estimated increase in non-AFDC collections is approximately 29 times as large as the comparable increase in AFDC collections ($2.34 vs. $.08). These results confirm the idea that the AFDC/non-AFDC difference in returns is not driven by more of an additional spent going to non-AFDC cases, which was implied by the summary statistics.

To test the reliability of the breakdown of total CSE spending into AFDC and non-AFDC spending in the CSE data, I include both types of spending (AFDC and non-AFDC) in each of the two collections equations presented in Table 5. If reported spending by caseload type is an accurate reflection of spending on AFDC and non-AFDC families respectively, the coefficient on the non-AFDC CSE spending variable in the AFDC child support collections equation should be zero and likewise for the AFDC CSE spending variable in the non-AFDC collections equation. This hypothesis is supported in the data. In the AFDC collections equation (Column 2, Table 5), the estimated

[10] This result (as well as those for AFDC and non-AFDC groups) suggests that the return to CSE spending in terms of collections was lower in the 1986-1991 period than in the full 1979-1991 period. Since there were increasingly more reforms and improvements to CSE during the 1980s, it is unexpected that returns would decrease all else constant. Possible explanations for the lower return even in the presence of CSE improvements include a shift in the "quality" of CSE participants towards families with lower ability to pay and/or an increase in the proportion of "difficult" cases (e.g. more out-of-wedlock cases).

elasticity between non-AFDC CSE spending and AFDC collections is near zero (.02) and statistically insignificant. In the non-AFDC collections equation (Column 3, Table 5), CSE spending on AFDC cases has a slightly negative and again statistically insignificant effect on non-AFDC collections. These results provide suggestive evidence that reported CSE spending by AFDC/non-AFDC reflects actual spending on each type of case.

The above estimates of the CSE collections-spending equation consistently highlight the fact that spending by state CSE agencies has little effect on the child support collections of AFDC recipients. This finding suggests limited scope for CSE spending to reduce welfare rolls through the channel of increased child support collections for families currently on AFDC. In contrast, the above analysis demonstrates that CSE expenditures are effective at increasing child support collections for non-AFDC families. To the extent that non-AFDC families would end up on welfare (or back on welfare) without the child support collections they obtain through CSE efforts, CSE spending may prevent increases in welfare participation and costs which would occur in the absence of the CSE program.

I find that the estimated effects of the other state characteristics on CSE collections vary according to whether the dependent variable is AFDC collections or non-AFDC collections and also according to the sample period. For the 1986-1991 period, the elasticity between the number of single parent families and CSE collections is positive and significant in each collections equation and the largest (2.2) for AFDC collections. The percent of out-of-wedlock births has a statistically significant, negative effect on AFDC collections in both periods (1979-1991 and 1986-1991). This is not surprising since never-married mothers face additional barriers in obtaining support such as lack of paternity establishment. In contrast, the estimated effect of this variable on non-AFDC collections insignificant (and positive). If few of the non-AFDC single parents participating in CSE are never-married mothers, this could explain the AFDC/non-AFDC difference in the effect of this variable.

Average hourly earnings in manufacturing also have different effects on collections by caseload type. This variable enters negative and significant for AFDC collections and positive and significant for non-AFDC collections in the 1979-1991 period

estimates (Columns 2 and 3, Table 4). The idea that higher wages indicate higher ability to pay child support implies that this variable should have a positive effect. However, if state average wages are negatively related to AFDC caseloads (i.e. states with higher wages have higher income and fewer AFDC participants), then high wages imply that the AFDC pool from which child support is being collected is smaller. This could potentially explain the negative relationship observed between wages and AFDC child support collections. Consistent with the idea that higher unemployment reduces fathers' ability to pay, I find that unemployment has a negative effect on non-AFDC child support collections. However, this only holds in the 1986-1991 period, and I find a positive effect of unemployment on AFDC collections which is statistically significant for the 1979-1991 period. It is possible that total AFDC collections increase with the unemployment rate because unemployment increases AFDC caseloads and raises the average "quality" of women on AFDC (relative to low unemployment, when only the "worst" cases remain on AFDC). The effect of AFDC generosity on collections shows the same AFDC/non-AFDC pattern in sign as the unemployment variable, i.e. a positive effect on AFDC collections, and a negative effect on non-AFDC collections. If increases in AFDC benefits increase AFDC participation among single mothers, then the composition of the total CSE caseload is likely to shift towards AFDC cases (assuming a constant CSE participation rate of non-AFDC families). This could explain why total AFDC collections increase and total non-AFDC collections decrease when welfare generosity increases.

6.3 CSE Spending and CSE Collections: By CSE Service

As stated earlier, there are five major services are provided by state CSE agencies: paternity establishment, locating absent parents, establishing child support orders, enforcing existing obligations, and distributing collections. Beginning in 1986, expenditures on each of these types of services are available in the CSE program data. From 1986-1991, state CSE agencies spent the most on enforcement of obligations, which accounted for approximately 35% of total spending. At the other end, they spent the least on paternity establishment and parent location which accounted for 13% and 14% of the total respectively.

To examine the return to an additional dollar of spending on each type of service, I estimate the collections-spending equation (1) on the 1986-1991 period using these five spending categories in place of the total spending variable used above. The results of this estimation are presented in Table 6. I find that all spending types are positively associated with CSE collections. However, the effect of spending on "distribution" is not significantly different from zero. This latter result is not surprising since this CSE activity occurs after collections are made and is not aimed at raising collections. The elasticity between collections and CSE spending on locating absent parents is also not significantly different from zero. This could result from ineffective location efforts and/or failure to raise collections from those who are located.

CSE expenditures on paternity establishment, order establishment, and enforcement of orders each show statistically significant, positive effects on child support collections. Holding all else constant, a 1.0% increase in paternity spending is estimated to raise total collections by 0.043%. This effect seems minuscule. However, given that the absolute level of paternity spending is very small relative to collections, we find that spending an additional $1 on paternity raises collections by $1.33 (at variable means). Similarly, spending on order establishment has an elasticity of .059 and a marginal dollar return of $1.10 (at means), and spending on order enforcement has an elasticity of .064 and a marginal dollar return of $0.68. If the objective is to maximize collections, these results imply that relative to the existing allocation of CSE spending more should be spent on order establishment and paternity efforts and less on enforcement of existing orders, which is currently the highest spending category.

6.4 CSE Spending and CSE Collections: By CSE Region

As a final note on the collections-spending relationship, I consider whether the effect of CSE spending on collections varies across Child Support Enforcement program regions.[11] While the Enforcement system is primarily state based, there is some regional

[11] I also tested for variation in the effect of total CSE spending on total CSE collections across states according to: (a) state size (population) and (b) the state out-of-wedlock birth rate. These tests were done to address the hypothesis that collection per marginal $1 spent would be more difficult in states more likely

organization and coordination. In particular, states are divided into ten CSE regions, each with its own regional office. The regional office staffs work closely with states in their respective regions to improve enforcement by providing conferences, workshops, program and financial reviews, and on-site technical support, and by assisting member states with child support legislation, program management, public information, paternity establishment, and statistical reporting (U.S. DHHS, 1980).

To test for regional variation, I re-estimate equation (1) allowing the effect of CSE spending on collections to differ by CSE region. The results, which are presented in Table 7, do suggest the existence of regional differences in marginal returns to CSE spending. In three regions (I, II, and IX), the elasticity of collections with respect to spending is not significantly different from zero, while in the other seven regions the relationship is positive and statistically significant.

Computing derivatives for the regions with statistically significant elasticity estimates, I find that marginal returns to spending an additional $1 range from $1.28 (Region IV) to $4.54 (Region V). The region with the largest marginal dollar return (Region V) includes the state of Wisconsin which has been a leader and innovator in child support reform during this period. There is also evidence of considerable differences between average and marginal returns. For example, Regions III and V have high and comparable values for the ratio of average collections to average spending of approximately $5.25. However, the marginal return to spending in these two regions is quite different. In Region III, the marginal return to an additional $1 spent is $2.26, while in Region V, this return is approximately twice as large, at $4.54.

6.5 CSE Spending and AFDC Costs: Total

In this part of the empirical analysis, I consider the degree to which CSE spending succeeds in lowering AFDC costs. As noted earlier, there are a number of channels through which CSE spending may lower AFDC costs, including entry into single

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to have a high percent of out-of-state cases (small states) and in states with a high degree of many out-of-wedlock childbearing (due to the lack of paternity establishment). However, I found no evidence in the data of variation in the effect of total CSE spending on total CSE collections along these margins.

motherhood, effects on participation among single mothers, and the AFDC tax on child support. By estimating the relationship between total AFDC payments and total CSE spending, I attempt to measure the net effect of CSE spending on AFDC costs. Estimates of the AFDC payments equation (2) for the full 1979-1991 period are presented in the first column of Table 8. The elasticity between state expenditures on CSE and AFDC is negative and statistically significant (at 5%), providing empirical support for the hypothesis that CSE spending lowers AFDC costs.

This result implies that CSE spending does have a potential role to play in policy efforts aimed at cutting welfare costs. In order to determine the appropriate level of emphasis to be given to CSE spending within a multi-faceted welfare reform package, it is useful to know the magnitude of the effect of CSE spending on AFDC costs. The results of this analysis indicate that a 1.0% increase in state CSE spending reduces state AFDC payments by 0.05%. Evaluated at variable means, this translates to a $0.78 decrease in AFDC payments for an additional $1.00 spent on CSE. Increased government expenditures on CSE alone do not appear to be a cost-effective way to reduce AFDC expenditures.

The estimates of the effects of the other state variables in the AFDC payments equation are generally consistent with prior expectations. The unemployment rate has a significant, positive effect on total AFDC payments, while wages have a significant, negative effect. Since more single mothers are apt to receive AFDC benefits when economic conditions deteriorate, the signs on these variables are in the expected direction. Increases in AFDC maximum benefit levels have a significant, positive effect on total AFDC payments. This result is clearly expected since higher maximum benefits imply higher total payments even holding the caseload constant. In addition, increases in maximum benefits may increase the AFDC caseload, which would further increase total payments. Finally, I find that increases in the AFDC eligible population (single parent families) are associated with increases in AFDC total payments.[12]

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[12] It is possible that the effectiveness of CSE spending at lowering AFDC costs varies according to the levels of some of these other state characteristics. This is something I plan to address in future versions of this work.

6.6 CSE Spending and AFDC Costs: Tax Collections

The final part of the analysis considers the AFDC savings generated by the 100% AFDC tax rate on child support. Estimates of the AFDC tax collections equation (3) are presented in Table 8. For the 1979-1991 period (Column 2), I find that the elasticity of AFDC child support tax collections with respect to CSE spending is .06. Evaluated at variable means, this translates to AFDC savings due to the child support tax of $.07 per additional $1 of CSE spending. As expected, the estimated effect of CSE spending on AFDC child support tax collections is smaller than the comparable estimate of the effect of CSE spending on total child support payments for AFDC families ($.11).

Since 1985, states have been required to "pass-through" the first $50 of child support received per month to the family on AFDC, and the 100% tax sets in above this amount. This suggests that given a constant relationship between CSE spending and child support collections for AFDC families during the 1979-1991 period, there would be lower marginal tax collections after 1985. I test for a change in the relationship between CSE spending and AFDC child support tax collections when the "pass-through" policy is implemented by allowing for the effect of CSE spending to differ in the two periods (pre-pass-through and post-pass-through). This is simply done by interacting CSE spending with two dummy variables, the first equal to 1 in years before the policy was in place, and the second equal to 1 in the years after the policy took effect.[13]

The results of this estimation (Column 3, Table 8) suggest that there was in fact a change. In the pre-pass-through period, an additional dollar of CSE spending is estimated to generate $0.08 in AFDC child support tax collections, while in the post-pass-through period the comparable estimate is $0.03. While the elasticity estimates for these variables are not significantly different from zero, they are significantly different from each other in the expected direction, i.e. lower in the post-pass-through period. Finally, I estimate equation (3) during the period (1986-1991) for which there is data for CSE spending on the AFDC caseload. These estimates (Column 3, Table 5) indicate an

[13] Although the policy went into effect in 1985, I can only start measuring pass-through payments in 1986 since the Office of Child Support Enforcement did not begin reporting them until that year.

elasticity of .043 between CSE spending on AFDC cases and tax collection savings, which corresponds to $0.07 in savings per additional dollar spent on CSE. However, this estimate is not statistically significant.

These results suggest that the welfare program savings generated by the AFDC tax on child support income are small and account for only about 9% of the total $0.78 reduction in AFDC payments associated with a $1 increase in CSE spending. Since AFDC child support tax collections are a simply a portion of total AFDC caseload collections for AFDC families, this finding is not at all surprising given the relatively small ($0.11) increase in AFDC collections associated with a $1 increase in CSE spending. The sign and significance pattern of the coefficients on the other explanatory variables in the tax collections equation is similar to the AFDC child support collections equation discussed above, which has a closely related dependent variable.

7. Conclusions

This work evaluates the effectiveness of government expenditures on Child Support Enforcement (CSE) during the 1979-1991 period in terms of raising child support collections and, secondly, reducing welfare costs. These outcomes correspond to two primary goals of the CSE program. My results suggest that increasing CSE spending by $1 raises collections by nearly $2. However, I find relatively large differences in the returns to spending for the AFDC and non-AFDC caseloads served by CSE. In particular, the return for non-AFDC families is nearly $3 in increased collections compared to only about $.10 for AFDC families. I also find differences in the effects of CSE spending according to the type of service being provided and according to geographic region. The results for welfare savings suggest that expenditures on CSE lower AFDC costs by $0.78 per additional $1 spent. Government spending on CSE alone does not appear to be a cost-effective way to cut welfare costs.

The results obtained here provide several policy recommendations for the current efforts to "end welfare as we know it." First, any increased expenditure on the CSE program as it stands today should be accompanied by innovative reforms to the system. President Clinton's recent proposal to improve interstate CSE coordination and collection

efforts by establishing a national computer network to track all child support cases would provide one step in this direction. Second, the low return to CSE spending on the AFDC caseload in terms of increased child support collections suggests the need for additional research and policy attention to be given to this group. Determining the underlying reason for this result would provide valuable information to policy makers trying to raise collections for AFDC families. For instance, if the problem is lack of awards, policies such as paternity identification programs in hospitals at the time of birth would be warranted. On the other hand, if the problem stems from fathers' inability to pay or disincentives created by the 100% AFDC tax on child support, different policy recommendations would follow.

Finally, a natural question raised by these results is whether there are other reasons to invest taxpayer dollars in CSE, even if it is not a cost-effective way to lower welfare costs. While concern over rising welfare costs was one factor which led to the establishment of the CSE program, a basic concern for the well-being of children who live with only one of their parents also played a key role (U.S. DHHS, 1990). CSE has the potential to benefit these children in several ways. First, it can raise the financial resources available to children in single parent families. This should have positive effects on children's socioeconomic outcomes, as long as increased child support income is not offset by equal decreases in other income sources and at least some of the increased income is allocated to the children in the family. Recent research by Beller and Graham (1993), Graham, Beller, and Hernandez (1994), Baydar and Brooks-Gunn (1994), and Knox and Bane (1994) provides empirical evidence of beneficial impacts of child support on educational outcomes of children. Increased CSE efforts also have the potential to increase child-parent contact, which could have subsequent positive effects on child development. Veum (1992) suggests that child support payments and father visitation are positively associated and increased child support could also potentially allow the mother to substitute labor market hours for time with her children (Graham and Beller, 1989; Hu, 1993).

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Table 1 - Variable Definitions

Variable Name	Variable Definition
Outcome measures	
Collections: total	total child support collections by CSE
Collections: AFDC	AFDC caseload child support collections by CSE
Collections: Non-AFDC	non-AFDC caseload child support collections by CSE
AFDC program payments	total benefit payments to AFDC program recipients
AFDC tax collections	AFDC caseload child support collections kept by state due to AFDC tax on child support income
Expenditure variables	
CSE spend: total	CSE total expenditures
CSE spend: AFDC	CSE expenditures on AFDC caseload
CSE spend: non-AFDC	CSE expenditures on non-AFDC caseload
CSE spend: paternity	CSE expenditures on paternity establishment
CSE spend: location	CSE expenditures on absent parent location
CSE spend: orders	CSE expenditures on establishing child support orders
CSE spend: enforce	CSE expenditures on enforcing payment of existing orders
CSE spend: distribution	CSE expenditures on distributing collections made
State characteristics	
single parents	number of single parent families with children < 18
out-wed birth rate	100*(births to unmarried women)/(total births)
unemp rate	unemployment rate
avg wage	average hourly earnings in manufacturing ($1s)
AFDC benefit	maximum annual AFDC benefit for a family of four
pop < 18	(population 0-17 years)/(total population)
pop1844	(population 18-44 years)/(total population)
pop4564	(population 45-64 years)/(total population)

Table 2 - Variable Means and Standard Deviations

Variable Name	Variable Mean	Standard Deviation
Outcome measures (real 1988 $1000s)		
Collections: total	67263.63	109383.60
Collections: AFDC	24216.33	34559.70
Collections: non-AFDC	43047.30	80586.15
AFDC program payments	332382.00	634339.70
AFDC tax collections	21845.93	31373.87
Expenditure vars (real 1988 $1000s)		
CSE spend: total	19268.67	27970.82
CSE spend: AFDC*	15388.80	20781.16
CSE spend: non-AFDC*	9338.88	11807.04
CSE spend: paternity**	3015.25	4005.84
CSE spend: location**	3671.69	6453.08
CSE spend: orders**	4982.64	6961.80
CSE spend: enforce**	8822.46	12450.58
CSE spend: distribution**	4457.62	6325.71
State characteristics		
single parents (1000s)	129.95	148.21
out-wed birth rate	21.55	8.26
unemp rate	6.79	2.27
avg wage (real 1988 $1s)	10.22	1.43
AFDC benefit (real 1988 $1000s)	5.68	1.94
pop < 18	.27	.03
pop1844	.39	.09
pop4564	.22	.09

Notes:
*These variables are only available for 1986-1991. The number of observations is 306.
** These variables are only available for 1986-1991 and there are 7 missing values. The number of observations is 299.

Table 3 - CSE Program Statistics for the 1979-1991 Period

Year:	Spending Per Case (real 1988 $1s)			Collections Per Case (real 1988 $1s)		
	Total	AFDC*	non-AFDC*	Total	AFDC	non-AFDC
All	123.86	176.78	92.43	376.48	278.80	1131.69
1979	145.48			458.19	276.60	3874.91
1980	147.33			391.09	268.42	3233.85
1981	131.86			341.22	202.60	1419.75
1982	116.73			311.99	198.46	899.34
1983	119.04			317.87	205.41	838.56
1984	113.53			325.86	211.68	811.56
1985	113.79			337.25	223.63	795.76
1986	116.25	170.48	96.63	355.82	311.75	517.06
1987	112.54	160.26	92.97	377.26	313.37	523.83
1988	115.22	172.02	85.68	399.51	338.06	511.47
1989	121.80	182.17	90.60	415.84	350.84	509.50
1990	125.63	185.18	89.75	420.16	363.22	496.84
1991	130.92	190.11	99.14	442.16	360.33	523.35

Notes:
The number of observations is 663, except where otherwise noted.
*These variables are only available for the 1986-1991 period. The number of observations is 306.

Table 4 - The Effect of Child Support Enforcement Spending on Collections 1979-1991

Explanatory variables:	Dependent Variable: ln(Collections)		
	Total (1)	AFDC (2)	Non-AFDC (3)
ln(CSE spend:total)	.552 (.052) {1.928}	.083 (.047) {0.105}	1.325 (.168) {2.961}
ln(single parents)	.353 (.264)	1.580 (.236)	-.362 (.847)
ln(out-wed birth rate)	.012 (.178)	-.764 (.159)	.677 (.569)
ln(unemp rate)	.212 (.067)	.216 (.060)	.179 (.214)
ln(avg wage)	-.162 (.309)	-1.030 (.276)	1.883 (.991)
ln(AFDC benefit)	-.007 (.083)	.286 (.074)	-.898 (.265)
ln(pop < 18)	1.941 (.690)	.215 (.616)	2.069 (2.209)
ln(pop1844)	2.894 (.746)	1.354 (.667)	5.941 (2.391)
ln(pop4564)	2.463 (.602)	1.633 (.538)	4.730 (1.928)
Constant	12.038 (2.521)	10.352 (2.252)	9.641 (8.077)
Year Fixed Effects	yes	yes	yes
State Fixed Effects	yes	yes	yes
Adjusted R-squared	.966	.967	.826
Observations	663	663	663

Notes:
Standard errors in parentheses ( ). For CSE spending variables the derivative of collections with respect to spending evaluated at means is in brackets {}.
All dollar valued variables are in real 1988 dollars.

Table 5 - The Effect of Child Support Enforcement Spending on Collections 1986-1991

Explanatory variables:	Dependent Variable: ln(Collections)		
	Total (1)	AFDC (2)	Non-AFDC (3)
ln(CSE spend:total)	.386 (.050) {1.433}	...	...
ln(CSE spend:AFDC)	...	.041 (.032) {.079}	-.080 (.058) {-.326}
ln(CSE spend:non-AFDC)	...	.020 (.017) {.064}	.349 (.031) {2.341}
ln(single parents)	.846 (.413)	2.210 (.386)	1.483 (.706)
ln(out-wed birth rate)	-.194 (.150)	-.529 (.143)	.218 (.262)
ln(unemp rate)	-.238 (.048)	.026 (.046)	-.251 (.084)
ln(avg wages)	.591 (.351)	-.071 (.336)	.527 (.614)
ln(AFDC benefit)	-.069 (.063)	.246 (.061)	-.177 (.111)
ln(pop < 18)	-1.908 (.498)	-1.369 (.476)	-3.243 (.869)
ln(pop1844)	-.342 (.496)	-.095 (.486)	.671 (.888)
ln(pop4564)	-.260 (.420)	.217 (.410)	.258 (.749)
Constant	.065 (2.286)	1.472 (2.205)	-1.290 (4.028)
Year Fixed Effects	yes	yes	yes
State Fixed Effects	yes	yes	yes
Adjusted R-squared	.992	.992	.985
Observations	306	306	306

Notes:
Standard errors in parentheses ( ). For CSE spending variables the derivative of collections with respect to spending evaluated at means is in brackets {}.
All dollar valued variables are in real 1988 dollars.

Table 6 - The Effect of CSE Spending on Collections 1986-1991, by Type of Spending

Spending Category	(1)* Mean [$spend_T$]/ [total]	(2) Elasticity: Coefficient (Std Err)	(3)* [avg coll]/ [avg $spend_T$]	(4) Derivative: (2)eval.@(3)
Paternity	.130	.043 (.019)	30.908	1.33
Location	.137	.011 (.016)	25.982	~0
Orders	.191	.059 (.018)	18.704	1.10
Enforce	.350	.064 (.018)	10.563	.68
Distribution	.192	.018 (.019)	20.907	~0
F-test: spending variables [Prob > F]	...	7.94 [.0000]	...	...

Notes:

*($spend_T$) refers to CSE spending of type T where T=[paternity, location, orders, enforce, distribution]; (avg coll) denotes average CSE collections and (avg $spend_T$) denotes average spending of type T.

The regression equation producing the estimates in column (2) has ln(Collections) as the dependent variable and includes the five spending variables (in "ln" form) plus the full set of state characteristics, state fixed effects, and year effects, as in the basic collections equation presented in Table 4. All dollar valued variables are in real 1988 dollars.

The number of observations is 299 and the adjusted R-squared of the regression is .991.

Table 7 - The Effect of CSE Spending on Collections by CSE Region 1979-1991

CSE Region	Member States	(1) Elasticity: Coefficient (Std Err)	(2)* (avg collect)/ (avg $spend_R$)	(3) Derivative: (1)eval.@(2)
I	CT, ME, MA, NH, RI, VT	.100 (.092)	3.48	~ 0
II	NY, NJ	-.434 (.247)	2.83	~ 0
III	DE, MD, PA, VA, WV, DC	.431 (.079)	5.23	2.26
IV	AL, FL, GA, KY, MS, NC, SC, TN	.500 (.059)	2.56	1.28
V	IL, IN, MI, MN, OH, WI	.861 (.097)	5.28	4.54
VI	AR, LA, NM, OK, TX	.667 (.111)	2.01	1.35
VII	IA, KS, MO, NE	.779 (.092)	3.87	3.02
VIII	CO, MN, ND, SD, UT, WY	.559 (.097)	2.39	1.34
IX	AZ, CA, HI, NV	-.124 (.115)	2.40	~ 0
X	AK, ID, OR, WA	.499 (.117)	3.54	1.77

Notes:

*($spend_R$) refers to CSE spending in region R where R=I-X; (avg collect) denotes average CSE collections and (avg $spend_R$) denotes average spending in region R.

The regression equation producing the estimates in column (1) has ln(Collections) as the dependent variable and includes the full set of state characteristics, state fixed effects, and year fixed effects, as in the basic collections equation presented in Table 4. All dollar valued variables are in real 1988 dollars.

Table 8 - The Effect of Child Support Enforcement Spending on AFDC Costs 1979-1991

	ln(AFDC payments)	ln(AFDC tax collections)		
	1979-1991 (1)	1979-91 (2)	1979-91 (3)	1986-91 (4)
ln(CSE spend:total)	-.045 (.023) {-.781}	.063 (.047) {.072}	...	...
ln(CSE spend:total) x(year≤85)**	...	...	.065 (.047) {.088}	...
ln(CSE spend:total) x(year>85)**	...	...	.027 (.050) {.026}	...
ln(CSE spend:AFDC)	...	...	...	.043 (.035) {.068}
ln(single parents)	1.592 (.118)	1.653 (.238)	1.597 (.239)	2.267 (.426)
ln(out-wed birth rate)	-.068 (.079)	-.725 (.160)	-.810 (.164)	-.566 (.159)
ln(unemp rate)	.237 (.030)	.203 (.060)	.192 (.060)	.019 (.051)
ln(avg wage)	-.348 (.138)	-1.045 (.279)	-1.057 (.278)	.091 (.370)
ln(AFDC benefit)	.386 (.037)	.221 (.075)	.229 (.074)	.287 (.067)
ln(pop<18)	-.992 (.307)	.308 (.622)	.458 (.623)	-1.451 (.526)
ln(pop1844)	-1.051 (.332)	1.191 (.673)	1.333 (.674)	.025 (.535)
ln(pop4564)	-.818 (.268)	1.588 (.543)	1.661 (.542)	.303 (.452)
Constant	2.727 (1.200)	10.203 (2.273)	10.978 (2.292)	1.107 (2.440)
Year Fixed Effects	yes	yes	yes	yes
State Fixed Effects	yes	yes	yes	yes
Adjusted R-squared	.992	.965	.965	.990
Observations	663	663	663	306

Notes:
** (year≤85)=1 if year is 79-85, 0 otherwise; (year>85)=1 if year is 86-91, 0 otherwise.
Standard errors in parentheses (). For CSE spending variables the derivative of collections with respect to spending evaluated at means is in brackets {}. All dollar valued variables are in real 1988 dollars.

CHAPTER 2

Child Support Enforcement, Marital Dissolution, and Welfare Participation

1. Introduction

In 1992, the poverty rate of children under the age of 18 living in female headed households with no spouse present was 56%, compared to only 11% for children living in married couple households (U.S. Bureau of the Census, 1993a). At the same time, a large and increasing number of children in the United States live in families headed by single mothers. By 1990, nearly 1 out of 4 children under the age of 18 lived with a single mother, compared to only 1 out of 10 children in 1970 (U.S. Bureau of the Census, 1991). In the mid-1980s it was estimated that at least 1 out of 2 children in the current generation would spend a part of their childhood in a single parent family (Bumpass, 1984). These trends in family structure and childhood poverty are important public policy concerns for several reasons. First, childhood in a poor, female headed family has been associated with a number of negative socioeconomic outcomes for children. These include low educational attainment, future labor market difficulties, teen pregnancy, and future welfare dependence (Beller and Graham, 1993; Krein and Beller, 1988; McLanahan, 1988; McLanahan, 1985; Shaw, 1982). Second, these trends have important implications for government costs. In the short-run, costs are increased as low-income, single mother families often turn to government programs such as Aid to Families with Dependent Children (AFDC) for financial assistance. In 1989, the AFDC participation rate among single mothers with incomes below the median single mother income was 53%.[1] Current poverty in these families may also raise long-run government costs through its effects on child outcomes.

The failure of absent fathers to pay child support has been recognized by policy makers as a key factor contributing to the high rates of poverty and welfare dependence in single mother families. Nonpayment of child support currently affects a large share of the single mother family population in the United States. In 1989, only 37% of single mothers with children from an absent father received any child support payments. Even among single mothers with a child support award established (58% of those eligible for support), only 65% received any payments and only 44% received the full amount owed

[1] Author's tabulations based on the 1990 Current Population Survey Child Support Supplement.

(U.S. House of Representatives, 1992).

Given the negative effects associated with nonpayment combined with a general belief that fathers are able to pay considerably more child support than they currently pay,[2] Child Support Enforcement (CSE) has emerged as an important tool in public policy efforts to reduce childhood poverty and welfare costs. The U.S. government's CSE program was enacted by Congress in 1975 under Title IV-D of the Social Security Act. This law created the federal Office of Child Support Enforcement and required each state to establish a CSE agency to administer the program. In 1992, the CSE program's total caseload was 15.2 million, and $1.99 billion was spent to collect $7.96 billion of child support (U.S. Department of Health and Human Services (DHHS), 1992).

While economists have begun to examine the effects of Child Support Enforcement policy efforts, there are a number of interesting questions which remain unanswered or unresolved. The purpose of this paper is to offer new insight into the effects of CSE on two particular outcomes: (1) marital dissolution, and (2) AFDC participation. These two issues correspond nicely to the Child Support Enforcement program's stated mission, which is "to strengthen families and to reduce welfare dependency, by ensuring that parents live up to the responsibility of supporting their children" (U.S. DHHS, 1990). My aim in this paper is to assess whether this particular government policy is having its intended effects.

The first question I examine is the impact of Child Support Enforcement on the probability of becoming a single mother through marital dissolution. In this analysis, both divorce and separation are considered because the single mother is eligible for child support in either case. In addition to directly addressing the CSE program's first goal, this part of my analysis indirectly addresses the second goal by examining entry into the

[2] Two recent studies (Garfinkel and Oellerich, 1989; Miller, Garfinkel, and McLanahan, 1993) estimate that in the aggregate absent fathers have the ability to pay 4-5 times more than they actually pay. These results are both based on applying the state of Wisconsin's child support guidelines to estimates of non-custodial fathers' incomes to obtain estimates of fathers' ability to pay.

pool of women categorically eligible for welfare, i.e. single mothers.[3] In general, the divorce transition is important to consider because it is associated with a precipitous drop in family income for women and children in the single mother families which result (Duncan and Hoffman, 1985). By raising the financial obligation of the absent father to the single mother family in the divorced/separated state,[4] Child Support Enforcement has two important effects. First, CSE increases the income available to the mother in the divorced state.[5] All else equal, this raises the mother's incentive to divorce by lowering the costs associated with this decision. If this was the only effect, we would expect CSE to encourage divorce. However, CSE clearly has an opposing effect on the father which raises his cost of divorce. Given that these two opposing effects are operating, the net effect of CSE on divorce is a particularly interesting empirical issue. To examine this question, I use a sample of women with dependent children from the 1988 and 1990 Current Population Surveys (CPS). Using cross-sectional variation in state CSE strength to identify the effect, I find that CSE has a significant, negative effect on the probability of recently becoming a divorced or separated single mother. In contrast, estimates of the effect of CSE on divorce in a control group of women ineligible for child support are near zero and statistically insignificant. This latter result suggests that the estimates obtained for the child support eligible sample truly reflect the effect of CSE on divorce rather than effects of unobserved state characteristics.

The second question I address in this paper is the effect of CSE on AFDC

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[3] In addition to marital dissolution, entry into single motherhood can also occur through a second route: out-of-wedlock childbearing. While out-of-wedlock childbearing is not the subject of this paper, potential effects of CSE on this decision deserve future research attention. In my own preliminary work on this question, I have found that CSE variables have negative but statistically insignificant effects on the probability of being a never-married mother.

[4] Throughout the paper I assume that upon divorce/separation the mother becomes the custodial parent and the father becomes the absent parent. In 1990, 87% of children living with one parent lived with their mothers (U.S. Bureau of the Census, 1992).

[5] From this point forward the terms "divorce" and "marital dissolution" will refer to separation and divorce, both of which lead to eligibility for child support.

participation.[6] This directly corresponds to the CSE program's goal of reducing welfare dependency. Child Support Enforcement is expected to reduce participation in AFDC for two reasons. First, increases in child support income reduce the likelihood the single mother family is eligible for AFDC, which is a means-tested program. Second, because child support income is taxed at 100% by the AFDC program (above a $50 monthly disregard), increases in child support payments made by absent fathers only translate to equal increases in income received by single mothers families that are not on welfare. This clearly creates incentives not to participate in AFDC. In my empirical analysis, I examine a sample of single mothers from the 1988 and 1990 CPS Child Support Supplements. Direct estimates of the effect of government CSE variables on AFDC participation indicate that CSE reduces the probability of AFDC participation, particularly among recently divorced and never-married single mothers. To quantify the effect of child support on AFDC, I estimate the relationship between actual child support income and the probability of AFDC participation using cross-state variation in CSE to purge reported child support income of measurement error and unobserved heterogeneity. The results suggest that a $100 increase in annual child support income (10.6% of the average amount received), would reduce the AFDC participation rate of single mothers from 30.9% to approximately 29.2%. This is a decline of 5.5% from the original level.

2. The Child Support Enforcement Program

Established in 1975, the U.S. government's Child Support Enforcement (CSE) program is a joint federal-state effort aimed at securing the payment of child support. While the federal government shares in the financing of CSE and oversees the administration of the program, the primary provision of services occurs through state CSE agencies. The state enforcement agencies provide five major services to single parent families: establishing paternity, locating absent parents, establishing child support obligations, enforcing existing obligations, and distributing collections. In 1992, CSE

[6] Clearly this is only one aspect of the total effect of CSE on AFDC. In another paper, Nixon (1995a), I estimate the net effect of CSE on AFDC using state level panel data on CSE expenditures and AFDC payments.

efforts to enforcement payment of existing obligations accounted for 36% of total CSE spending; this was the largest spending category (U.S. DHHS, 1992). To enforce payment, the CSE agencies rely on a number of different techniques including wage withholding, regular billings, delinquency notices, property liens, and intercepting unemployment insurance benefit payments and tax refunds.

Assistance from the CSE program is available to all single parent families in the United States. Families on welfare (AFDC) are referred directly to their state's CSE agency and are required to participate as a condition for receiving welfare, while families outside the welfare system participate in the CSE program by choice. The cost of services is zero for AFDC families and, at most, a $25 application fee for non-AFDC families. As of 1992, the CSE caseload was 43% non-AFDC and 57% AFDC.[7] Increasing child support collections for AFDC families generates direct savings for the government because child support is taxed at 100% by AFDC (above a $50 monthly disregard instituted in 1985) and because increased child support may enable a woman to leave the welfare rolls. CSE efforts to increase child support payments made to non-AFDC single mother families can indirectly generate government savings through cost-avoidance, i.e. preventing families from entering or re-entering the welfare system.

3. Literature Review

This paper extends the existing economic literature on both divorce and child support by directly examining the link between the two for the first time. The seminal works by Becker, Landes and Michael (1977) and Becker (1981) on the economics of divorce and family structure serve as a theoretical foundation for this work, as well as most economic studies of divorce and family structure completed since that time,

[7] During the 1980s, CSE participation among the non-AFDC population of single parents increased dramatically. Between 1980 and 1992, the absolute number of non-AFDC CSE cases increased by a factor of 7.6 (compared to 1.9 for AFDC CSE cases), and the share of CSE participants that were non-AFDC rose from 15.6% to 42.6% (U.S. DHHS, 1992 and 1984). By 1989, approximately 27% of non-AFDC single mothers reported having had contact with a CSE agency at some time (author's tabulations from 1990 CPS). Legislation passed by Congress in 1984 required states to publicize CSE services and extend more services to non-AFDC clients; this may account for some of the increase in non-AFDC participation in CSE.

including Weiss and Willis (1985), Peters (1986), Moffitt (1990), and Peters (1993). There is a relatively large literature which examines the effects of the U.S. welfare system on family structure, including divorce and, more generally, female headship (see Moffitt (1992) for a thorough review). Increases in welfare generosity are expected to increase the probability of becoming a divorced mother. This prediction follows directly from the fact that an increase in the level of welfare benefits improves the mother's opportunities in the divorced state, while it has no direct effect on the father since the government is providing the increased income to the mother. However, as pointed out by Moffitt (1992), an increase in CSE raises the financial transfer from the absent father to the single mother in the divorced state, and therefore has effects on both parents which are in opposing directions. Therefore, in the case of CSE, the expected direction of the net effect on divorce is ambiguous.

The economic literature devoted to questions concerning child support and family structure is just beginning to emerge. Two recent studies (Hu, 1993; Beller and Graham, 1993) have considered the effect of child support payments on the probability of remarriage among divorced and separated women. Since increased child support both reduces the divorced mother's gain to remarriage and at the same time makes her a more attractive marriage partner (since the father's child support obligation continues if the mother remarries), this is another case in which the theoretical effect of CSE is ambiguous. These studies both conclude that child support has no systematic or significant effect on remarriage. The present study is, to my knowledge, the first to consider the effect of child support on divorce.

Several previous authors have examined the relationship between child support income and AFDC participation of single mothers (Robins 1984, 1986; Beller and Graham, 1993; Hu, 1993). These authors generally find small, negative effects of child support income on AFDC.[8] There are also three recent studies which separately address

[8] For a $1000 increase in annual child support income, Robins (1984) estimates that the AFDC participation rate of single mothers would fall by 4.4 percentage points, Beller and Graham (1993) estimate a 4.6 percentage point reduction, and Hu (1993) estimates a 1.1 percentage point reduction (in the first year following divorce). The latter two studies examine divorced and separated women only.

the relationship between states' CSE policies and individual child support income (Garfinkel and Robins, 1994; Beller and Graham, 1993; Miller, Garfinkel, and McLanahan, 1994). To examine the effect of CSE, these authors focus on state laws affecting child support (such as wage withholding, paternity establishment regulations, and award guidelines) as measures of CSE. Overall, the evidence from these studies regarding the effects of enforcement is mixed.[9] In this paper, I connect these two strands of literature in an integrated analysis of CSE, child support income, and AFDC participation. The specific contributions of my AFDC analysis are: (1) to employ a new set of Child Support Enforcement variables based on state CSE program performance, (2) to provide direct estimates of the effect of government Child Support Enforcement on AFDC by estimating a reduced form version of the AFDC participation equation, and (3) to improve on past estimates of the effect of individual child support income on AFDC participation by using cross-state variation in CSE strength to identify the effect of child support. Previous studies either have not attempted to address the potential biases induced by measurement error and unobserved heterogeneity in child support income or have been confined to using observed individual characteristics (such as the number of children or the length of the marriage) as instruments for child support.[10]

4. Theoretical and Empirical Framework

4.1 Divorce: Theoretical Framework

In this section of the paper, I examine the theoretical effects of Child Support Enforcement on divorce. The model of divorce which I consider here closely follows the

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[9] In particular, Garfinkel and Robins (1993) consider 16 policies and find 6 have at least marginally significant effects in the expected direction. Beller and Graham (1993) present results for 7 enforcement policies and find 3 to be associated with increased payments over their period of study. Miller et. al. (1994) examine 13 policies and find a mixture of positive effects and perverse effects of individual policy measures on child support payments; it should be noted that the models they estimate include multiple policy variables which may be highly correlated.

[10] Using PSID data, Hu (1993) does employ characteristics of the ex-husband as instruments (such as his age) but also uses characteristics of the couple (length of marriage, whether the marriage ended in divorce or separation) which one might expect to be correlated with the mother's unobserved propensity for AFDC participation.

classic work of Becker, Landes, and Michael (1977) and Becker (1981) on this subject. Throughout, I assume that if divorce occurs the mother becomes eligible for child support and the father becomes responsible for paying child support. I also assume that the prevailing divorce law is "unilateral" meaning that one spouse can individually initiate a divorce.[11] In the Becker model, divorce occurs if combined utility of the spouses in the "divorced" state exceeds combined utility in the "remained married" state. To arrive at this decision rule a number of assumptions are made. First, households are viewed as producing "commodities" from inputs of time and market goods. Second, the commodity output of marriage can be summarized in a single commodity which is known with certainty and can be allocated among spouses as income. The model also assumes that there is symmetric information about the post-divorce utility of each spouse and that individuals are risk-neutral. This latter assumption implies that maximizing utility is equivalent to maximizing expected commodity wealth. The final basic assumption is costless bargaining between spouses; in other words, all compensations between spouses are costless within marriage and at divorce. While relaxing this assumption does not change any of the basic predictions which are obtained below, the assumption is maintained for ease of illustration. Under the above assumptions, divorce occurs if and only if:

$$(1) \qquad Z_{Dh} + Z_{Dw} > Z_{Mh} + Z_{Mw}.$$

where Z denotes utility, D denotes divorce, M denotes marriage, h denotes husband, and w denotes wife. This inequality simply states that combined utility outside marriage exceeds combined utility inside marriage.[12] In this model, it is readily evident that

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[11] By 1987 (the beginning of my sample period), 90% of states had unilateral divorce laws. It is also worth noting that the basic Becker model has the same decision rule under mutual consent or unilateral divorce laws (given its assumption of costless bargaining), and Peters (1986) finds no effect of divorce laws on the probability of divorce.

[12] If we drop the assumption of costless bargaining and instead assume no bargaining between spouses (still assuming unilateral divorce), we have that divorce occurs if $Z_{Dh} > Z_{Mh}$ or $Z_{Dw} > Z_{Mw}$.

divorce occurs if each individual spouse has a utility gain to divorce under the current allocation of total marital utility, Z_M. When only one spouse has an individual utility gain to divorce, divorce will still occur only if the combined gain is positive.[13]

Using this model as a framework, the basic effect of Child Support Enforcement on the divorce decisions of couples with children is quite clear. A given increase in CSE is expected to increase Z_{Dw} and to decrease Z_{Dh}. Without further assumptions, the net effect of CSE on the probability of divorce is uncertain. To incorporate CSE explicitly and examine its effect in more detail, I add several assumptions to those stated above:

(A1) An increase in CSE raises the expected child support transfer in the divorced state.

(A2) The only effect of increased CSE on divorced parents is the direct income change due to the increase in the child support payment; there are no other effects of CSE on utility.

(A3) The ex-wife has a higher marginal utility of income than the ex-husband.

(A4) The AFDC program taxes child support income at 100%.

If increased enforcement raises the probability the government catches and penalizes all "deadbeat dads" who do not comply with child support obligations, then increased CSE should clearly raise expected payments for those cases in which the father is a "deadbeat dad" in the divorced state. However, I argue that this type of increased enforcement should also raise expected payments for "non-deadbeat" cases by increasing the probability that the father complies with the obligation in order to avoid being caught and penalized. For the purpose of simplification, the second assumption (A2) rules out the possibility of other effects of increased enforcement on the behavior of divorced

[13] To see this, consider the case in which spouse i has a gain to divorce, $Z_{Di} > Z_{Mi}$, but there is a combined loss to divorce, i.e. spouse j's loss to divorce, $(Z_{Dj}-Z_{Mj})$, outweighs i's gain, $(Z_{Di}-Z_{Mi})$. In this case, the other spouse, j, will compensate spouse i by an amount z (where $z<(Z_{Mj}-Z_{Dj})$) such that $Z_{Di}<(Z_{Mi}+z)$, and spouse i will no longer wish to seek divorce and no divorce occurs.

parents.[14] The third assumption (A3) is based on the well-known fact that women have considerably less income than their spouses in the divorced state.[15] It is then reasonable to assume that an equal absolute change in income for an ex-husband and an ex-wife has a larger effect on the wife's utility. The final assumption simply states the treatment of child support income by the U.S. welfare system. Since 1985, AFDC has allowed for a $50 monthly disregard of child support before the 100% tax is levied. For ease of illustration, this disregard is ignored in the discussion below.

Under the above assumptions, a positive shock to CSE changes the post-divorce utility of each spouse by changing the expected child support transfer, while it has no effect on total utility inside marriage or other components of post-divorce utility. Therefore, to assess the effect of CSE on the probability of divorce, we need only to examine the combined change in post-divorce utility directly induced by the change in child support income. Because the husband has to pay additional child support, the change in his post-divorce utility is negative. This can be written as:

$$(2) \qquad dZ_{Dh} = \lambda_h dC = -\lambda_h(C_1 - C_0),$$

where d denotes the change associated with the CSE increase, 0 denotes before the CSE increase, 1 denotes after the increase, C is expected child support in the divorced state, and λ is the marginal utility of income, which is assumed to be positive. Since we have assumed that $C_1 > C_0$, it is clear that $dZ_{Dh} < 0$.

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[14] In terms of potential labor supply effects on divorced/separated women, the theoretical prediction of the effect of child support is ambiguous (this is illustrated in the AFDC model section). Several studies have examined this relationship (Hu, 1993; Graham, 1990; Graham and Beller, 1989). Graham and Beller (1989) show a reduction of 6 hours in annual labor supply for another $1000 of child support income, while Hu (1993) finds a positive effect of child support income on hours worked. I know of no comparable studies for men.

[15] Recent government statistics indicate that in 1992, median income for a female household head with children present and with no husband present was $13445, while for a male household head with no children and no wife present median income was $34245 (U.S. Bureau of the Census, 1993b). Although these groups do not precisely correspond to divorced single mothers and divorced absent fathers respectively, the income pattern is nonetheless clear. Median income of divorced or separated single mothers in the 1990 CPS Child Support Supplement is $13000.

For the wife, I take into consideration the possibility that she will receive AFDC in the divorced state (and therefore be subject to the 100% tax on child support) and that AFDC participation is affected by child support receipt, i.e. endogenous.[16] The effect of an increase in CSE on the wife's utility can then be written as:

$$(3) \qquad dZ_{Dw} = \lambda_w(dC+dB) = \lambda_w[((1-p_a(C_1))C_1-(1-p_a(C_0))C_0) + (p_a(C_1)-p_a(C_0))b].$$

The notation remains as above with the additions that B is expected welfare income, $p_a(C_i)$ is the probability of AFDC participation in the divorced state evaluated at child support income of C_i, where i=0 or 1, and b is the welfare benefit. To simplify notation the other determinants of p_a (including b), which are assumed fixed between periods 0 and 1, have been suppressed.[17] To determine the net effect of CSE on the probability of divorce, I make the simplifying assumption that $p_a(C_i)$ takes on only two values, 0 and 1, and consider three possible cases: [1] $p_a(C_0)=p_a(C_1)=1$, [2] $p_a(C_0)=p_a(C_1)=0$, and [3] $p_a(C_0)=1$, $p_a(C_1)=0$.

In case [1], the mother fully expects to be on AFDC in the divorced state both before and after the increase in CSE. Given this, her change in expected child support income (dC) and change in expected welfare income (dB) are both equal to zero, which implies that there is no change in her post-divorce utility.[18] The net effect of CSE on divorce is then:

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[16] The effect of child support on the probability of AFDC participation is expected to be negative. Because AFDC is a means-tested program, this will be true even without behavioral effects of child support income, since increased child support reduces the likelihood of AFDC eligibility. The effects of child support on AFDC participation are explored in detail below.

[17] In line with the actual procedure typically used for women on AFDC, I assume that the child support payment goes directly to the welfare agency, which retains the payment in accordance with the 100% tax rate. Therefore, the welfare benefit check, b, the mother receives is unchanged when CSE increases. (If the mother received the child support directly, b would be reduced by the amount of the increase, and her net income would remain unchanged as above).

[18] If we explicitly account for the $50 disregard and C_0 is less than $50 per month, her change in post-divorce income can be positive, but it will be less than the change in child support as long as $C_1 > \$50$ per month.

(4.1) $$dZ_{Dh} + dZ_{Dw} = -\lambda_h(C_1-C_0).$$

This is unambiguously negative. Therefore, in the "always AFDC" case, we expect the probability of divorce to decrease as CSE increases. In case [2], the wife is not on AFDC in the divorced state either before or after the increase in CSE. Since the change in CSE raises her post-divorce income by the full amount of the change in child support, (C_1-C_0), the net change in total post-divorce utility is:

(4.2) $$dZ_{Dh} + dZ_{Dw} = (\lambda_w-\lambda_h)(C_1-C_0).$$

This is unambiguously positive given the assumption regarding the relative marginal utilities of income. Thus, in the "never AFDC" case, we expect the probability of divorce to increase as CSE increases. Finally, in case [3] the wife fully expects to be on AFDC before the CSE increase, but with this increase she expects to be off AFDC in the divorced state. This yields the following combined change in post-divorce utility:

(4.3) $$dZ_{Dh} + dZ_{Dw} = \lambda_w(C_1-b) - \lambda_h(C_1-C_0).$$

Without further restrictions, this expression may be positive, negative, or zero, and the net effect of CSE on the likelihood of divorce is ambiguous.

Given the opposing effects of CSE on fathers' and mothers' post-divorce utility, the discussion above clearly demonstrates that the net effect of CSE on divorce may be positive, negative, or zero, depending on the maintained assumptions.[19]

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[19] In this model, the effect of CSE on divorce is also predicted to vary according to the probability of AFDC participation in the divorced state. In particular, CSE should have a larger negative effect on divorce where AFDC participation is more likely. Empirical tests of this prediction revealed inconclusive results. In samples stratified by predicted AFDC participation probability in the divorced state, only two of the five measures of CSE used in the analysis showed significant, negative effects on divorce probabilities in the "high AFDC probability" sub-sample (where is defined as above the median predicted probability). In the "low AFDC probability" sample, the other three CSE variables had significant, negative effects on divorce.

4.2 Divorce: Empirical Framework

In the model of divorce outlined above, divorce occurs if the net utility gain to divorce is positive. The probability that divorce is observed is equal to:

$$(5) \qquad P(d^*) > 0 \qquad \text{where} \qquad d^* = ((Z_{Dh} + Z_{Dw}) - (Z_{Mh} + Z_{Mw})).$$

In (5), P denotes probability, and d^* is the net utility gain to divorce. I then assume that we can express d^* as a function of a vector of individual characteristics, X, and the expected child support transfer, C:

$$(6) \qquad d^* = g(X, C).$$

While both the net utility gain, d^*, and the expected transfer, C, are unobserved, we do observe the outcome of the divorce decision, d, and measures of state Child Support Enforcement, E, which are expected to shift C. Assuming a linear functional form we can then write the following reduced form expression for divorce outcomes in a single cross-sectional sample:

$$(7) \qquad d_{ij} = X_i\alpha_1 + E_j\alpha_2 + u_i \qquad \text{where} \qquad d_{ij} = 1 \quad \text{if } d^* > 0$$
$$d_{ij} = 0 \quad \text{if } d^* \leq 0,$$

and i indexes individuals (couples), j indexes states, and u is the error term.

In equation (7), I assume that the variables in X are exogenous, i.e. $E[u|X]=0$. Under the additional assumption that $E[u|E]=0$, estimates of α_2 provide an unbiased estimate of the effect of CSE on the probability of divorce. However, if there are unmeasured state level variables which are correlated with divorce and also correlated with state CSE strength, E, the estimates of α_2 (and α_1) will be biased. For example, if high welfare benefits encourage divorce and states with high welfare benefits tend to have strong enforcement programs, then without controlling for welfare benefits in (7),

estimates will be biased.[20]

The approach that I take to address this issue is twofold. First, I control for a rich set of state characteristics that are potentially correlated with CSE and divorce decisions. These include the divorce rate, the percent of the population that is Catholic (both measured prior to the survey period), welfare benefit levels, and state income measures. I also include regional fixed effects in the vector of individual characteristics, X. Secondly, as a specification check on my results, I re-estimate the divorce equation on a control group of women without dependent children. These women's divorce decisions should not be affected by CSE since they would be ineligible for child support in the divorced state. Thus, if the model is well-specified, we should see zero effect of CSE on divorce decisions in this group. If however, there remain unobserved state characteristics which affect divorce decisions and are correlated with CSE, we would see effects of CSE in this "CSE ineligible" group.[21] This strategy is related to that used by Ellwood and Bane (1985) in their analysis of the effects of welfare generosity on state divorce rates.

In my empirical analysis, I apply the divorce equation to a pooled cross-section data set of women from 1988 and 1990 Current Population Surveys. Taking into account the two survey years and the state control variables yields the following reduced form divorce equation:

$$(8) \qquad d_{ijt} = X_{it}\alpha_1 + E_{jt}\alpha_2 + S_{jt}\alpha_3 + u'_{ijt},$$

where t indexes survey year, S is the vector of state controls, and u' is the error term. The components of X, E, and S are fully described in the Data section of the paper.

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[20] In fact, cross-section regressions of state CSE measures on state AFDC maximum benefit levels indicate a positive, significant relationship between AFDC generosity and CSE strength for three of the five measures of CSE used in this study; the relationship is statistically insignificant for the other two measures.

[21] Another potential way to address this issue is to include a vector of state fixed effects in the equation. However, this requires sufficient within-state over-time variation in the CSE variables if the effects of CSE on divorce are to be identified. Analysis of state level CSE data for the entire 1980-1990 period revealed that the primary source of variation in state CSE program variables is between states rather than within-state over-time. The bottom line is that there is insufficient over-time variation in the state CSE variables to include fixed effects in this analysis and still obtain meaningful results.

4.3 AFDC: Theoretical Framework

To model AFDC participation, I use a standard utility maximizing framework in which the single mother's utility is a function of consumption and leisure. I assume that the single mother chooses to participate in the AFDC program when maximum utility in the on-AFDC state exceeds maximum utility attainable in the off-AFDC state. An increase in child support is expected to decrease the probability that maximum utility is higher in the on-AFDC state. This prediction results directly from the treatment of child support income by the AFDC system and is clearly illustrated by examining the single mother's budget set, which is presented in Figure 1. Due to the nature of the welfare system, this budget set is both non-linear and non-convex. At zero hours of work, the single mother has an income of A, equal to the AFDC maximum benefit. In this illustration, I have assumed that she initially has $0 of non-labor income. Given this, her initial budget set is represented by ABC. Her break-even point, which represents the hours of work at which her welfare benefit goes to zero, is at B. The on-AFDC portion of her budget set is segment AB, and the off-AFDC portion is segment BC.[22]

To illustrate the effects of an increase in child support on AFDC participation, I first consider a simplified case in which there is no $50 disregard applied to child support (this is equivalent to assuming the initial level of child support exceeds $50 per month since in either case all additional child support is taxed at 100%). I also assume that the increase in child support income is not a function of the mother's income level. Due to the 100% tax rate on child support income imposed by AFDC, an increase in child support of the amount CE (depicted in Figure 1) causes the non-AFDC segment to shift upward by the distance CE while the AFDC segment does not shift. The single mother's new budget set is denoted by ADE. The new break-even point is D, the new on-AFDC segment is AD, and the new off-AFDC segment is DE. In Figure 1, it is clear that all new opportunities created by the increase in child support income are in the off-AFDC state. As a result, the likelihood that she participates in AFDC is expected to

[22] In this discussion, I assume that at hours of work below the break-even level, B, the single mother takes up AFDC, i.e. there are no non-participating eligibles. It should also be noted that for ease of illustration, Figure 1 does not incorporate Medicaid or other public transfers.

decrease when child support increases. To see this result more clearly, we can examine the effects of the increase in child support according to the initial location of the single mother along the budget set. First, if the single mother is originally located along segment BC, she locates along DE with the increase in child support, and her welfare participation status is unchanged (at non-participation) though her labor supply should decrease. In contrast, if she is originally located along segment DB, she becomes ineligible for welfare at the higher level of child support. Therefore, her participation status changes from on-AFDC to off-AFDC, and her labor supply may increase, decrease, or be unchanged. Finally, if she is originally located along segment AD, she may either not change her behavior or may switch to segment DE, in which case her participation status changes from on-AFDC to off-AFDC, and her labor supply increases. It is clear that AFDC participation is either unchanged or decreases in every case. Therefore, we expect child support to have a negative effect on AFDC participation.[23]

Figure 2 illustrates the budget set if we explicitly take into account the $50 disregard of child support. When child support increases by the amount CE, the single mother's budget line becomes FGE. In this case, her non-labor income in the on-AFDC state increases but by less than the increase in the off-AFDC state (assuming the increase of $CE exceeds $50 per month). While we still expect overall welfare participation to decrease, it is less likely that the single mother switches from the original on-AFDC segment to the new off-AFDC segment, than without the disregard in place. As well, there is a small probability that a woman initially along the non-AFDC segment (BC) will relocate along segment FG after the increase (for this to occur she must be located near B before the change); the likelihood that this perverse effect occurs decreases with the amount of the child support increase.

4.4 AFDC: Empirical Framework

As stated above, we observe AFDC participation when maximum attainable utility

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[23] On the other hand, labor supply may increase, decrease or remain unchanged when child support increases. The effects of child support income on labor supply have been studied by several authors including Hu (1993), Graham (1990), and Graham and Beller (1989).

is higher in the on-AFDC state. I assume that we can express the net utility gain to AFDC participation as a function of a set of variables that determine the shape of the single mother's budget set and the shape of her indifference curves. In general terms:

$$(9) \qquad a^* = a^*(A, C, N(X,S), w(X,S), X, S),$$

where a^* denotes the utility difference, A is the AFDC guarantee (maximum benefit), C is actual child support income, N is other non-labor income, w is her wage, X is a vector of individual characteristics, and S is the vector of state level control variables. In this model, we observe the child support variable of interest, C, and can include it directly in the AFDC equation. In terms of the wage and other non-labor income variables which are both potentially endogenous, I take a reduced form approach and directly enter the exogenous determinants of these variables (X and S) in the AFDC equation.[24] As in the divorce equation, we do not observe the actual utility difference but instead observe an indicator variable for the outcome of the decision. Assuming a linear functional form and writing equation (9) in terms of the observed outcome variable we have:

$$(10) \quad a_{ijt} = C_{it}\gamma_1 + X_{it}\gamma_2 + S_{jt}\gamma_3 + v_{ijt}, \qquad \text{where} \qquad a_{ijt}=1 \text{ if } a_{ijt}^*>0$$
$$a_{ijt}=0 \text{ if } a_{ijt}^* \leq 0,$$

and a=1 corresponds to AFDC participation, a=0 to non-participation, i indexes individuals, j indexes states, t indexes survey year, and v is the error term.

In the AFDC equation (10), there are two key factors which may potentially bias the estimates of the effect of child support income on AFDC participation. These are measurement error in child support and unobserved heterogeneity, respectively. There are several reasons to suspect that reports of child support income suffer from

[24] The wage variable is also unobserved for non-workers. The empirical results presented below are not sensitive to the inclusion/exclusion of observed other non-labor income.

measurement error. First, child support is an unpredictable and irregular source of income. Among single mothers with child support awards in place, approximately half do not receive regular payments.[25] Second, if a mother is receiving AFDC benefits it is typically required that any child support from the father be paid directly to the state's CSE or welfare agency rather than to her. These two facts both raise the likelihood of inaccurate reporting of annual child support income by single mothers. Furthermore, since child support is taxed away by AFDC, women on AFDC have no incentive to report any under-the-table payments they receive directly from the father. Finally, comparisons of reported 1989 annual child support income in the March 1990 CPS main survey and the April 1990 CPS Child Support Supplement for the same individual indicate a large degree of variation between the two reports. Of those women reporting a positive amount of child support in the April survey, only 24% report the same amount in the March survey, and the correlation between the two reports for all cases is .63.[26] These pieces of evidence all support the argument that child support income is measured with error in survey data, which will induce bias in the AFDC equation. In a multivariate Probit model, such as the one estimated below, the sign of measurement error bias is indeterminate.

Unobserved heterogeneity provides a second reason to be concerned that estimates of the coefficients in equation (10) may be biased. In other words, there may be unobservable individual characteristics included the error term, v, which are correlated with both AFDC participation and with child support income, C. This bias could go in either direction. For example, we might expect that mothers who are more opposed to receiving any assistance from the government (an unobserved characteristic) are both less likely to take-up AFDC and less likely to obtain help from CSE in securing child support. This would induce positive bias in the estimated effect of child support on

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[25] Authors tabulations based on the 1988 and 1990 CPS Child Support Supplements.

[26] Of the 76% reporting different amounts in the two surveys, the median of the absolute value of the difference between the two reports is $1088 (the mean is $1816), and in 90% of the cases the absolute value of the difference exceeds $143. For all cases, the mean of the absolute value of the difference is $624, the minimum is $0, and the maximum is $22897.

AFDC participation. At the same time, we might expect that particularly ambitious mothers are less likely to receive AFDC but more likely to secure child support payments from the father. This type of unobserved characteristic would induce negative bias.[27]

To address these potential biases in my estimation, I assume that the Child Support Enforcement measures, E, provide a vector of exogenous variables that are correlated with child support income, C, and uncorrelated with the error term, v. This yields a reduced form equation for the endogenous child support variable:

$$(11) \quad C_{ijt} = Z_{ijt}\beta_1 + E_{jt}\beta_2 + w_{ijt},$$

where Z=[X, S] is the vector of all exogenous variables in the AFDC equation (10), and w is the error term. For the variables in E to provide valid instruments for C, two conditions must hold: (i) the state CSE variables (E) are significant predictors of individual child support income, and (ii) these variables are uncorrelated with unobservable determinants of individual AFDC participation, or $E[v|E]=0$. I maintain that once we have controlled for the rich set of individual and state level characteristics in (10'), condition (ii) holds.[28] The expectation that (i) holds is based on the idea that CSE has both a direct, positive effect on the child support receipts of single mothers using the CSE system and an indirect, positive effect on the child support receipts of women outside the system. Beron (1988) provides a formal model of the absent father's payment of child support based on expected utility maximization which predicts that increased enforcement raises payment (decreases nonpayment). The validity of (i) can also be directly examined by estimating (11) and testing the statistical significance of the

[27] It has been suggested to me that negative bias could also result from the AFDC tax on child support income which reduces the incentive for payment of child support when the mother is on AFDC (dependent variable equal to 1). In other words, the father's payment amount depends negatively on the mother's participation decision.

[28] For this to be true, CSE must not affect entry into the pool of single mothers in a systematic way such that unobserved propensities to be on AFDC are correlated with state CSE strength. If increased CSE affects not only the size but also the composition of the pool of single mothers in a way related to AFDC participation, then a potential sample selection problem arises. I address this issue in Appendix 1.

estimates of β_2, which is done below.

Substituting equation (11) into equation (10) we obtain a reduced form expression for AFDC participation as a function of state CSE variables, individual characteristics, and the state level control variables:

$$(12) \quad a_{ijt} = E_{ij}\delta_1 + X_{it}\delta_2 + S_{jt}\delta_3 + \mu_{ijt},$$

where the notation remains as above, and μ is the error term. In this equation, the coefficients on the CSE variables represent the net effect of CSE on AFDC participation. Assuming that CSE increases child support and that child support income decreases the probability of AFDC participation, we expect the effect of CSE to be negative in sign. To obtain a direct estimate of the net effect of CSE on AFDC, I estimate equation (12) on a sample of single mothers. To quantify the effect of child support on AFDC, I then estimate the relationship between child support income and AFDC participation, as expressed in equation (10), using the CSE variables, E, as instruments for child support.

5. Data

5.1 Individual Level Data

The individual level data used in this analysis is taken from the 1988 and 1990 April/March match files of the Current Population Survey (CPS). This match provides demographic and income data from the March CPS survey for all respondents plus additional information on marital history and child support payments for the subsample of women with children from an absent father who are interviewed for the April CPS Child Support Supplement. To study the rate of marital dissolution using the cross-sectional CPS data I compare women who are (a) currently married and never divorced, to those who are (b) currently divorced or separated and have recently experienced marital breakup (within the five years prior to the survey).[29] The women in group (a)

[29] This closely follows the method used by Peters (1986) to study the effect of divorce laws on divorce rates using the 1979 CPS. For completeness, I have also estimated "stock" estimates for the effect of CSE on the probability of being "currently divorced/separated." These stock estimates show the same pattern

correspond to couples for whom the expected utility of marriage exceeds that of divorce (no divorce occurs), while the women in group (b) correspond to couples for whom the opposite holds (divorce is observed).[30] The dependent variable, which is equal to 0 for group (a) and equal to 1 for group (b), represents the probability of becoming divorced in years (t-5) to (t) given no previous divorces, where (t) is the survey year. Again, "divorce" refers to both divorce and separation.

The main sample used in the analysis of CSE and divorce is composed of women with dependent children since this is the group which is eligible for child support. In practice, my sample consists of the 22,212 women between the ages of 18-64 in the 1988 and 1990 CPS with children under age 18 who are in groups (a) and (b) described above.[31] This sample clearly excludes a number of types of women, such as remarried women, women without dependent children, and women who have never married. Because it is possible that CSE affects decisions regarding childbearing and marriage, I acknowledge the potential for sample selection bias and address this issue in Appendix 1. As another specification check on my results, I estimate the divorce equation on the sample of 18,270 women in groups (a) and (b), who do not have dependent children. Again, because divorce decisions of couples ineligible for child support should be unaffected by CSE, we can use this second sample as a "control" group to check whether the estimated effects in the main sample truly reflect CSE effects or are merely picking up unobservable state characteristics which are correlated with divorce and CSE.

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as those discussed below for the probability of "recently becoming divorced/separated," i.e. negative and significant effects of CSE on divorce in the main sample and near zero, insignificant effects in the control group.

[30] Recall that divorce here refers to both separation and divorce. In the CPS women are coded as "separated" if they are legally separated, living apart with intention to divorce, permanently or temporarily estranged from spouse; all of these situations coincide with eligibility for child support.

[31] To have a common sampling rule for women in groups (a) and (b), I am restricted to information in the March portion of the match file to define eligibility for child support. Because the 1990 April/March match file does not include a variable for the age of the youngest child, the best available definition is "child(ren) under age 18." The implication of this is that some women who had eligible children at the time of the divorce are excluded from the main sample. Estimates using 1988 data only, in which I can identify the age of the youngest child in the divorce year, yield similar results to those obtained below, though the estimates are less precise since the sample size is half as large.

Definitions of the CPS variables used in the divorce analysis are presented in Table 1, and means and standard deviations of these variables for both the main sample and the control group are presented in Table 2. The mean of the dependent variable, divorce, is .119 in the main sample and .097 in the control group. The vector of individual characteristics, X, includes race, age, education, SMSA, central city, region, and survey year.[32] The means of these variables in the two samples are quite similar, with the exception of age. This difference is not surprising since the total age range is 18-64 and membership in the control group is defined by having no children under 18.[33]

The primary sample used in the AFDC participation analysis consists of the 5,646 women in the 1988 and 1990 CPS who are categorically eligible for both child support and AFDC. In other words, these women are currently single and have children under 18 in the household from an absent father. Means and standard deviations of the CPS variables for this sample are presented in Table 2. The set of individual control variables includes those used in the divorce analysis plus variables for the number of children ages 0-5, the number of children ages 6-17, and never-married status, which are considered important determinants of both AFDC participation and child support.[34] In this sample, 31% of the women are on AFDC, and the average annual amount of child support received is $946 (in real 1988 dollars). Among the 36.5% of all single mothers who receive child support, the average amount received is $2592 (an average of $216 per

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[32] Because education may be considered endogenous, I have also re-estimated the divorce equation excluding this explanatory variable. I find that the results are not sensitive to the exclusion of the variables for education level.

[33] To address possibility sensitivity of the results to this age difference in the 18-64 year old samples (in particular a mean age of 35 in the main sample and 46 in the control group), I re-estimated the divorce equations for the main sample and the control group restricting these samples to women ages 18-55 (in which case we have a mean age of 35 in the main sample and 40 in the control group). The results discussed below regarding the effects of CSE on divorce probabilities are not sensitive to excluding women ages 56-64.

[34] These variables are not included in the divorce analysis for the following reasons: (1) the never-married variable is not relevant to the divorce analysis and (2) I want to include the same variables in the estimation for the main sample and the control group and number of children 0-6 and 6-17 is zero for all individuals in the control group. I have also re-estimated the AFDC equations without these added variables and obtain similar results though the magnitude of the estimated effect of CSE is slightly larger when these variables are excluded.

month), and the AFDC participation rate is 21%. Among those not receiving support, the AFDC participation rate is 36%. As above, I recognize the potential for sample selection bias due to the exclusions made in defining the AFDC sample (all remarried women, married mothers, and women without dependent children are excluded), and I address this issue in detail in Appendix 1.

The main advantages of the CPS data are that it provides a large nationally representative sample of women and that it has information on marital history and child support income for single mothers. As noted above, there are some limitations in precisely identifying the women eligible for child support at the time of the divorce decision (defining the main sample). Finally, it should also be noted that while AFDC is a monthly program and child support payments are generally due on a monthly basis, the CPS only provides information on AFDC participation and child support income during the past year as a whole.

5.2 State Level Data

The Child Support Enforcement data which I use primarily comes from Annual Reports to Congress of the Office of Child Support Enforcement (OCSE). These reports provide detailed CSE program statistics for each state agency. To measure the strength of state Child Support Enforcement I focus on five measures, which are described below. Four of these measures are based on data in the OCSE Annual Reports and the fifth comes from the U.S. House Ways and Means, Child Support Enforcement Report Card (1990). Definitions of all five variables are presented in Table 1. These variables are matched to the individuals in the CPS according to state of residence and year.[35] Summary statistics for the state level variables for the 102 relevant observations (50 states and D.C. over 2 years) are presented in Table 3, and correlations of the CSE

[35] I have matched fiscal year 1989 and 1987 CSE data to the 1990 and 1988 CPS respectively. The prior year is used primarily because child support income in the CPS is reported for the previous year. It should also be noted that the state of residence is measured in the survey year. Therefore, if a woman was divorced in an earlier year, (t-5) to (t-1), and subsequently moved to a different state there will be measurement error in the CSE variable, since the variable in the model is state CSE at the time of the divorce decision.

variables are in Table 4.

The first measure of Child Support Enforcement is the state's "collection rate," which is defined as the percent of CSE cases in which a collection was made. The mean of this variable is 17.6%, and its value ranges from 4.1% to 37.6%. Presumably, states with relatively high collection rates are more successful at enforcing payment of child support, and living in a state with a high rate should increase the probability that child support is paid. The second measure, "accounts receivable," is the ratio of dollars collected to dollars due for both current and prior obligations in the CSE system, and its mean is 25%.[36] The accounts receivable variable provides a measure of the state's ability to collect support relative to the total value of the child support obligations that have been established for families in the CSE system. The third measure is normalized "average collections," which I define as total collections per CSE case divided by state median household income. This statistic summarizes both the likelihood of collection and the amount collected given that collection occurs. Dividing by median household income adjusts for the fact that states with higher income levels will have higher collection levels regardless of the effectiveness of the CSE agency. The fourth CSE variable is a "composite" measure of CSE effectiveness which I constructed by ranking states' CSE in terms of the following criteria: the collection rate, average collections, cost effectiveness (collections per dollar spent), and order establishment (number of orders established per single parent family).[37] The final CSE variable is a grade point average (GPA) assigned to the state by the U.S. House Ways and Means Child Support Enforcement Report Card which was computed based on measures of paternity establishment, cost-effectiveness, accounts receivable, and AFDC cost reduction. The correlation matrix in Table 4 shows that all five CSE variables are positively correlated

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[36] The comparable variable for current obligations only has a mean of approximately 50%.

[37] Specifically, I ranked each state in each year according to its value for each of the criteria listed above. I then grouped states into quintiles with the worst ten performers receiving a rank of 0, the next ten a rank of 1, and so forth with the best group receiving a rank of 4. Then each state received a composite ranking equal to its mean rank across the four criteria, i.e. a state that ranked 2, 3, 2, 2 would have a value of 2.25 for the "composite" CSE variable.

and the correlations between the collection rate, average collections, and the composite measure are each over .80.[38] This degree of correlation has two implications for how I approach the analysis. First, because I am particularly interested in identifying the sign of the effect of CSE in the reduced form divorce and AFDC equations, I enter the CSE variables individually in the estimations. If multiple measures were included, individual coefficients on the CSE variables would be unreliable due to the multicollinearity between these variables. Second, when I use the CSE variables as instruments for child support, I focus on the joint statistical significance of multiple measures.

The other state level variables included in the analysis come from a variety of sources which are listed in a Data Appendix available from the author. In the equations estimated below, this set of state level controls is designed to capture state characteristics and attitudes that may be correlated with the outcome of interest (divorce or AFDC) and the Child Support Enforcement variables. The state divorce rate and percent of the population that is Catholic (both measured in 1980) are included to measure the unobserved propensity to divorce in state j.[39] Two variables related to the income level of the state in the survey year, namely per capita personal income and average wages in manufacturing, as well as measures of both welfare generosity (AFDC maximum benefit for a family of four) and the age distribution of the population are also included.

6. Estimation and Results

6.1 CSE and Divorce

The first part of the empirical analysis examines the effect of Child Support Enforcement variables on the probability of marital dissolution. The divorce model

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[38] The relatively low correlation of the accounts receivable variable with the other CSE variables may be explained by the fact that this variable includes the states' collection ability with respect to the backlog of overdue prior support obligations, while the other measures focus more on current obligations.

[39] According to the model of divorce outlined above, the state's divorce law should not affect the divorce probability and this variable is not included in the results presented below. Estimates including a dummy variable for whether the state had a "unilateral" divorce law as of 1987 showed that this variable had an insignificant effect on divorce as expected. Interactions between CSE and the divorce law were also found to be insignificant for all five of the CSE variables.

generates a limited dependent variable equal to 1 if the utility difference is positive and equal to 0 otherwise, and the divorce equation (8) is estimated by maximum likelihood Probit. I consider two different samples in my analysis: the main sample of women with children and the control group of women without dependent children. Given the high degree of correlation between the CSE measures and my interest in identifying the direction of the effect of CSE on divorce, I estimate five separate equations each including a different measure of CSE. Each equation also includes the individual characteristics, X, and the state control variables, S, listed in Table 1.[40]

The Probit estimates of the effects of the Child Support Enforcement variables on the likelihood of divorce are presented in Table 5. The first column provides the central results. Each of the five alternative measures of CSE has a negative effect on the probability of divorce in the main sample. Four out of the five estimates are significantly different from zero at the 5% level or better, and the fifth is significant at 10%. The clear implication of these results is that CSE deters divorce. This finding is consistent with the incentive effects of increased CSE on fathers' divorce decisions. In particular, by increasing the financial obligation of the father to the single mother family after divorce, CSE raises the cost of divorce for the father and reduces his incentive to divorce. The negative net effect of CSE on divorce probabilities observed in the data suggests that the effect of CSE on fathers outweighs the opposing effect on mothers, whose costs of divorce decrease.

To facilitate comparison across these five estimates given that the CSE variables are measured in different units, I take each coefficient and calculate the predicted percentage change in the average probability of divorce for both a 1% increase in CSE and a one standard deviation increase in CSE. These estimates are presented in Table 6. For a 1% increase in CSE, the divorce rate is estimated to decrease by 0.10-0.16% depending on the measure of CSE. For the larger, one standard deviation increase in CSE, the average divorce probability falls by 4.2-6.7%, or .5-.8 percentage points.

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[40] I have also estimated models including interactions between the CSE variable and individual demographic characteristics (age, race, education) to test for variation in the effect of CSE along these lines. However, the interaction terms were never statistically significant.

As a specification check on the main set of results discussed above, I re-estimate the divorce model on a group of women who do not have dependent children and are therefore ineligible for child support. If the CSE variables are truly measuring the effect of enforcement on divorce, the coefficients on these variables should be zero for the control group since divorce decisions of couples ineligible for child support should not be affected by CSE. On the other hand, if the CSE variables are picking up the effects of unobservable state attitudes and characteristics that are correlated with divorce and CSE, then we would expect to see effects of the CSE variables on divorce in both samples. Thus, estimating the divorce equation on the control group provides useful information about the estimated effects of the CSE variables in the main sample. In particular, finding an effect of CSE in the ineligible group would call into question the above result. The estimates for the control group are presented in Column 2 of Table 5. Across the board, the coefficients are near zero, and in all cases they are statistically insignificant. Given this result, we can be more confident that the negative effect of CSE on divorce evident in the main sample (women with dependent children) truly reflects the effect of CSE on divorce. As mentioned earlier, further specification checks addressing potential sample selection bias are presented in Appendix 1. Those results demonstrate that the negative effect of CSE on the probability of becoming a divorced single mother is robust to sample definition.

Table 7 provides complete coefficient estimates for the divorce equation in the two samples when the collection rate is the included CSE variable (Row 1 of Table 5). The estimated coefficients are generally consistent with prior expectations. In both the main sample and the control group, the state divorce rate is associated with higher probabilities of divorce. Since AFDC benefits improve the opportunities outside marriage for women with dependent children but not for women in general, we expect to see a similar pattern in the estimates for the AFDC benefit variable as for the CSE variables between the two samples, i.e. an effect in the main sample and no effect in the control group. For AFDC benefits, we expect the effect in the main sample to be positive. The empirical results are consistent with this expectation. Maximum AFDC benefits have a positive, significant effect on divorce in the main sample and a near zero, insignificant

effect in the control group.[41] This provides a second check on the divorce equation results. In both samples, I find that blacks and less-educated women are more likely to divorce (the omitted categories are whites and education of college and beyond, respectively), and that there is a non-linear relationship between education level and divorce probabilities. In each case, the education level with the highest relative probability of divorce is 9-11 years of education.

6.2 CSE and AFDC Participation

In the first part of the AFDC analysis, I estimate the reduced form AFDC equation (12). This provides estimates of the net effect of state CSE on the probability of AFDC participation. This effect is expected to be negative due to the negative relationship between child support income and AFDC participation outlined in the model and the anticipated, positive relationship between CSE and child support income. If both of these relationships hold, we will observe a negative effect of the CSE variables on AFDC participation.

In the reduced form AFDC analysis, I follow the method used in the divorce analysis above and estimate five Probit equations each including a different measure of CSE. Each equation also includes the set of state level controls, S, and individual characteristics, X, included in the divorce analysis (see Table 1) plus additional variables for the number of children ages 0-5, the number of children ages 6-17, and never-married status, as explained in the Data section above. I estimate the AFDC equation on four samples: the full sample of 5,646 single mothers and three subsamples defined by marital status and the timing of the transition to single motherhood. This is done to explore potential differences in the estimated effects of CSE across well-defined groups of single mothers, who are expected to differ in the extent to which they are directly affected by the CSE program.

To create the subsamples, I first separate single mothers according to whether

[41] This confirms the results in Ellwood and Bane (1985). These authors also find this pattern in the effects of welfare generosity on divorce.

they have ever been married. We might expect to see different effects of CSE for these two groups due to differences in the relevance of the CSE program to the child support collection experience of the group. For instance, it is likely that a larger portion of never-married single mothers are directly involved in the CSE system due to the high rate of AFDC participation in this group and the required CSE participation of AFDC recipients. If this is true, then the CSE variables should directly affect a larger share of the never-married sample relative to the ever-married sample and we would expect to see larger effects in this group. On the other hand, there is also the possibility that measures such as "accounts receivable" are not very relevant to the never-married group because it focuses on collections for the cases in which orders have been established, which is a small fraction of never-married women.

The second division of the sample is made by exploiting the marital history information available for ever-married women in the CPS Child Support Supplement to split this group according to whether they have recently made the transition to single motherhood (as in the divorce analysis, "recent" is defined as the five year period prior to the survey). Here I expect the variables measuring current state CSE strength to have larger effects on the recently divorced group. This is based on the idea that a larger fraction of recently divorced single mothers are currently participating in the CSE program and/or currently engaged in efforts to obtain support compared to those divorced less recently. Therefore, a relatively larger share of the "recently" divorced should be directly and indirectly affected by current measures of state CSE strength.

The Probit estimates of the effects of CSE on AFDC participation are presented in Table 8. The first column presents the results for the full sample of single mothers. The estimates of the effect of CSE on AFDC in this sample are all negative in sign, as expected, and the collection rate and the composite measure coefficients are each statistically significant at the 5% level.[42] In the remaining three columns, I present

[42] Potential variation in the effect of CSE at different levels of AFDC generosity has also been considered. Estimates including an interaction term of the included CSE variable and AFDC maximum benefits provide suggestive evidence that a given increase in CSE may have a smaller deterrent effect on AFDC participation where AFDC benefits are higher; however, the coefficient on the interaction term was only statistically significant for two of the five different CSE measures.

estimates of the reduced form AFDC participation equation as applied to the three subsamples of single mothers: recently divorced, non-recently divorced, and never-married. The results suggest that CSE decreases the probability of AFDC participation among the recently divorced and never-married single mothers but not among single mothers who divorced more than five years ago. In the recently divorced and the never-married samples, each of the CSE coefficient estimates in each of the five equations estimated is negative except for a positive, insignificant coefficient on accounts receivable for the never-married. As well, the magnitude of the effects on AFDC participation implied by these Probit coefficient estimates are larger in the never-married and recently divorced samples than in the full sample. As noted above, the insignificant effect of the accounts receivable variable may be due to the fact that few never-married women have awards and this statistic measures collections on established obligations. With smaller sample sizes the coefficient estimates are less precise in the subsamples relative to the full sample. Still, three of the five CSE measures have statistically significant effects on AFDC participation at the 10% level or better in the recently divorced sample, and two have significant effects in the never-married sample.

In contrast, there is little to no evidence that CSE reduces the AFDC participation rates of ever-married single mothers who divorced more than five years ago (before 1983 or 1985 respectively). Three of the CSE variable coefficient estimates are positive in sign, and only one variable, accounts receivable, has a statistically significant negative effect. Since the accounts receivable value for year t includes collections on unpaid support due in years prior to t, it may be more relevant to those divorced in earlier years compared to the other CSE variables employed. Overall, the AFDC reduced form results suggest that current state CSE strength is associated with lower probabilities of AFDC participation among single mothers, except perhaps among the ever-married single mothers whose divorce or separation occurred more than five years ago. My findings are consistent with the idea that both recently divorced and never-married single mothers are more likely to be affected by current CSE strength.

The first column of Table 11 presents complete coefficient estimates for the reduced form AFDC equation estimated on the full sample of single mothers which

includes the collection rate CSE variable. I find that the AFDC maximum benefit level in the state is positively associated with the probability a single mother participates in AFDC. This result is consistent with the budget set framework outlined above since a higher maximum benefit increases the single mother's opportunities in the on-AFDC state. All of the individual characteristics included in the equation are significantly related to AFDC participation probabilities. In particular, I find that never-married women, blacks, and other non-whites are more likely to participate in AFDC relative to ever-married women and whites respectively. The presence of an additional child significantly increases the probability of AFDC participation, and evaluated at the mean, the increase associated with an additional child age 0-5 years is larger than the increase for an additional child between the ages of 6-17 years. Finally, the single mother's education level is negatively related to AFDC participation. The samples examined in the AFDC analysis above are all restricted to single mothers. To address the possibility that CSE could affect selection into single motherhood, Appendix 1 presents results for broader samples of women, which provide evidence that the negative effects found here are not the result of selection bias.

6.3 Child Support Income and AFDC Participation

In this part of the paper, I quantify the effect of child support on AFDC by estimating the effect of actual child support income on AFDC participation. To consistently estimate the effect of child support income on participation, we need to correct for the potential biases stemming from measurement error and unobserved heterogeneity in reported child support, as discussed above. The typical way to handle this is through an instrumental variable procedure. Given the limited dependent variable in this model, the empirical approach I take is to estimate the AFDC participation equation by a two-step Probit technique outlined in Newey (1987).[43] Briefly stated, the

[43] Angrist (1991) suggests that linear instrumental variable estimation (i.e. two stage least squares) is appropriate in this type of setting. I have repeated my empirical analysis of AFDC participation using two stage least squares and obtain similar results to those obtained using the two-step Probit technique. The two-stage least squares estimates suggest 1.3-1.6 percentage point reductions in AFDC for a $100 increase in child support, compared to 1.6-1.9 percentage point reductions obtained by two-step Probit.

first step of this estimation is an ordinary least squares (OLS) regression of child support income on the exogenous variables in the AFDC equation and the Child Support Enforcement variables, E, which serve as instruments for child support income, C. The second step is maximum likelihood Probit estimation of the AFDC model, including predicted residuals from the first step estimation as an additional regressor. The coefficient on the first stage residuals provides an estimate of the correlation between the error terms in the AFDC equation (10) and the child support equation (11), and we can use this coefficient to test whether the error terms are significantly correlated. A full description of the estimation method is provided in Appendix 2.

Based on the reduced form AFDC estimates, we expect that the CSE variables are relatively stronger predictors of child support income for recently divorced and never-married single mothers than for the ever-married single mothers who divorced less recently. As discussed in Staiger and Stock (1994) for the case of two stage least squares, the larger the first stage F-statistic from testing the hypothesis that the instruments enter the first stage, the more reliable and less biased are second step estimates. For this reason, I have chosen to estimate the AFDC participation equation (10) both for the full sample of single mothers and for the combined subsample of recently divorced and never-married single mothers in which we expect the CSE variables are better instruments for child support income and therefore the second stage results should be more reliable (less biased).[44] For both samples, I estimate the AFDC equation by two-step Probit using four different combinations of CSE variables as instruments and also by one-step Probit for comparison.[45] Each equation includes the state level control variables, S, and the full set of individual characteristics, X (including the variables for

[44] I have also re-estimated the model including divorced women with children from an absent father who have since remarried. These women are not included in the sample of interest because the AFDC participation decision is not open to them (they are not single). I find that my results are not very sensitive to this exclusion: the estimated effect of $100 increase in child support is 1.5-1.8 including remarried compared to 1.6-1.9 excluding remarried.

[45] In the estimates presented here, I have not used the accounts receivable variable as an instrument because of missing values for nearly 10% of the sample. Estimates which employ this variable yield similar though somewhat less precise results than those presented in Tables 9 and 10.

the number of children and never-married status), which are listed in Table 1. The key results from these estimations are presented in Tables 9 and 10 respectively.[46]

In both Table 9 and Table 10, the last row provides the results of F-tests of the hypothesis that the coefficients on the CSE variables included as instruments in the first stage are all equal to zero. For each set of instruments, the respective F-statistic is larger in the subsample. This suggests that the CSE variables are in fact stronger predictors of child support income in the subsample (Table 10) as expected.[47] The coefficient estimates for the child support income variable are presented in the first row of each table. The estimates are consistent with the theoretical prediction that child support income has a negative effect on AFDC participation. The point estimates of the effect of child support income on AFDC in the two-step Probit are similar in the two samples, though slightly larger in magnitude for the subsample. The estimates are also quite robust to the set of CSE instrumental variables employed, particularly in the subsample (Table 10). This is consistent with the analysis in Staiger and Stock (1994) which suggests the two-step estimates should be less biased in this sample relative to the full sample.

The coefficient estimates for all single mothers (Table 9) imply that increasing child support income by $100 would decrease the average probability of AFDC participation of single mothers by 1.6 to 1.9 percentage points. This corresponds to 5.2% to 6.1% of the actual AFDC participation rate in the sample, which is 30.9%. Similarly, the estimates for the subsample of never-married and recently divorced single mothers imply that AFDC participation among this group would decline by 2.1 percentage points (or 6.2%), if child support income increased by $100.[48] To explore the implications of

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[46] The standard errors of the coefficients reported in Tables 9 and 10 have not yet been corrected to account for the two-step estimation procedure. This will be done as the work progresses.

[47] The finding that CSE variables have statistically significant effects on child support payments contrasts the mixed results obtained by Miller et. al. (1994). However, because they do not test the joint significance of their variables, employ different CSE measures, and examine a different sample of women, the source of the difference is not readily evident.

[48] In another paper, Nixon (1995a), I consider the cost to the government of increasing child support collections through expenditures on CSE. For the 1979-1991 period, I find that an additional $1 of spending increases CSE collections by approximately $1.93. However, I also find that the marginal collections increase for non-AFDC recipients is approximately 27 times more than the increase for non-AFDC single

my estimates slightly more detail, I also consider the effect of increasing child support payments to the full amount owed. On average, single mothers who have child support awards in place receive 63% of what they are owed. Using the estimates of the AFDC participation equation for all single mothers, I find that increasing the amount collected to 100% of what is due would reduce the average probability of AFDC participation from .309 to approximately .271. This is a decrease of 12% from its initial level. It should be noted that if there is no award, then no increase is received.

Examining the one-step Probit estimates of the effect of child support income on AFDC presented in the first column of Tables 9 and 10, we see that these estimates are substantially smaller in magnitude than the two-step estimates. Focusing on Table 9, we see that the one-step estimates suggest a 0.4 percentage point reduction in AFDC for a $100 increase in child support, while the two-step estimates imply a 1.6-1.9 percentage point reduction. The estimate jumps by a factor of 4-5. In addition, the coefficient estimates on the first-step residuals included in the second-step Probits, which provide an estimate of the correlation between the two error terms, are positive and statistically significant. In another application, Robins (1986) also found evidence of positive correlation between the error terms in child support income and AFDC equations.[49]

These results clearly suggest bias towards zero in the one-step Probit estimates of the effect of child support income on AFDC. There are several potential explanations for the large increase in the magnitude of the negative estimate in the two-step results. First, it is possible that the measurement error in child support is extensive and that conditions hold such that the measurement error bias in the one-step Probit estimates is towards zero. Appendix 3 explores the issue of measurement error bias in more detail using the two reports of 1989 child support income available in the 1990 CPS survey. That analysis suggests that measurement error is unlikely to explain all of the difference in the one-step vs. two-step estimates of the child support effect. A second possible

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mothers in the CSE system.

[49] Robins (1986) estimated this correlation as a part of correcting child support equations estimated separately by AFDC status for selection into AFDC.

explanation is that the net bias due to unobserved characteristics of the mother which are correlated with AFDC and child support, i.e. heterogeneity bias, is positive in sign.

The coefficient estimates for the other explanatory variables in the AFDC model are presented in Table 11, for the one-step Probit estimation and the two-step Probit which uses the collection rate and average collections as instruments. Since the coefficient estimates for the individual level variables in the one-step Probit are very similar to those discussed above for the reduced form AFDC equation, I will not repeat those findings here. In the two-step estimation, the residual from the first stage equation is included as a regressor. Because this variable is highly correlated with the other explanatory variables, the coefficient estimates on the individual characteristics are imprecise (standard errors are large). With the first stage residual included, the only variables which still have a statistically significant effect on AFDC participation are the number of children ages 0-5, the number of children ages 6-17, and age-squared.

The above estimates of the effect of child support income on AFDC provide insight into the expected change in AFDC participation for a given improvement in the child support situation of single mothers. This is a key parameter of interest to welfare policy makers. However, we may also be interested in determining how much of this overall change is due to behavioral changes and how much is simply a result of "mechanical" decreases in eligibility when child support income increases (Ashenfelter, 1983).[50] I obtain a rough estimate of the degree to which the estimated percentage point decline in AFDC participation, of approximately 1.7, associated with a $100 increase in child support is "mechanical" by computing the change in AFDC eligibility rates when child support income is increased by $100. To do this, I use the initial AFDC eligibility means test, which is having income below 185% of the state's AFDC "need standard" for the relevant family size. Making this calculation I find that when child support

---

[50] In Figure 1 a "mechanical" change can be seen along segment BD; when child support increases by CE, a woman along the BD segment of the budget set becomes ineligible for the AFDC program (her calculated welfare benefit no longer exceeds zero) and will automatically switch to non-AFDC status even holding everything else fixed. "Behavioral" decreases in participation correspond to a woman moving from segment AD to segment DE (or BD to the upper portion of DE). In this case, a change in behavior is associated with the change in AFDC status.

income increases by $100, the eligibility rate of single mothers based on this test declines by .12 percentage points, and the eligibility rate of those currently on AFDC declines by only .06 percentage points. This suggests that out of the total 1.7 percentage point decline, at least 1.58 points (or 93%) can be attributed to behavioral changes. The reason for such a small mechanical effect is that women on AFDC are well below the income eligibility level. In my sample, 95% of the AFDC recipients have incomes which are more than $2100 below this cutoff. These estimates of the mechanical effect are likely to be a lower bound, since I have only used the first AFDC eligibility test in my computation. In particular, an additional $100 of child support could result in ineligibility for benefits in one of the subsequent AFDC eligibility tests (e.g. calculated welfare benefit exceeds zero). Even taking this into account, it seems clear that the participation change is not primarily driven by mechanical eligibility changes.

7. Conclusions

This work provides new evidence on the effects of Child Support Enforcement on families in the United States. First, I find that increased CSE reduces the probability of marital dissolution. In other words, when CSE raises the financial responsibility of absent fathers to their children, it is less likely that married couples with children split up. Given the fact that CSE improves mothers' opportunities outside marriage, this finding suggests that the opposing effect of CSE on fathers is dominant. In the second part of my analysis, I provide direct estimates of the relationship between government CSE and AFDC participation. These results provide evidence that increased CSE reduces welfare participation rates. In addition, I offer new estimates of the effect of actual child support income on AFDC participation, which use cross-state variation in CSE to correct for measurement error and unobserved heterogeneity in reported child support. These latter estimates suggest that the potential for CSE to reduce welfare rolls may be larger than previously thought. Taken together, my results suggest that the realized effects of the Child Support Enforcement program are in line with the policy's goals. CSE is strengthening families and reducing welfare dependence.

From the perspective of both the general taxpayer and the policy maker seeking

to reduce child poverty and welfare costs, the above results provide support for pursuing Child Support Enforcement. The negative effect of CSE on AFDC participation reduces welfare costs directly. Since this effect is achieved by raising the income of single mother families, it is also expected to lower poverty and improve child outcomes in this population. The deterrent effect of CSE on divorce potentially has two indirect effects on poverty and welfare spending. First, by reducing the rate of entry into the AFDC eligible pool (single mothers), CSE may decrease current welfare participation. Second, by lowering the probability that children will spend part of their childhood in a single mother family, CSE may lower the probability of childhood poverty. This may in turn reduce welfare spending on the next generation through the links which have been established between childhood in a poor, single parent family and future welfare dependence. For these two indirect effects of CSE to actually occur, CSE must prevent divorce among women who are likely to be poor in the divorced state.

This paper addresses the effect of CSE on entry into single motherhood through marital break-up. However, there is a second key route to single motherhood, namely out-of-wedlock childbearing. In recent years, the percent of births to unmarried women has been steadily increasing. Given the high level of welfare receipt among never-married mothers, policies which affect childbearing of the never-married could potentially have a large effect on AFDC costs. Examining the impact of CSE on out-of-wedlock births would be a natural extension of the work presented here.

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FIGURE 1

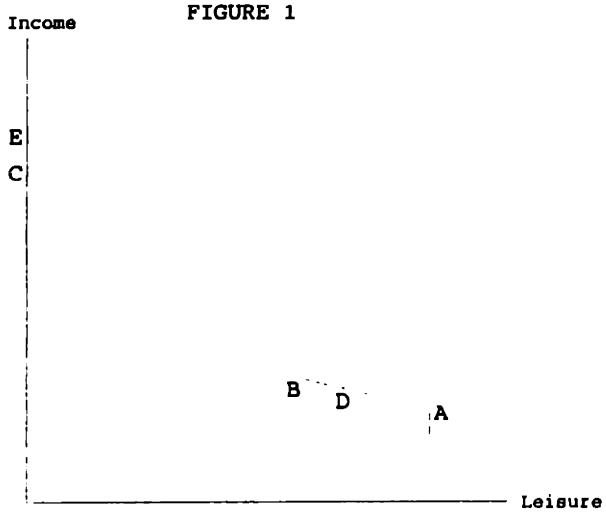

FIGURE 2

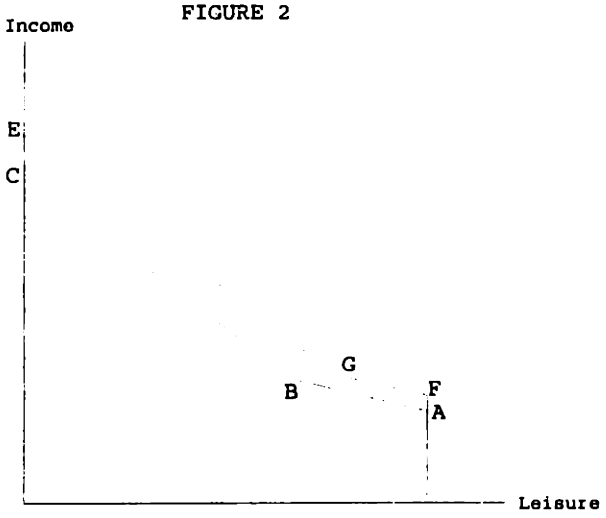

TABLE 1 - Variable Definitions

Outcome Measures:	
Divorced	1 if divorced/separated and breakup occurred in 5 years prior to survey, equal to 0 if currently married and never divorced.
AFDC	1 if received AFDC in previous year, 0 otherwise.
Individual Variables:	
Child Support	Amount of annual child support income received, real 1988 dollars.
Race	Indicator variables for Black and Other-nonwhite (omitted category: White).
Age, Age^2	Age in years & age-squared.
Education	Indicator variables for less than high school, some high school, high school graduate, some college (omitted category: college and beyond).
SMSA	1 if reside in SMSA, 0 otherwise.
Central City	1 if reside in central city, 0 otherwise.
Region	Indicator variables for eight Census regions (omitted region: nine).
Survey year	Indicator variable for 1990 survey (omitted year: 1988).
# Kids 0-5 yrs*	Number of children ages 0-5 years.
# Kids 6-17 yrs*	Number of children ages 6-17 years.
Never-married*	1 if never-married, equal to 0 if ever-married.
Child Support Enforcement:	
Collection Rate	Percent of cases with collection=(100)(# cases with collection)/(# cases).
Accts Receivable	Percent of owed support collected=(100)(amt collected)/(amt due).
Avg Collections	Average collections, normalized=(100)(collections/#cases)(1/median income).
Composite	Composite measure of CSE performance based on collection rate, average collections, order establishment rate (orders established per single parent families), and cost effectiveness (collections per $1 spent).
GPA	Grade point average for state CSE from U.S. House Ways and Means evaluation based on measures of paternity establishment, cost-effectiveness, accounts receivable, and AFDC cost reduction.
State Characteristics:	
Divorce Rate	Divorces per 1000 population (1980).
Percent Catholic	Percent of population that is Catholic (1980).
Per Capita Income	Per capita personal income, real 1988 dollars.
Avg Wage	Average wages in manufacturing, real 1988 dollars.
AFDC Benefits	Maximum AFDC benefits for family of four, real 1988 dollars.
Pop 18-44	Percent of population that is aged 18-44.
Pop 45-64	Percent of population that is aged 45-64.

*Note: These variables are not included in divorce equation.

TABLE 2 - Variable Means and Standard Deviations - Individual Data

Variable:	Divorce Main Sample [n=22212]	Divorce Control Group [n=18270]	AFDC Main Sample [n=5646]
Divorced	.119 (.323)	.097 (.296)	...
AFDC	...	...	.309 (.462)
Child Support (Real 1988 $1s)	...	...	946.162 (2313.950)
Black	.083 (.276)	.063 (.243)	.326 (.469)
Other-nonwhite	.048 (.213)	.034 (.181)	.038 (.191)
White	.869 (.337)	.903 (.296)	.636 (.481)
Age	34.758 (7.620)	45.974 (12.971)	32.219 (8.186)
Education: <9 yrs	.046 (.208)	.064 (.245)	.071 (.257)
Education: 9-11 yrs	.086 (.281)	.108 (.311)	.183 (.386)
Education: 12 yrs	.447 (.497)	.452 (.497)	.463 (.499)
Education: 13-15 yrs	.218 (.413)	.187 (.390)	.195 (.396)
Education: 16^{+} yrs	.203 (.402)	.189 (.392)	.088 (.284)
SMSA	.712 (.453)	.725 (.446)	.764 (.425)
Central city	.201 (.401)	.206 (.405)	.358 (.479)
Survey year=1990	.494 (.500)	.500 (.500)	.507 (.500)
Never-married	...	...	.332 (.486)
# Kids 0-5 yrs	...	...	.651 (.796)
# Kids 6-17 yrs	...	...	1.100 (.995)

TABLE 3 - Summary Statistics - State Data*

	Mean	Standard Deviation	Minimum	Maximum
CSE Variables:				
Collection Rate	17.60	8.04	4.13	37.63
Acct. Receivable	24.76	13.24	2.80	67.40
Avg. Collections	1.44	.68	.31	3.36
Composite	2.04	1.15	0.00	4.00
GPA	1.35	.49	.25	2.50
State Characteristics:				
Percent Catholic	19.40	12.96	1.62	64.70
Divorce Rate	5.69	2.23	2.90	17.30
Per Capita Income	15879.59	3350.49	10676.85	35397.66
Avg Wage	10.06	1.19	7.66	13.51
AFDC Benefits	5637.86	1868.75	1682.91	10292.10
Pop 18-44	43.55	1.91	38.39	50.66
Pop 45-64	18.22	1.64	12.78	21.28

TABLE 4 - Correlation Matrix for State CSE Variables*

	Collect Rate	Acct Rec.	Avg. Collect	Composite	GPA
Collect Rate	1.00	--	--	--	--
Acct. Rec.	.20	1.00	--	--	--
Avg. Collect	.86	.12	1.00	--	--
Composite	.84	.08	.86	1.00	--
GPA	.51	.31	.60	.65	1.00

*Notes to Tables 3 and 4:
Number of observations is 102 (50 states and D.C. over 2 years).
There are 89 observations in the tabulations involving the Accounts Receivable variable due to 13 missing values.

TABLE 5 - The Effect of CSE on the Probability of Divorce*

CSE Variable Included:	Main Sample (n=22212)	Control Group (n=18270)
Collection Rate	-.0036 (.0020) {-.0007}	.0001 (.0024) {.0000}
Accounts Receivable**	-.0032 (.0011) {-.0006}	-.0000 (.0013) {-.0000}
Average Collections	-.0593 (.0245) {-.0109}	-.0103 (.0297) {-.0016}
Composite	-.0313 (.0134) {-.0058}	-.0050 (.0162) {-.0008}
GPA	-.0756 (.0260) {-.0138}	.0161 (.0318) {.0026}

TABLE 6 - Main Sample: Predicted Effects of CSE on Divorce Rate

CSE Variable Included:	% Change in Mean P(div) for 1% Increase CSE	% Change in Mean P(div) for 1 Std. Dev. Increase CSE
Collect. Rate	-.10	-4.20
Acct. Rec.**	-.12	-6.67
Avg Collects	-.14	-6.72
Composite	-.10	-5.04
GPA	-.16	-5.88

*Notes to Tables 5:

Each box represents a different regression; i.e. CSE policy variables are entered individually. The dependent variable is equal to 1 if divorced/separated and breakup occurred in 5 years prior to survey, 0 if currently married and never divorced.

The other explanatory variables included are: black, other non-white, age, age-squared, four education level dummies, SMSA, central city, regions (8), survey year, and the state level controls listed in Table 1.

The equation is estimated by Maximum Likelihood Probit; standard errors are in parentheses. The mean change in the probability of divorce for a 1 unit change in CSE variable is in { }.

**Due to missing data for Accounts Receivable, the number of observations in these equations are: 20112 for the main sample, 15415 for the control group.

TABLE 7 -The Effect of CSE on the Probability of Divorce: Coefficients and Standard Errors

Explanatory Variable:	Main Sample [n=22212]	Control Group [n=18270]
Collection Rate	-.0036	.0001
	(.0020)	(.0024)
Percent Catholic	-.0046	-.0002
	(.0021)	(.0026)
Divorce Rate	.0217	.0220
	(.0088)	(.0100)
AFDC Benefits	.0252	.0098
	(.0104)	(.0128)
Per Capita Income	-.0142	.0090
	(.0090)	(.0110)
Avg Wage	.0372	.0505
	(.0155)	(.0190)
Pop 18-44	-.0180	-.0307
	(.0093)	(.0111)
Pop 45-64	.0356	-.0151
	(.0163)	(.0208)
Black	.4697	.2963
	(.0367)	(.0494)
Other-nonwhite	-.1459	-.2107
	(.0592)	(.0802)
Age	.0034	.1239
	(.0109)	(.0084)
$Age^2/100$	-.0248	-.1799
	(.0152)	(.0103)
Educ: <9 yrs	.3532	.2030
	(.0598)	(.0702)
Educ: 9-11 yrs	.5533	.2933
	(.0458)	(.0532)
Educ: 12 yrs	.3370	.1816
	(.0342)	(.0380)
Educ: 13-15 yrs	.2602	.2418
	(.0382)	(.0427)
SMSA	.0537	.0317
	(.0288)	(.0359)
Central city	.1370	.1567
	(.0297)	(.0346)
Year=90	.0562	-.0201
	(.0248)	(.0299)
Constant	-1.5589	-2.4176
	(.6280)	(.7591)
Regions	[8]	[8]
Log Likelihood	-7744.3091	-5286.7729
Mean Density	.187	.140

TABLE 8 - The Effect of CSE on the Probability of AFDC Participation*

	Dependent variable: AFDC			
CSE Variable Included:	Ever-Married & Never-Married	Ever-Married, Recent Transition	Ever-Married, Non-Recent Transition	Never-Married
Collection Rate	-.0074 (.0036) {-.0021}	-.0147 (.0060) {-.0036}	.0077 (.0079) {.0018}	-.0099 (.0056) {-.0034}
Accounts Receivable**	-.0028 (.0019) {-.0008}	-.0054 (.0033) {-.0013}	-.0079 (.0041) {-.0018}	.0013 (.0029) {.0004}
Average Collections	-.0676 (.0432) {-.0189}	-.1685 (.0719) {-.0397}	.1642 (.0967) {.0406}	-.1056 (.0680) {-.0357}
Composite	-.0455 (.0232) {-.0128}	-.0688 (.0392) {-.0168}	.0646 (.0528) {.0155}	-.0829 (.0361) {-.0280}
GPA	-.0704 (.0452) {-.0200}	-.0522 (.0765) {-.0128}	-.0147 (.1000) {-.0035}	-.1097 (.0705) {-.0370}
Mean(AFDC)	.3085	.2285	.2176	.4450
Observations	5646	2131	1360	2155

*Notes to Table 8:
Each box represents a different regression; i.e. CSE policy variables are entered individually.
The dependent variable is equal to 1 if received AFDC, 0 otherwise.
The other explanatory variables included are: never-married, number of children ages 0-5 and ages 6-17, black, other non-white, age, age-squared, 4 education level dummies, SMSA, central city, region (8), survey year dummy, and the state level controls listed in Table 1.
The equation is estimated by Maximum Likelihood Probit, standard errors in parentheses.
The mean change in the probability of divorce for a 1 unit change in the CSE variable is in {}.

** Due to missing data for Accounts Receivable, the number of observations in these equations are: 5166, 1946, 1248, 1972 (from left to right).

TABLE 9 - The Effect of Child Support Income on AFDC: All Single Mothers*

Method->	One step	Two step (1)	Two step (2)	Two step (3)	Two step (4)
Instruments->	NONE	Collect Rate Avg Collect	Collect Rate Avg Collect Composite	Collect Rate Avg Collect GPA	Collect Rate Avg Collect Comp., GPA
Child Supp. in $100s	-.0134 (.0017) {-.0038}	-.0681 (.0300) {-.0188}	-.0631 (.0297) {-.0175}	-.0646 (.0278) {-.0179}	-.0564 (.0268) {-.0157}
Residual from 1st Step	...	.0547 (.0300)	.0497 (.0297)	.0513 (.0278)	.0431 (.0268)
log-likelihood	-2804.59	-2802.93	-2803.18	-2802.88	-2803.29
F-test Inst. 1st Stage	...	3.28 [.0378]	2.19 [.0874]	2.60 [.0580]	2.03 [.0870]

TABLE 10 - The Effect of Child Support Income on AFDC: Recently Divorced and Never-married*

Method->	One step	Two step (1)	Two step (2)	Two step (3)	Two step (4)
Instruments->		Collect Rate Avg Collect	Collect Rate Avg Collect Composite	Collect Rate Avg Collect GPA	Collect Rate Avg Collect Comp., GPA
Child Supp. in $100s	-.0132 (.0020) {-.0039}	-.0726 (.0234) {-.0210}	-.0724 (.0234) {-.0210}	-.0731 (.0234) {-.0212}	-.0734 (.0234) {-.0213}
Residual from 1st Step	...	.0596 (.0234)	.0594 (.0234)	.0601 (.0234)	.0604 (.0234)
log-likelihood	-2227.56	-2224.31	-2224.32	-2224.24	-2224.197
F-test Inst. 1st Stage	...	5.34 [.0048]	3.75 [.0105]	3.66 [.0119]	2.82 [.0239]

*Notes to Tables 9 and 10:

The dependent variable is equal to 1 if received AFDC, 0 otherwise. The mean of AFDC is .309 in the Table 9 sample (# Obs=5646), and the mean is .337 in the Table 10 sample (# Obs=4286).

The other explanatory variables included are: never-married, number of children ages 0-5 and ages 6-17, black, other non-white, age, age-squared, 4 education level dummies, SMSA, central city, region (8), survey year dummy, and the state level controls listed in Table 1.

The equation is estimated by Maximum Likelihood Probit. In the two-step estimates, the residual from the first stage child support equation is included as an additional regressor. Standard errors are in parentheses (). They have not yet been corrected for the presence of an estimated regressor in the second step.

For child support income, the mean change in the probability of AFDC participation for a one unit change in child support ($100) is presented in {}.

The last row in each table provides the results of an F-test for the joint significance of the CSE variables included in the first stage equation. The p-value is in [].

TABLE 11 - The Effect of CSE and Child Support Income on AFDC - All Coefficients*
Sample: All Single Mothers (N=5646)

(This table continues on the next page.)

	Dependent Variable: AFDC		
	Reduced Form	One-Step	Two-Step
Collection Rate	-.0074	...	...
	(.0036)		
Child Support Income	...	-.0134	-.0681
($100s)		(.0017)	(.0301)
1st stage residuals	...	...	.0547
			(.0301)
Percent Catholic	.0354	.1571	-.0871
	(.3604)	(.3594)	(.3838)
Divorce Rate	-.0434	-.0391	-.0443
	(.0167)	(.0167)	(.0171)
AFDC Benefits	.0333	.0269	.0189
	(.0185)	(.0183)	(.0188)
Per Capita Income	-.0188	-.0170	-.0048
	(.0157)	(.0158)	(.0171)
Avg Wage	.0856	.0758	.0544
	(.0270)	(.0269)	(.0294)
Pop 18-44	-.0132	-.0071	-.0106
	(.0169)	(.0170)	(.0171)
Pop 45-64	-.0012	-.0036	-.0093
	(.0292)	(.0295)	(.0297)
Never-married	.3414	.2788	-.0037
	(.0477)	(.0481)	(.1627)
# Kids 0-5 yrs	.3943	.3958	.4054
	(.0291)	(.0292)	(.0297)
# Kids 6-17 yrs	.2321	.2433	.3360
	(.0236)	(.0238)	(.0563)
Black	.2389	.1934	-.1497
	(.0496)	(.0500)	(.1951)
Other-nonwhite	.1896	.1612	-.0630
	(.0998)	(.1000)	(.1588)
Age	.0144	.0163	.0258
	(.0177)	(.0177)	(.0185)
$Age^2/100$	-.0460	-.0473	-.0502
	(.0250)	(.0249)	(.0250)
Educ: <9 yrs	1.6026	1.4980	.4926
	(.1258)	(.1287)	(.5674)
Educ: 9-11 yrs	1.3897	1.3047	.4139
	(.1145)	(.1173)	(.5034)
Educ: 12 yrs	.9458	.8858	.1626
	(.1087)	(.1115)	(.4129)

Educ: 13-15 yrs	.7938	.7595	.1978
	(.1139)	(.1167)	(.3300)
SMSA	-.2797	-.2638	-.1122
	(.0534)	(.0588)	(.0992)
Central City	.2276	.2155	.0951
	(.0477)	(.0480)	(.0818)
Survey Year=90	.0072	-.0095	-.0826
	(.0426)	(.0423)	(.0584)
Constant	-1.8937	-2.0682	-.7526
	(1.'418)	(1.1497)	(1.3619)
Regions	[8]	[8]	[8]
Log-likelihood	-2842.6572	-2804.5922	-2802.9315
Mean density	.3287	.3221	.3220

*Notes:
The dependent variable is equal to 1 if received AFDC, 0 otherwise.
The instrumental variables for child support in the Two Step Probit are: Collection Rate and Average Collections.
Each equation is estimated by Maximum Likelihood Probit. In the two-step estimates, the residual from the first stage child support equation is included as an additional regressor.

Appendix 1 - Sample Selection Specification Checks

To address potential sample selection bias issues, this appendix reports estimates of the divorce equation and the reduced form AFDC participation equation as applied to broad samples of women. In both cases, these additional estimates are designed to check whether the negative effects of CSE on divorce and AFDC participation obtained for the samples of interest (Tables 5 and 8) reflect actual negative effects of CSE on these outcomes. The possibility addressed here is that these negative coefficient estimates are picking up the effect of CSE on selection into these samples. In other words, where CSE is high the type of woman who makes it into the divorce (AFDC) sample is a priori unlikely to divorce (participate in AFDC).

The main sample I use in the divorce analysis consists of ever-married mothers with children under age 18 who are either (a) currently married and have never divorced or (b) currently divorced/separated and have recently experienced marital dissolution. Given the definition of this sample, potential selection bias issues arise along several lines including remarriage, childbearing, and first marriage. For example, it is possible that where CSE is strong, the only couples who have children and/or who become married in the first place are "stable" types with respect to marriage, i.e. they are the type unlikely to divorce. In both of these cases, the CSE variable in the divorce equation estimated on the "main sample" defined above would pick up the effect of the unobserved "stable" characteristic and the coefficient on the CSE variable would be negatively biased. To address these possible biases, I re-estimate the divorce equation on three broader samples: (1) all ever-married mothers, (2) all ever-married women, and (3) all women. In each estimation the dependent variable remains equal to 1 for women with children under 18 who are currently divorced/separated and recently experienced marital dissolution, and it is equal to 0 otherwise. In line with the method used for the "main sample," I estimate five equations for these three samples each including a different measure of CSE. The estimates of these three sets of equations along with estimates for the main sample are presented in Table A1.1.

The conclusion I draw from these results is that the negative estimates obtained for the "main sample" are not sensitive to the criteria used to define this sample. In Table A1.1 every CSE coefficient estimate in each of the four samples considered is negative in sign and statistically significant. Even after allowing for all other alternatives (the sample of all women), I find a negative effect of CSE on the probability of being a recently divorced single mother. The predicted change in the average probability of divorce for a one unit change in CSE becomes smaller in absolute magnitude as the samples broaden, but this is expected since CSE should have zero effect on the probability of divorce for an increasingly larger fraction of the sample. These estimates consistently demonstrate that the negative effect of CSE on the probability of becoming a divorced single mother is robust to sample definition.

The sample I use in the AFDC analysis presented in the paper consists of single mothers with children under age 18 from an absent father. In this case, the exclusions of remarried women, married mothers, and women without children (under 18) could potentially cause selection bias. For example, it is possible that where CSE is strong the women who become single mothers (through divorce or out-of-wedlock childbearing) are the types of women who are a priori unlikely to be on AFDC (e.g. the "Murphy Brown" type). In this case, the estimated negative effects of CSE on AFDC participation would merely reflect the fact where CSE is high the women who make it into the single mother sample are those unlikely to take-up AFDC. To test the sensitivity of my results to the exclusions made in defining my sample, I re-estimate the reduced form AFDC participation equation on three broader samples: (1) all women with children under 18, (2) all single women, and (3) all women. In each estimation the dependent variable remains equal to 1 for those women who are single with children under 18 from an absent father and received AFDC in the past year, and it is equal to 0 otherwise. In these equations, I drop the variables for the number of children and never-married status since childbearing and marital status are now treated as endogenous. Again, I estimate five equations for each of the four samples, each including a different measure of CSE. The estimates of these three sets of equations and estimates for the single mother sample are presented in Columns 1-4 of Table A1.2. In line with the estimates for the broader samples, the estimates for the single mother sample in Table A1.2 exclude the number of children and never-married variables and therefore differ from those in Table 8.

In every sample and for every CSE variable, the results indicate a statistically significant negative effect of CSE on the probability of being a single mother on AFDC. As for divorce, the predicted change in the average probability of AFDC for a one unit change in CSE becomes smaller in absolute magnitude as the samples, but this is again expected since CSE should be having zero effect on the probability of AFDC for an increasingly larger fraction of the sample. The conclusion I draw from these AFDC participation specification checks is that the negative estimates obtained for the sample of single mothers are not sensitive to the criteria used to define the sample.

TABLE A1.1 - Divorce: Sample Selection Specification Checks, Probit*

	Main Sample	All Ever-Married Mothers	All Ever-Married Women	All Women
Collect Rate	-.0036 (.0020) {-.0007}	-.0031 (.0019) {-.0005}	-.0033 (.0018) {-.0003}	-.0030 (.0017) {-.0002}
Acct Receive	-.0032 (.0011) {-.0006}	-.0032 (.0010) {-.0005}	-.0030 (.0009) {-.0003}	-.0027 (.0009) {-.0002}
Avg Collect	-.0593 (.0245) {-.0109}	-.0559 (.0233) {-.0087}	-.0550 (.0217) {-.0048}	-.0475 (.0206) {-.0035}
Composite	-.0313 (.0134) {-.0058}	-.0292 (.0127) {-.0046}	-.0311 (.0118) {-.0028}	-.0268 (.0111) {-.0020}
GPA	-.0756 (.0260) {-.0138}	-.0745 (.0247) {-.0112}	-.0757 (.0229) {-.0065}	-.0632 (.0217) {-.0046}
Mean(Divorce)	.0119	.0936	.0479	.0378
# Observations	22212	28145	54977	69622

TABLE A1.2 - AFDC: Reduced Form Sample Selection Specification Checks, Probit*

	Single Mothers	All Mothers	All Single Women	All Women
Collect Rate	-.0084 (.0035) {-.0025}	-.0073 (.0024) {-.0008}	-.0080 (.0025) {-.0009}	-.0073 (.0021) {-.0004}
Acct Receive	-.0036 (.0018) {-.0011}	-.0040 (.0013) {-.0004}	-.0035 (.0013) {-.0004}	-.0036 (.0011) {-.0002}
Avg Collect	-.0840 (.0424) {-.0246}	-.1009 (.0283) {-.0097}	-.0907 (.0295) {-.0097}	-.0880 (.0250) {-.0044}
Composite	-.0540 (.0228) {-.0159}	-.0558 (.0153) {-.0055}	-.0570 (.0159) {-.0062}	-.0530 (.0135) {-.0027}
GPA	-.0906 (.0443) {-.0265}	-.1180 (.0299) {-.0113}	-.1123 (.0310) {-.0118}	-.1138 (.0263) {-.0055}
Mean(AFDC)	.3085	.0652	.0746	.0289
# Observations	5646	29652	26554	69622

* See notes accompanying Table 5 (for A1.1) and Table 8 (for A1.2).

Appendix 2 - Two Step Probit

Newey (1987) presents a two step estimation method for limited dependent variable models with endogenous explanatory variables (also outlined in Smith and Blundell (1986) for Tobit and Rivers and Vuong (1988) for Probit), such as the AFDC participation model in this paper. This appendix gives a brief description of the method as applied here. Subscripts have been dropped to simplify notation. The AFDC participation model is written as:

$$\text{(a1)} \quad a^* = C\gamma_1 + X\gamma_2 + S\gamma_3 + v$$
$$a^* = C\gamma_1 + Z_1\Pi_1 + v,$$

where a* represents the utility gain to participation, C represents child support income and is assumed to be endogenous, X is the vector of individual level characteristics, S is the vector of state level control variables, and the variables in $Z_1=[X, S]$ are all assumed to be exogenous. We then assume that the endogenous variable, C, is a function of a set of instrumental variables:

$$\text{(a2)} \quad C = Z_1\Pi_1 + E\Pi_2 + w$$
$$C = Z\Pi + w$$

where $Z=[Z_1, E]$, $\Pi=[\Pi_1' , \Pi_2']'$, Z_1 is the vector of instrumental variables included in equation (a1), and E is the vector of instrumental variables excluded from equation (a1). In this application, the excluded instrumental variables, E, consist of Child Support Enforcement measures.

Under the assumption that, conditional on Z, the error terms in equations (a1) and (a2) are multivariate normal:

$$\text{(a3)} \quad (v, w) \sim N (0, \Sigma),$$

it then follows that the conditional density of v given C is:

$$\text{(a4)} \quad v \sim N (w\rho , \sigma^2)$$

where $\rho = \Sigma_{22}^{-1}\Sigma_{21}$ and $\sigma^2=\Sigma_{11}-\Sigma_{12}\Sigma_{22}^{-1}\Sigma_{21}$. Finally, the conditional density a* given C is characterized by:

$$\text{(a5)} \quad a^* \sim N (C\gamma_1 + Z_1\Pi_1 + w\rho, \sigma^2).$$

The variable a* is unobserved. Instead, we observe an indicator variable, a, for AFDC participation where:

(a6) $a=1$ if $a^*>0$
$a=0$ if $a^*\leq 0$.

The conditional log-likelihood function for the observed AFDC participation variable, a, conditional on C, can then be written as:

(a7) $\ln L = (a)\Phi(D\Gamma + w\rho) + (1-a)[1-\Phi(D\Gamma + w\rho)]$
$\ln L = (a)\Phi(D\Gamma + (C-Z\Pi)\rho) + (1-a)[1-\Phi(D\Gamma + (C-Z\Pi)\rho)]$,

where $D=[C, Z_1]$, $\Gamma=[\gamma_1', \Pi_1']'$, $\Phi(.)$ is the standard normal density and σ^2 is normalized to one.

To estimate Γ, a two-step procedure is used. In the first step, OLS estimates of Π are obtained by regressing C on W. In the second step, these OLS estimates, Π^*, are then substituted into equation (a7) to yield:

(a8) $\ln L = (a)\Phi[D\Gamma + (C-Z\Pi^*)\rho] + (1-a)[1-\Phi(D\Gamma +(C-Z\Pi^*)\rho)]$.
$\ln L = (a)\Phi[D\Gamma + (w^*)\rho] + (1-a)[1-\Phi(D\Gamma +(w^*)\rho)]$.

In other words, the residuals from the first step, $w^*=C-Z\Pi^*$, are included as an additional regressor in the AFDC probit model. Consistent estimates of Γ and ρ are obtained by maximum likelihood Probit estimation of (a8).

Appendix 3 - Measurement Error in Reported Child Support

This appendix examines the bias induced by measurement error in child support income. In particular, I use the two reports of 1989 child support income available in the 1990 CPS April/March match file to obtain estimates of the effect of child support on AFDC participation which are corrected for measurement error. Because I am restricted to individuals surveyed in 1990, the sample consists of 2,861 single mothers.

The classic measurement error equations strictly hold only for the linear bivariate case. Therefore, I will focus my attention on such models in this analysis. (In the multivariate linear case and/or the nonlinear case, the equations for measurement error bias become much more complex, and I do not have sufficient information in the data to identify the parameters of interest.) Assuming that we can express AFDC participation, a, as a linear function of annual child support income, c*, we have:

$$[1] \qquad a = Bc^* + e,$$

where a denotes AFDC participation, c* denotes actual child support income (annual), B is the true coefficient on actual child support income, and e is the error term. In the analysis that follows, orthogonality is assumed (i.e. $E[c^*e]=0$).

As documented in Section 4.4 of this chapter, there is evidence that actual child support income, c*, is reported with error in the CPS data. Formalizing this, we have:

$$[2] \qquad c_t = c^* + v_t,$$

where c_t is 1989 child support income reported in month t, t=A (April) or M (March), and v is the measurement error, or the difference between actual and reported child support income. Writing equation [1] in terms of the observed variables, a and c_t, we then have:

$$[3] \qquad a = Bc_t + (e - Bv_t).$$

Under the standard set of measurement error assumptions (i.e. that e, v_t, and c* are mutually independent), we obtain the classic result:

$$[4] \qquad \text{plim } b = B\,(1 - (\sigma_{vt}^2/\sigma_{ct}^2)) = B\,(\sigma_{c^*}^2/\sigma_{ct}^2) = B\lambda.$$

In equation [4], b denotes the estimate of the coefficient, B, based on OLS estimation of equation [3], and λ denotes the ratio of the variance of actual child support income to the variance of reported child support income. From equation [4], it is clear that the larger the degree of measurement error in reported child support, the smaller is λ, and the closer b is to zero.

Given the set of assumptions made above, the March report of 1989 annual child support income satisfies the requirements necessary to be a valid instrument for the April report and vice versa. In particular, c_M is highly correlated with c_A, and c_M is uncorrelated with e; likewise, c_A is highly correlated with c_M, and c_A is uncorrelated with e. Therefore, two instrumental variable (IV) estimates of the effect of child support income on AFDC participation, which correct for the measurement error bias, can be obtained by using each of two reports of 1989 child support income as an instrument for the other.

Using the April report as the child support variable in equation [3] and using the March report as the instrument, we obtain the following OLS and IV estimates:

	Coeff.	Std Err.	Instrument
OLS	-0.0043	(0.0004)	....
IV	-0.0082	(0.0007)	c_M

Based on these two estimates, the ratio of the variance of actual child support to the variance of reported child support, λ, is estimated to be .52.

Alternatively, if we use the March report in equation [3] and use the April report as the instrument, we obtain:

	Coeff.	Std Err.	Instrument
OLS	-0.0051	(0.0004)	....
IV	-0.0067	(0.0007)	c_A

Based on these two estimates, we have $\lambda = .76$.

The uncorrected OLS estimates of equation [3] suggest that an additional $100 of child support income reduces the probability of AFDC participation by approximately 0.4-0.5 percentage points. Although these estimates are based on a simplified model and use only the 1990 data, they are quite comparable to the multivariate one-step Probit estimates obtained in the paper, which imply a 0.38 percentage point reduction in AFDC participation for a $100 increase in child support income.

As expected in the presence of measurement error, the IV estimates of the effect of child support income in equation [3] are larger in magnitude than the corresponding OLS estimates. In particular, the IV estimates of [3] suggest that an additional $100 of child support income reduces the probability of AFDC participation by approximately 0.7-0.8 percentage points and that 52-76% of the variance in reported child support is accounted for by the variance in the true child support amount. In this linear, bivariate AFDC model, IV estimates of the effect of child support which correct for measurement error exceed the uncorrected (OLS) estimates by a factor of 1.3-1.9. In the multivariate Probit model estimated in the paper with 1988 and 1990 data, two-step estimates, which

employ state CSE variables as instruments for child support, exceed the uncorrected one-step estimates by a factor of approximately 4-5. While we must be cautious in making comparisons given the differences between these two statistical models, the analysis in this Appendix provides suggestive evidence that measurement error is unlikely to explain all of the difference between the one-step and two-step Probit estimates.

CHAPTER 3

Child Support Awards and Marital Status: Does "One Size Fits All" Apply to Enforcement Policy?

1. Introduction

Child support enforcement has emerged as an important public policy concern in the United States in recent years, and this issue is central to many of the current political proposals and debates regarding the welfare system. The relevance of child support to the nation at this time rests on the simple fact that a large and increasing number of children in the U.S. are eligible for child support. In 1990, there were approximately 10 million women in the U.S. with children from an absent father (U.S. DHHS, 1992). Recent statistics indicate that 1.5 million children (about 1 in 40) experience the divorce of their parents annually, and nearly 30% of births are to unmarried women (Haveman and Wolfe (1994)). While the divorce rate has leveled off in recent years, the percent of out-of-wedlock births continues to rise increasing the fraction of children in need of child support. At the same time, "deadbeat dads" are a common phenomenon. In 1989, only 37% of mothers eligible for child support received any payments (U.S. House of Representatives, 1992). The added fact that many single mothers who do not receive child support rely on government welfare programs has brought child support enforcement into the welfare reform debate.

There are three key pieces of federal legislation which have shaped the child support policy environment which exists today. In 1975, Title IV-D of the Social Security Act was passed officially enacting the Child Support Enforcement (CSE) program. This law created the federal Office of Child Support Enforcement (OCSE) and required each state to establish a CSE agency to administer the program. The role of the federal OCSE is to set standards and policy, monitor and evaluate state agencies, and share in the financing of the program. The Child Support Enforcement Amendments passed by Congress in 1984 and the Family Support Act passed in 1988 each required state governments to enact a set of laws related to child support. These include wage withholding of child support payments, allowing paternity establishment until the child's 18th birthday, and required use of mathematical guidelines in determining child support award levels. Making use of the existing laws and policies, the state CSE agencies provide assistance to parents seeking child support. Any family with a child from an absent parent is eligible to receive CSE program services, and participation is required

of families receiving welfare. The CSE agencies assist families with all aspects of child support enforcement including paternity establishment, absent parent location, establishment of awards, and enforcement of existing awards. In 1992, the government spent $1.99 billion on the CSE program to collect a total of $7.96 billion in child support (U.S. Department of Health and Human Services (DHHS), 1992).

With the growing political and public interest in child support, a number of economists have begun to explore the determinants of child support outcomes and the effects of government CSE efforts.[1] This paper extends that line of research by considering heterogeneity within the population of women eligible for child support, focusing particularly on marital status differences.[2] Since father absence determines eligibility for child support, eligible mothers may be of four marital status types: never-married, separated, divorced, or remarried. Each of these situations is potentially quite different with respect to securing child support from the absent father. The primary contribution of this work is to explore how the government CSE program affects the child support award rates of women in these four groups.

Allowing for differences in policy effects across clearly identifiable subgroups of the population served by CSE can provide useful information to policy makers along several lines. First, if we find that differences do exist, this calls for caution in drawing inferences from policy evaluations that have treated all custodial mothers alike. Second, group specific analysis is helpful in evaluating policy efforts targeted towards particular subgroups, such as raising the award rates of never-married mothers through increased paternity establishment. Finally, understanding the nature and extent of between group differences in returns to policy efforts can help policy makers determine how to target efforts to achieve their objectives most efficiently.

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[1] Several very recent examples are Beller and Graham (1993), Garfinkel and Robins (1994), Miller, Garfinkel and McLanahan (1994), and Argys, Waldman, and Peters (1995). More discussion of this research is provided in Section 2 and additional references are listed in the Bibliography.

[2] While it is possible for the absent parent to be the father or mother, my discussion throughout the paper refers to the absent parent as the father and the custodial parent (with whom the child lives) as the mother. This is the predominant situation and, in addition, the child support data is only collected from mothers with children from an absent father.

The empirical analysis uses Current Population Survey (CPS) Child Support Supplement data and CSE program data for the 1978-1989 period. To motivate the focus on award rates and marital status variations in CSE effects, I first document the marital status differences in child support outcomes during the 1978-1989 period. Descriptive statistics provide relatively strong evidence that the large differences in average child support payments by marital status originate with the first step towards securing child support: the establishment of a child support award. Turning to the empirical analysis of award probability equations, I show that pooling the four marital status groups masks considerable between group heterogeneity in the effects of individual, state, and CSE program characteristics on award probabilities. Tests for the restriction of equal coefficients across the subgroups are strongly rejected. The positive effect of CSE on award rates observed in the full sample appears to be driven by strong CSE effects for separated and never-married mothers. In contrast, there is no evidence of CSE effects on the award rates of ever-divorced (divorced or remarried) mothers. The fact that never-married and separated mothers are likely to have higher direct contact with CSE as a result of their high AFDC participation rates may be contributing to this result. Estimates of the effect of CSE in other demographic groups with relatively high AFDC recipiency, such as non-white and less educated mothers, provide empirical support for this hypothesis.

The remainder of the paper is organized as follows. Section 2 briefly discusses the previous literature and contributions of this paper. Section 3 presents the analytical framework for the empirical analysis of child support award rates. Section 4 includes descriptions of the data used in the empirical analysis and summary statistics. Section 5 presents the empirical analysis and results. Section 6 concludes.

2. Previous Literature and Contributions

The previous economic research relevant to this study falls into two main categories. First, Beller and Graham (1986b, 1993) have given some attention to marital status differences in child support outcomes. Their work focuses primarily on decomposing these differences into the portion that can be explained by differences in

socioeconomic characteristics and that which remains unexplained. In general, they find that relatively little of the never-married vs. ever-married variation in outcomes can be explained by differences in observable characteristics of these groups. The second set of relevant research consists of studies which examine the effects of Child Support Enforcement. In another work (Nixon, 1995a), I examine the effect of CSE spending on CSE program collections at the state level. That analysis reveals large differences in the effects of CSE expenditures on child support collections between the AFDC and non-AFDC caseloads, with a much higher collections return for the non-AFDC group. Given the large differences in AFDC participation rates by marital status, this result is relevant to the present study, and I return to it in the conclusion of this paper. Perhaps most closely related to the work presented here are three recent studies (Beller and Graham (1993), Garfinkel and Robins (1994), and Miller et. al. (1994)), which use the CPS Child Support Supplement data to examine the effects of state level CSE policy variables on child support outcomes of individual mothers. Overall, these studies find mixed evidence regarding the effects of CSE policy efforts.

The central contribution of this paper is to bring together these two strands of research in a unified analysis of marital status differences and CSE policy effects. The previous work on marital status differences cited above has not focused on CSE effects, while the previous work considering CSE effects on child support outcomes has given relatively little attention to marital status differences in these effects.[3] It is my goal to begin to fill this gap. Examining the extent and nature of differences in the effects of CSE for demographically identifiable subgroups of the custodial mother population may provide valuable information for evaluating the effects of current CSE policies and making recommendations for future policy directions.

In this effort, I also consider a more detailed breakdown of marital status than has been used in past research. Previous examination of marital status differences has been

[3] There has been some movement in this direction in the most recent work on CSE policy effects. In particular, Miller et. al (1994) include interaction terms between never-married status and several policy variables, and Beller and Graham (1993) and Argys et. al. (1995) estimate several equations separately for never-married women. However, this issue is not the focus of any prior study.

restricted to the ever-married vs. never-married distinction. Here, I also consider the three subgroups of ever-married mothers with children from an absent father: separated, divorced, and remarried. Analysis of policy effects by this detailed marital status breakdown may shed light on some of the findings of previous work, which has been less disaggregated.

3. Analytical Framework

To understand marital status differences in child support outcomes and to target policy efforts successfully, it is useful to decompose child support payments into a several intermediate outcomes (Garfinkel and Robins (1994), Miller et. al. (1994)). In particular, expected child support income is the product of the expected award level and the degree of compliance with that award. We can further decompose the expected award level into the probability of having an award and the expected amount of the award given that an award is made. More formally, we can write the representative mother's expected child support income as:

$$(1) \qquad E(C) = P(A)*E(D|A=1)*E(T|A=1),$$

where C denotes dollars of child support received, A denotes the existence of an award (A=1 indicates an award), D denotes the dollar value of the child support award, T denotes the compliance rate or the percent of the award which is paid, P denotes probability, and E is the expectations operator.

In this paper, I examine the probability of having a child support award, which is the necessary first step in the process of securing child support payments. To model the award probability, I basically follow the previous child support literature (see Beller and Graham (1986a, 1986b, 1988, 1993), Teachman (1991), Beron (1990a, 1990b)) and express this probability as a function of the absent father's ability to pay (F_a), his desire or willingness to pay (F_d), the mother's costs (M_c) and benefits (M_b) of obtaining support, and the Child Support Enforcement environment (E):

(2) $$A = f(F_a, F_d, M_b, M_c, E, \epsilon),$$

where ϵ is a random disturbance (error term). CSE (E) is expected to have a direct effect on the award rate of mothers who use CSE program services. In addition, measures of CSE are expected to affect the award rates of custodial mothers both inside and outside the CSE system indirectly through effects on the mother's costs and benefits to seeking support and the father's willingness to pay (his costs of non-payment).

To implement this model, I assume that the first four arguments in the award function shown in (2) are determined by individual characteristics of the father (X_f), individual characteristics of the custodial mother (X_m), characteristics of the custodial family (X_c), and the Child Support Enforcement environment (E). This yields a reduced form equation for the award probability:

(3) $$A = f(X_f, X_m, X_c, E, \epsilon).$$

Unfortunately, father characteristics (X_f) are not observed in the available data. Given this limitation, I proxy the father's ability and willingness to pay by characteristics of the mother (X_m), the custodial family (X_c), and several state level variables (S_1). Characteristics of the mother are used under the assumption of positive assortative mating (Becker (1981)), which says that individuals marry people of similar characteristics.[4] Substituting into (3), we have:

(4) $$A = f(X_m, X_c, S_1, E, \epsilon),$$

which expresses the award probability in terms of observable variables.

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[4] Blackburn and Bloom (1994) provide evidence that husbands and wives do have similar characteristics. In 1987, the correlation of husbands' and wives' ages was .91, the correlation of years of education was .65, and the correlation of predicted employment status was .84.

4. Data and Descriptive Statistics

4.1 CPS Data

The individual level data used in this analysis comes from the Current Population Survey (CPS) Child Support Supplements of 1979, 1982, 1984, 1986, 1988, and 1990. These surveys are conducted by the Bureau of the Census and sponsored by the federal Office of Child Support Enforcement. Each Child Support Supplement is linked to the March CPS annual demographic and income data. The Supplement consists a series of questions regarding child support awards and receipts during the previous calendar year. Therefore, in speaking of child support outcomes I refer to the years 1978, 1981, 1983, 1985, 1987, and 1989 respectively.

The CPS Child Support Supplements have a number of strengths and weaknesses, which have been discussed in detail by Beller and Graham (1993) and Robins (1987, 1989). Here, I highlight only those issues particularly relevant to the present study. One key advantage of this data is that each Child Support Supplement survey provides a large nationally representative cross-section of mothers eligible for child support. When linked together, the series of surveys yields a large enough data set to examine demographic subgroups of custodial mothers, such as the marital status groups considered here. For the purpose of my analysis, the basic problem with this data is the lack of information on the absent father, who indisputably plays a primary role in the determination of child support outcomes.[5] As noted above, this is addressed by proxying for father characteristics with other observable variables.

Another drawback is that the Child Support Supplements do not accurately sample the population eligible for child support. In particular, the design of the screening questions for the Supplement interview result in both the exclusion of some women who are actually eligible for child support and the inclusion of some women who are ineligible. This issue has been discussed in detail by Robins (1987) and Graham and Beller (1993). To summarize, the "included ineligibles" are primarily older women living

[5] Some effort to address this was made in the 1988 and 1990 CPS surveys which asked mothers about the father's location and frequency of visitation with the children.

with their own child(ren) over 21 from an absent father and some other household member under 21, and the "excluded eligibles" are primarily women in their first marriage who have a child eligible for support from an out-of-wedlock birth prior to the marriage. To address the "included ineligibles" problem, I follow Beller and Graham (1993) and exclude all women over the age of 65 and all ever-married women who report their most recent divorce or separation as more than 21 years prior to the survey.[6]

Besides the exclusion of these older women, the one additional modification I make is to re-classify from "widowed" to "divorced" the 125 women whose current marital status is "widowed" but who have children from a previous divorce. With the above exclusion and reclassification, the sample analyzed below consists of 23,859 mothers eligible for child support.[7] By marital status, there are 5,456 never-married, 3660 separated, 8,310 divorced, and 6,433 remarried mothers. The remarried women included in the sample are eligible for child support by virtue of having a child from the

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[6] A less conservative strategy I considered is to use the information on child ages from the March CPS family record to screen out women with no child under 18 present. This is also discussed by Beller and Graham (1993) and is related to the approach taken by Robins (1987, 1989). Since child support eligibility often ends at age 18, this seems like a reasonable approach. However, there are several concerns. First, approximately 10.5% of the child support supplement sample would be deleted using this criteria. In addition, among the cases with zero children under 18 according to the family record, 49% report ever having an award and 30% report an active award (due support in the past year). Since there is evidence that a substantial share of these women are in fact child support eligible and because they account for a non-trivial portion of the child support supplement sample, I decided against excluding these cases.

[7] Women eligible for child support are the most obvious sample to use in studying the effects of CSE on child support outcomes. However, there is a potential problem of selection bias with this sample definition that should be acknowledged. In other work, Nixon (1995b), I have found evidence that CSE affects entry into single motherhood through marital breakup. There will be (positive) sample selection bias only if this deterrent effect is systematically related to unobserved determinants of child support outcomes (i.e. where CSE is high those who become single mothers have relatively high unobserved award propensities). Several facts suggest that this is unlikely. First, the present study finds positive effects of CSE on award rates for never-married and separated mothers only. This implies that if selection into single motherhood is driving the results, CSE must have this selection effect on entry through separation and out-of-wedlock childbearing but not divorce. This seems doubtful particularly since I have found that CSE has does not effect out-of-wedlock childbearing in the first place (Nixon, 1995b). In addition, the positive selection bias hypothesis implies that where CSE is high the fraction of custodial mothers with voluntarily agreed to awards should be higher (for CSE to deter entry, effects on fathers must dominate, and thus where CSE is high only the fathers most "willing" to provide support become absent fathers). However, the CPS data shows the opposite pattern; the percent of mothers with voluntary awards is actually lower in the higher CSE states.

divorced husband in the household. In the CPS, "separated" is defined as legally separated, living apart with intention to divorce, and permanently or temporarily estranged from spouse; all of these situations are consistent with child support eligibility.

4.2 Child Support Outcomes

Definitions of the child support outcomes used in the analysis are presented in Table 1. To study award rates, I follow Garfinkel and Robins (1994) and Miller et. al. (1994) and define the award variable (A) as equal to 1 if the mother has an active award, meaning that an award exists and she was due support during the previous calendar year.[8] In the survey, women with active awards are asked how much child support they were supposed to receive in the previous calendar year. This measure of the award level (D) may differ from the original amount awarded if the award has been updated or modified. Finally, child support income (C) is reported as the total dollar amount received in the previous calendar year. We can compute the compliance rate (T) as the ratio of the amount received (C) to the amount due (D).

Table 2 presents sample means for child support income and the three intermediate child support outcomes outlined in equation (1) for the full sample and each marital group. There are striking marital status differences in the final outcome, the amount of child support received. Specifically, average annual child support receipts (in real 1990 dollars) among never-married mothers are only $181 compared to $927 for separated, $1218 for remarried, and $1727 for divorced.

Using the framework outlined in equation (1) to decompose child support receipts, we can examine how differences in the three intermediate outcomes contribute to the observed marital status differential in final outcomes. As shown in the second row of Table 2, award rates display the same marital status ordering as the final outcome, with

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[8] An alternative definition used by Beller and Graham (1993) is to set the award variable equal to 1 if child support was ever agreed to or awarded. One possible reason that the two definitions differ is that some women in the sample were not actually eligible to receive support in the previous year, perhaps because the father had died, the children were too old, or the award was established since the prior year ended. Unfortunately, due to the survey design such women may be included in the sample and cannot be identified. My results are not sensitive to the choice of the award variable definition.

never-married mothers at the bottom (14.2%), then separated (36.6%), then remarried (62.8%), and finally divorced at the top (70.2%). The extremely low award rates for never-married mothers may stem from the fact that these women face additional barriers in establishing awards such as paternity establishment and lack of legal relationship to the father. Award levels and compliance rates among those mothers with awards do not exhibit the same marital status ordering observed in both average receipts and award rates. In particular, separated mothers have the highest compliance rates and the highest average award levels of all four groups. Also, while never-married women do have the lowest average award level, the compliance rate of this group is above that for remarried women. On average, absent fathers may be less willing to provide support if the mother remarries. Award levels and compliance rates also exhibit less marital status variation than award rates, particularly in the case of compliance. All four marital groups receive between 57% and 66% of what they are owed. A likely explanation for this finding is that separated and never-married women who actually get awards are a relatively select group characterized by high willingness to pay on the part of the fathers. This decomposition of child support payments has shown that differences in award rates play a primary role in the marital status differences in final outcomes. In the remainder of the paper, I focus exclusively on this outcome.

The bottom portion of Table 2 presents average award rates for each marital status group for each CPS survey separately. The data shows some differences in award rate trends between the groups. In particular, there is more improvement in child support award rates over the period for the groups with lower award rate levels, particularly the never-married.[9] Still, the most striking pattern which emerges in the data is the strong ranking of award rates by marital status. In each survey year, we see the same marital status ordering in award rates as observed in the pooled 1978-1989 sample, in particular: divorced > remarried > separated > never-married.

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[9] One obvious question which arises is to what extent these marital differences and trends in child support outcomes over time can be explained by differences in the socioeconomic and demographic characteristics of these groups and changes in these characteristics over time. These questions are addressed in detail by Beller and Graham (1986b, 1993) for the 1978-1985 period.

4.3 Socioeconomic and Demographic Characteristics

As described in equation (4), the probability of having a child support award is empirically modelled as a function of mother and custodial family characteristics (X_m, X_c), state socioeconomic and demographic variables (S_1), and Child Support Enforcement (E) variables. Table 1 presents a full list and definitions of the specific variables employed in this analysis. The vector of mother characteristics (X_m) consists of basic demographic variables: marital status, age, race, and years of education completed. The custodial family characteristics (X_c) include the number of children eligible for child support, an indicator variable for the presence of at least one school age child (over 5 years), and variables for metropolitan (SMSA) residence, central city residence, and region of residence (using the nine Census regions).[10]

Since there is no data on father characteristics, several state level variables are added to the award equation as additional proxies for his ability and willingness to pay. The state unemployment rate and state per capita income are expected to affect the father's ability to pay through effects on his earnings (assuming he lives in the same state). The maximum welfare benefit is included as a measure of the alternative income available to single mothers which may affect his willingness to pay. Clearly, these three variables may also affect the mother's expected benefits to seeking support. These state variables are matched to each custodial mother based on her state of residence and the year prior to the survey, which is the year relevant to the child support outcome variable.

Table 3 presents variable means for the set of CPS and state level variables described above for the full sample of custodial mothers and each marital status group. In the pooled 1978-1989 CPS sample of child support eligible mothers, 23% are never-married, 35% are divorced, 27% are remarried, and 15% are separated.[11] Comparing

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[10] Beller and Graham (1993) provide a detailed discussion of how the mother and family characteristics available in the CPS relate to the primary determinants of child support outcomes (i.e. father's ability to pay, father's willingness to pay, mother's costs and benefits to securing support) and their expected net effect on outcomes.

[11] It is worth noting here that the marital status composition of custodial mothers did shift over the sample period. In particular, the percent never-married increased steadily from 20% in the 1979 survey to 28% in the 1990 survey.

sample means of the mother and family characteristics across marital status, we see that the two groups with particularly low award rates, never-married and separated, do display demographic characteristics which we expect to be negatively associated with child support outcomes. In particular, they have lower average education, are more likely to be black, and are more likely to live in central cities, relative to both divorced and remarried custodial mothers.

4.4 Child Support Enforcement Data

A primary goal of this paper is to study how the government CSE program affects the child support award rates of custodial mothers. As noted in the introduction, the CSE program is administered through state agencies which provide direct services to families seeking child support. Each year the federal Office of Child Support Enforcement collects statistical data on these state agencies which is reported in the Child Support Enforcement Annual Report to Congress (U.S. DHHS). These reports provide state by state information on CSE agency collections, caseloads, expenditures, and staff, as well as the number of awards and paternities established, and parents located. To examine the effect of the CSE program on award rates, I construct six variables using data from the CSE Annual Reports to Congress covering the 1978-1989 period.[12] These six variables, which are described in detail below, focus on CSE expenditures, staff, program organization, parent location, and paternity establishment. Since my dependent variable is a child support outcome, I do not include CSE agency outcome measures (e.g. dollars collected per family, percent of cases with collections, or the rate of award establishment) as explanatory variables in order to avoid the potential problem of reverse

[12] Another aspect of government policy that may affect award rates is state laws related to paternity establishment (such as genetic testing upon request, allowing paternity establishment up to age 18, and statutes which allow for pursuing paternity across state lines) and child support award guidelines. I do not currently have data on these laws. Therefore, such laws remain in the error term in the analysis presented below. If these laws do affect award probabilities and are also correlated with CSE program characteristics, the estimated effects of CSE will be biased by their omission. However, previous research reveals limited evidence of impacts of paternity and guideline laws on award rates (Beller and Graham, 1993; Miller et. al., 1994; Argys et. al., 1995), which suggests this is unlikely to be a serious problem.

causality.[13]

As noted above, the CSE program characteristics are expected to have a direct effect on child support outcomes of individual mothers who participate in the CSE system, either voluntarily or through the requirements of the AFDC program. I also propose that the CSE variables have an indirect, or spillover, effect on mothers outside the CSE system by shaping the general enforcement climate in the state.

Definitions of the six CSE variables are listed in Table 1. Sample means of these variables for the mothers in the CPS are presented in Table 3 and correlation coefficients are in Table 4. The first two variables measure the resources devoted to the state CSE program. In particular, EXPEND is defined as per capita CSE program expenditures in the state (in real 1990 dollars), and STAFF is defined as the total number of full-time equivalent staff employed in CSE as of September 30 of the given year, per 10,000 population.[14] The means of these variables are $4.28 per capita and 1.1 workers per 10,000 population, respectively. I expect that higher values of these variables are associated with lower costs of seeking support for the custodial mother and potentially higher willingness to pay on the part of the absent father by raising his cost of nonpayment, both of which should increase the award probability.

The next two variables reflect the institutional organization of the state's CSE program. The total staff associated with each state's CSE program (and included in the staff variable) consists of staff directly employed by the CSE program agencies and,

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[13] Estimates of the child support award equation using collections oriented CSE variables, such as collections per dollar spent, do show the same pattern in results as the six variables employed below. CSE agency outcome measures are used in Nixon (1995b) in which I examine the effect of CSE on the rate of marital dissolution. Because the dependent variable in that analysis is not a child support outcome, direct relation between the dependent variable and the CSE program outcome measures is less of a concern.

[14] For both of these variables, I considered using the number of single parent families in the state as the denominator. Several previous authors looking at CSE policy effects (Garfinkel and Robins (1994) and Miller et. al (1994)) have used CSE expenditure variables which are normalized by the number of female headed families in the state. However, as I show in Nixon (1995b) entry into single motherhood through divorce or separation is reduced by CSE efforts. Therefore, normalizing CSE expenditures (or staff) by such a variable may exaggerate the cross-state variation and bias CSE coefficients upward. To avoid this potential problem, I use state population in the denominator.

secondly, staff employed by other public or private agencies, working under cooperative agreement or purchase-of-service agreement with the CSE agency, i.e. contracted out. The PCTOUT variable is defined as the percent of the total CSE staff that is contracted out. The average value of this variable in the sample is 34.5%. The second CSE organization measure is an indicator variable set equal to 1 if there is local provision of CSE services (either completely local or both state and local) and equal to 0 if provision is at the state level only. Approximately 34% of the sample lives in a state with local provision of CSE services. I expect that relative to state level provision, local provision of services should lower the mother's cost of seeking support.

The last two variables measure the CSE agency's effectiveness at establishing paternity (PATRATE) and locating absent parents (PARLOC). These variables are each normalized by the state population (as with the expenditure and staff variables), and the variable means are .9 paternities established per 1,000 population and .4 parents located per 100 population, respectively. Higher rates of paternity establishment and parent location are each expected to lower the costs and raise the expected benefits of seeking support and therefore raise award probabilities. In a fully specified model, the paternity rate variable should not show any effect on ever-married women since paternity establishment is not relevant to their child support outcomes.

These six CSE program variables tend to be positively correlated (Table 4). The most highly correlated variables are CSE expenditures and staff with a correlation coefficient of .7488. It is not surprising that states which spend more on CSE also employ larger staffs. The next highest correlations are observed for the CSE paternity rate which has a correlation of approximately .44 with CSE expenditures, staff, and parent location respectively. Parent location is also positively correlated with expenditures and staff at a slightly lower level. Given that it takes resources to establish paternity and locate parents and that parent location may be required before paternity can be established, these correlations are in the expected directions. Of the fifteen pairs of CSE variable correlations, three are negative but these correlations are all relatively small.

The six CSE variables are matched to the custodial mothers in the CPS by state

of residence and pre-survey year. Due to CSE data limitations, this detailed of a match is not possible for STAFF, PCTOUT, and LOCAL. For these cases, I have primarily used the closest year available.[15] Another limitation is that data on the father's state of residence is not available. If the father's state differs from that of the mother, the CSE environment in her state (which is used in the analysis) is still relevant to her child support outcomes, but CSE in his state also plays a role.

In the analysis that follows, the effect of CSE on the probability of having a child support award is identified by exploiting the large degree of cross-state variation in CSE program characteristics. A general concern in estimating the effects of state policy efforts, such as CSE, is whether there exist unmeasured state characteristics which are correlated with the policy variable and the outcome of interest. For example, it is likely that states with good economic conditions tend to spend more on CSE and to have higher child support award rates. If this is true, then without controlling for state economic conditions in the award equation (4), the error term (ϵ) would be correlated with CSE, and the estimated effect of CSE expenditures on awards would be biased (upward). I address this concern in my empirical analysis by including a rich set of state economic and demographic variables in the award equation.[16] In particular, I control for state unemployment, income, and welfare generosity, which were discussed above (S_1), plus the state's age distribution, religious composition, and the density of lawyers, denoted by S_2. As with S_1 and E, the variables in S_2 are matched to each custodial mother based

[15] In particular, I have not been able to acquire PCTOUT and STAFF data for the years 1978, 1981, or 1983. This data was not reported by OCSE before 1982, and I have been unable to acquire the 1983 OCSE data. Given this limitation, I have matched the 1982 CSE values to women in the 1979 and 1982 CPS surveys (instead of 1978 and 1981 respectively) and the 1984 CSE value to the women in the 1984 CPS survey (instead of 1983). Second, I have only been able to acquire data on LOCAL provision for 1980-1982 and 1984. Given this, I match the closest available preceding year, with the exception of women surveyed in 1979 who receive the 1980 value.

[16] Another potential way to address this issue is to add a vector of state fixed effects to the equation. However, I find there is insufficient within-state variation in the CSE program characteristics over time to take this approach. A recent Congressional Budget Office (1995) report also documents the lack of over-time variation in CSE agency variables.

on her state of residence and, when possible, the year prior to the survey.[17] Definitions of the specific variables in S_2 are listed in Table 1 and means of these variables are reported in Table 3.

The indicator variables for the mother's region of residence (at the level of the nine Census regions) included in X_c will also control for characteristics common to states in the same geographic region. Taken together these state and regional variables should capture a host of attitudes and characteristics which may potentially be correlated with state CSE and award rates.[18] Adding the full set of state variables to the award equation, we have:

$$(5) \qquad A = f(X_m, X_c, S_1, S_2, E, \epsilon').$$

This is the equation I estimate in the empirical analysis which follows.

5. Analysis and Results

5.1 Award Probabilities: The Effect of Marital Status

In this section, I examine the effect of marital status on award rates and test whether the effects of the explanatory variables in the award probability equation (5) significantly differ by marital status.[19] Table 5A presents Probit coefficient estimates

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[17] The religious composition variable (percent Catholic) is measured in 1980 and matched by state of residence only. The lawyer density variable is available for 1980, 1985, and 1988; the 1980 value is assigned to women in the 1979 and 1982 surveys, the 1985 value to women in the 1984 and 1986 surveys, and the 1988 value to the women in the 1988 and 1990 surveys.

[18] I also considered controlling for the family structure composition in the state using variables such as the percent of unmarried births, the divorce rate, and the marriage rate. However, since CSE tends to lower divorce rates as I show in Nixon (1995b), it is not clear whether we want to hold such family structure variables constant in estimating the effects of CSE. Estimates of the award equation which add these variables are presented in the Appendix Table A.1. With these three variables included, the basic pattern in the significance of the effects is unchanged and the magnitude of the CSE effect is somewhat smaller.

[19] By including marital status as an explanatory variable (and stratifying the sample by this characteristic), I implicitly assume current marital status of child support eligible mothers is exogenously determined. While this assumption is quite standard in the child support literature, we might be concerned that marital transitions of custodial mothers (i.e. the decision either to marry a new spouse or partner or

of the award equation for the full sample and for each marital subgroup separately. Estimated effects of each variable on the average award probability (i.e. mean derivatives) are presented in Table 5B.

The estimation of the award equation using the full sample of mothers allows the constant term to vary by marital status but constrains all other coefficients to be equal across marital status. These results are presented in the first columns of Tables 5A and 5B. After controlling for the mother, family, state, and CSE program characteristics included in the award equation, we still see large marital status differences in award rates. Relative to divorced mothers (the omitted marital status in the equation) with the same characteristics, average award probabilities are 47.22 percentage points lower for never-married mothers, 24.72 percentage points lower for separated mothers, and 9.25 percentage points lower for remarried mothers.[20] These compare to raw differentials in award rates of 55.93 between divorced and never-married, 33.46 between divorced and separated, and 7.30 between divorced and remarried (see Table 2).

To determine whether there are significant marital status differences in the effects of the explanatory variables on award probabilities, I performed two tests. First, I compared an unconstrained model of four separate award equations for each marital status type, which allows all coefficients to vary across marital status, against a constrained model which pooled all mothers allowing only the constant term to vary across marital status groups (the full sample equation discussed above). Using a

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to remain separated, divorced, or never-married) are shaped by child support outcomes. In this case, current marital status would be endogenous. However, two recent works (Beller and Graham (1993) and Hu (1993)), which consider the effect of child support outcomes on remarriage decisions, both conclude that child support does not have any systematic or significant effect on remarriage decisions of custodial mothers.

[20] In Probit estimates of award equations using the 1979-1986 CPS surveys and a very similar set of CPS variables but no state or CSE variables, Beller and Graham (1993) report somewhat larger reductions for never-married and separated (62.7 and 33.2 percentage points respectively) and somewhat smaller reductions for remarried mothers (4.3 percentage points), all relative to divorced.

likelihood ratio test, the constrained model was strongly rejected.[21] Differences in the effects of demographic variables on award probabilities between never-married and ever-married mothers were found by Beller and Graham (1986b) using a linear probability (OLS) model and the 1979 and 1982 CPS data. To address the possibility that my result is driven by differences between never-married and ever-married mothers while significant differences do not exist between the ever-married subgroups (separated, remarried, divorced), I tested the restriction of pooling the three ever-married subgroups against an unconstrained model of three separate equations. The restricted model was strongly rejected.[22] Together these tests clearly demonstrate that there are significant differences between the four marital groups. This finding implies that we should be cautious in interpreting the estimates based on pooled samples of custodial mothers.

The effects of mother and family characteristics on award probabilities has been discussed by Beller and Graham (1993) for the 1979-1986 CPS surveys. My estimates generally confirm their findings. In particular, both analyses show that age, being non-white, and living in a central city are negatively related to award probabilities of custodial mothers, while years of education, the number of children, and having an older child have positive effects. Consistent with the Beller and Graham (1993) study, I also find that fewer demographic characteristics are statistically significant determinants of award probabilities among never-married mothers than among ever-married mothers. However, my work also provides evidence of differences between the three types of ever-married mothers, which they do not consider (they pool these groups). For example, I find that each additional child raises the award probability by approximately 2.8 percentage points for remarried and divorced women but is not significantly related to the award probabilities of separated (or never-married) mothers. My estimates also show

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[21] The test statistic, which is distributed chi-squared with 102 degrees of freedom, is equal to 497.878. The critical value for the chi-squared distribution with 100 degrees of freedom at a .005 (.5%) significance level is 140.2.

[22] The test statistic, which is distributed chi-squared with 68 degrees of freedom, is equal to 231.263. The critical value of the chi-square distribution with 70 degrees of freedom at a .005 (.5%) significance level is 104.2.

that central city residence is negatively associated with award probabilities for separated and divorced mothers but is an insignificant determinant in the remarried sample. There is also evidence of marital status variation in the effects of the state characteristics which I include in the award probability model. For example, the number of lawyers per capita has a statistically significant (negative) effect on award probabilities for never-married mothers only, and the unemployment rate has a significant (negative) effect for separated mothers only. The effects of the CSE variables and marital status differences in these effects are discussed below.

5.2 Award Probabilities: The Effect of CSE by Marital Status

Tables 6A and 6B present Probit coefficients and mean derivative estimates, respectively, for the effects of the CSE variables on award probabilities. The estimates in the top half of these tables correspond to six different equations estimated for each sample, each including a single CSE variable. The bottom half corresponds to the full specification which includes all six CSE variables jointly (the same equation presented in Tables 5A and 5B). Individual inclusion of the CSE variables is used as an initial strategy to ascertain general patterns in the sign and significance of CSE effects without the problem of multicollinearity among the CSE variables. All equations include the complete set of mother, family, and state characteristic variables.

In the full sample of custodial mothers, there is evidence that CSE has a statistically significant effect on award probabilities. When the CSE variables are individually entered, EXPEND, STAFF, PCTOUT, and PATRATE each have positive coefficients which are significantly different from zero at 5% or better.[23] In the specification which includes all six CSE variables, the CSE variables are jointly

[23] Garfinkel and Robins (1994), Miller et. al. (1994), and Beller and Graham (1993) have also estimated the effect of CSE expenditures on child support outcomes. The first two papers cited normalize CSE expenditures by the number of female headed families, while Beller and Graham (1993) normalize by population as is done here. Both Garfinkel and Robins (1994) study and the Miller et. al (1994) find positive effects of CSE expenditures on child support awards which are significant at 10%. Beller and Graham (1993) find a negative but not statistically significant effect. I am not aware of any studies of child support outcomes which use the other CSE program variables analyzed here.

significant at a significance level of 0.3%. In this specification, EXPEND and PCTOUT remain individually significant, though the magnitude of the effect of EXPEND is reduced relative to when this variable is entered individually. The effects of the STAFF and PATRATE variables are no longer significantly different from zero. Since we have seen that STAFF and EXPEND are highly correlated, multicollinearity may explain the result.

The estimates for the full sample suggest that CSE has a positive impact on the child support award rates of custodial mothers. However, as we saw above for the effects of demographic and state characteristics, the estimated CSE effects in the full sample mask considerable heterogeneity between marital status groups. Columns 2-5 of Tables 6A and 6B present the CSE variable effects on award probabilities for each of the marital subgroups of custodial mothers. A clear pattern in CSE effects is evident. In particular, I find strong evidence of significant, positive effects of CSE program variables on the award rates of never-married and separated mothers, while there appears to be little to no effect on remarried and divorced mothers. In the models which individually enter the CSE variables, EXPEND, STAFF, PCTOUT, and PATRATE each have positive effects on never-married mothers' award probabilities at a significance level of 1%, and PARLOC is significant at 5%. The LOCAL variable is the only CSE variable which is not statistically significant for this group. Among separated mothers, STAFF and PCTOUT are significant determinants of award probabilities at 1%, while PATRATE and PARLOC are significant at 10% (when entered individually). Not surprisingly, the full specification which includes all six CSE variables shows clear evidence of a CSE effect on awards for both the never-married and the separated samples. Likelihood ratio tests of the joint significance of the six CSE variables, strongly reject the hypothesis of zero effect.[24]

In striking contrast, the estimates show basically no effect of CSE on the award probabilities of either remarried or divorced mothers. When entered individually, none

[24] For the never-married sample the p-value for the test statistic is 0.0000, and for the separated sample it is 0.0073.

of the CSE variables have a statistically significant positive effect for remarried or divorced mothers. In fact, higher rates of CSE parent location (PARLOC) show a marginally significant negative effect on the award rates of remarried mothers. When the six CSE variables are jointly entered in the award equations for remarried and divorced women, I find further evidence that CSE has no effect on these groups. In both samples, we cannot reject the hypothesis of zero effect of the CSE variables on award probabilities at any reasonable level of significance.[25]

In the never-married and separated samples where there is evidence of a CSE effect on award probabilities, we can consider the relative magnitude of this effect between the groups. The estimates of the change in the average award probability for a one unit change in the CSE variable, when individually entered, show no clear size pattern between these two groups. For an increase in STAFF or PARLOC the percentage point change is larger for separated mothers, while for an increase in EXPEND or PATRATE the change is larger for never-married. The change associated with an increase in PCTOUT is quite similar for both groups. However, if we measure the change in the award rate relative to the average award rate of each group, the impact of CSE is larger for never-married mothers for each of these CSE variables. This is due to the fact that never-married mothers have such a low award rate (.142). Taking the staff variable as an example, a one unit increase in STAFF (additional worker per 10,000 population) raises award probabilities of never-married by 3.9 percentage points compared to 6.2 for separated. The change is larger for separated mothers. However, as a percent of the award rate, the order reverses: 27.5% for never-married vs. 16.9% for separated.

5.3 Award Probabilities: Interpreting the Marital Status Differences

The preceding section provides evidence that CSE has a positive impact on the child support award probabilities of never-married and separated mothers but no effect

[25] For the remarried sample the p-value of the test statistic is 0.7131, and for the divorced sample it is 0.2531.

on divorced or remarried mothers' award rates. In the model outlined above, CSE is expected to have direct effects on custodial mothers who receive CSE agency services and only indirect, or spillover, effects on mothers outside the CSE system. Therefore, one factor which may be contributing to the marital status differences in estimated effects of CSE is different levels of "take-up" of CSE program assistance across these groups. In other words, if the proportion of never-married and separated mothers who receive direct assistance from the CSE program is higher than the proportion of divorced and remarried mothers, then we would expect to observe larger effects of CSE on the first two types of mothers.

To gain some insight into whether never-married and separated mothers do have more direct contact with CSE, I combine several pieces of information available in the CPS surveys.[26] Since all AFDC recipients are required by law to participate in the CSE program, marital status groups with a high proportion of members receiving AFDC will automatically have high contact with the CSE program. As shown the first row of Table 7, never-married women and separated women do have the two highest rates of AFDC participation among the four groups, at 44.5% and 30.2% respectively.[27] For custodial mothers who are not in the welfare system, participation in CSE is voluntary. Information regarding contact with the CSE program is available for mothers who did not receive AFDC during the past year in all CPS Child Support Supplement surveys except for 1979. As shown in Table 7, this data suggests there are relatively small marital status differences in self-initiated contact with CSE in the non-AFDC population. Never-married and separated non-AFDC mothers report having contacted CSE at a rate of approximately 19%, while the rate for remarried and divorced non-AFDC mothers is slightly higher at 23%. I then compute an adjusted CSE contact variable, equal to 1 if the mother received AFDC in the past year or she was both not on AFDC and reported

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[26] Unfortunately, the CSE Annual Reports to Congress do not provide any information on program participation by marital status.

[27] While currently married women are ineligible for AFDC we see a small share of remarried mothers reporting AFDC receipt. This discrepancy is likely due to the fact that marital status is measured in the current year and the AFDC variable refers to the previous calendar year.

having contacted CSE. Since the marital status differences in AFDC participation are large relative to the opposing differences in non-AFDC CSE contact, this adjusted contact variable shows the highest rates for the never-married (55%) and separated (44%) marital status groups.

If contact with CSE via the AFDC program is part of the reason we see larger effects of CSE on the award probabilities of never-married and separated mothers, then we should also see relatively larger (smaller) effects of CSE on the award rates of custodial mothers in other demographic groups which have high (low) rates of AFDC participation. To explore this empirically, I estimate the effect of CSE on award probabilities in three pairs of demographic groups with relatively high and low AFDC participation rates, respectively: younger vs. older mothers (cut at 30 years), less educated vs. more educated mothers (cut above and below 12 years), and non-white vs. white mothers.[28]

The Probit estimates of the effects of CSE in these six samples are presented in Table 8A and the estimated mean derivatives in Table 8B. These three sets of results are consistent with hypothesis outlined above. In particular, there is evidence of relatively larger effects of CSE on the award probabilities of mothers in the demographic groups with relatively higher AFDC participation rates. For example, the low education group (less than 12 years completed) has an AFDC participation rate of 40% compared to 11% in the high education group. In the low education (high AFDC) sample, EXPEND, STAFF, PCTOUT, and PATRATE are each statistically significant when individually entered, and when jointly entered the six CSE variables are highly significant (at 1.2%). In contrast, the CSE variables are not significantly related to award probabilities for mothers in the high education sample, either when entered individually or jointly. The exact same pattern in CSE effects is evident in the estimates for the "young" and "old" samples, in which the AFDC participation rates are 36% and 15% respectively. CSE appears to affect award probabilities for the younger mothers but not the older ones. In

[28] I do not stratify the sample by actual AFDC participation status since this is endogenous to child support outcomes.

the breakdown by race, we do observe some statistically significant CSE effects in the low AFDC (white) sample. However, the CSE effects in this sample tend to be considerably smaller in magnitude than the CSE effects for the high AFDC racial groups (non-whites). For example, the effect of a unit increase in EXPEND, when individually entered, is 1.12 for non-whites compared to 0.69 for whites.[29] The large sample size for whites (17349) allows for the possibility of precise estimation of small effects. Overall, these three pairs of award equation estimates are consistent with the idea that the AFDC-CSE connection may be part of the reason we see larger CSE effects on never-married and separated mothers.

Another factor that may be contributing to the observed marital status pattern in CSE effects is that the outcome under consideration is the child support award. It is possible that CSE is less necessary to ever-divorced (currently divorced or remarried) mothers relative to never-divorced mothers (separated or remarried) at the stage of award establishment. The distinction of having divorced is non-trivial in terms of securing a child support award. In particular, ever-divorced mothers all have the benefit of legal proceedings associated with divorce, which facilitate the establishment of agreements regarding child support. Neither never-married nor separated women have any such legal institution in place. For this reason, the CSE program may be more important to never-divorced mothers for award establishment relative to ever-divorced mothers.

6. Discussion and Conclusions

This paper extends the child support literature by examining how government Child Support Enforcement (CSE) affects the outcomes of custodial mothers in different demographic groups, focusing particularly on differences by marital status. The results provide striking evidence of between group heterogeneity in CSE program effects within the total child support eligible population. When it comes to Child Support Enforcement, it is quite clear that "one size fits all" does not apply.

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[29] Beller and Graham (1993) find a similar pattern in the effect of CSE collections per $1 spent on award probabilities on Blacks and Non-blacks. Their estimates suggest that a one unit change in collections per $1 spent raises award rates by 1.6 percentage points for Blacks and .7 for non-Blacks.

Heterogeneity in the effects of CSE has several important implications. First, once we allow for between group differences, it becomes evident that treating all custodial mothers alike may generate misleading conclusions about the effects of CSE. In the present analysis, I found strong effects of CSE for never-married and separated mothers' award rates but no effects for divorced and remarried mothers. In the pooled sample of mothers, these differences are obscured in one overall effect. This may explain why several previous authors found only weak effects of CSE expenditures on award rates (Beller and Graham, 1993; Garfinkel and Robins, 1994; Miller et. al., 1994).

Second, these results imply that CSE has significant effects on the award rates of demographic groups which are likely to have higher direct contact with CSE due to high rates of AFDC participation. However, in other work (Nixon, 1995a) I found that CSE expenditures are relatively ineffective at raising the child support collections of the AFDC caseload in the CSE system. There are several possible explanations for these seemingly contradictory results. It may be that the award rates of these demographic groups are low enough that CSE spending on the margin is devoted to paternity establishment, parent location, or award establishment efforts, which do not immediately raise collections. Another possible reason is that even when awards are established, the fathers associated with these families are unable to pay support because of their own lack of income. On the other hand, it could be that these fathers are able to pay, but the 100% tax on child support by AFDC creates a strong disincentive for payment. Before making policy recommendations, further research is necessary to determine which of these potential reasons accounts for the empirical finding that CSE raises awards but not collections for these mothers. If the problem is that these fathers have nothing to pay, then policy attention should go either towards raising their incomes or towards raising collections where there is money to be had (e.g. the non-AFDC caseload). If, instead, the 100% AFDC tax is deterring payments that could otherwise be made, lowering this rate might be worth considering.

On the flip side, the results obtained here imply that CSE has little to no effect on award rates of ever-divorced custodial mothers and a set of other demographic groups with low AFDC participation rates. Initially, this finding seems to suggest that CSE is

ineffective for these groups. This is problematic if a CSE policy goal is to assist all families eligible for child support. However, in Nixon (1995a) I find that among those who do use CSE program services, CSE is highly effective at raising collections for non-AFDC families, both in absolute terms and relative to AFDC families. Therefore, it may be that CSE does affect award rates of mothers in these demographic groups who actually use CSE services, but we can't see effects in the aggregate population because a small share of these women actually participate in CSE. Alternatively, it could be that CSE has no effect on the award rates of these women, but does impact their outcomes at later stages, such as the collection of child support that has been awarded, as implied by Nixon (1995a).

If a policy objective of CSE is to maximize current child support collections at the lowest cost given the existing CSE system, this set of results call for policy efforts directed towards bringing non-AFDC custodial mothers into the CSE program. These are the people for whom CSE is highly cost-effective in raising collections. Some movement in this direction has been occurring. Between 1980 and 1991, the number of non-AFDC participants increased by 535% and the proportion of non-AFDC cases increased from 16% to 40% (U.S. DHHS, 1984, 1991). Eliminating the non-AFDC application fee for CSE services that currently exists and increased effort to publicize the availability of CSE services to the general public could both further this trend.

Given that a clear goal of the recent welfare reform proposals is to remove current welfare recipients from the rolls, identification of the reason for the ineffectiveness of CSE in terms of raising collections for the AFDC population is also recommended. Since having an award is a necessary pre-condition for collection of support, raising the award rate is the only way to raise future collections for these mothers. Unless the reason for lack of a CSE effect on AFDC collections is fathers' inability to pay, devoting continued CSE efforts to raising the award rates of single mothers on AFDC is warranted.

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TABLE 1 - Variable Definitions

Child Support Outcomes	
Receipt Amount	Child support received in previous year (in real 1990 dollars)
Award Rate	Percent with award established and due support in previous year
Award Amount	Child support due in previous year (in real 1990 dollars)
Receipt Rate	Percent receiving support in previous year
Compliance	Percent of award received: (Receipt Amount / Award Amount)
Mother Characteristics	
Never Married	1 if current marital status is never-married
Separated	1 if current marital status is separated
Remarried	1 if current marital status is remarried
Divorced	1 if current marital status is divorced
Age	Age in years
Black	1 if mother's race is Black
Other Non-white	1 if mother's race is not White and not Black
White	1 if mother's race is White
Education	Years of education completed
Year	Six indicator variables for the survey year
Custodial Family Characteristics	
Kids Eligible	Number of own children living in the household from the divorced or separated husband if ever-married and in total if never-married
Kid > 5	1 if there is at least one child over the age of 5 in the family
SMSA	1 if the family resides in a Standard Metropolitan Statistical Area
Central City	1 if the family resides in a central city
Region	Nine indicator variables for the Census regions: New England, Middle Atlantic, East North Central, West North Central, South Atlantic, East South Central, West South Central, Mountain, and Pacific
Child Support Enforcement	
EXPEND	State CSE program expenditures per capita in real 1990 dollars
STAFF	Total number of full-time equivalent staff employed by the CSE program per 10,000 population
PCTOUT	Percent of the total CSE staff employed under cooperative purchase of service agreements (contracted out to other private and public agencies)
LOCAL	1 if there is local provision of the state's CSE program
PATRATE	Number of paternities established by CSE per 1,000 population
PARLOC	Number of absent parents located by CSE per 100 population
State Characteristics	
Unemployment	State unemployment rate
Per Capita Income	State per capita income (in 1000s of real 1990 dollars)
AFDC Max Benefit	State maximum AFDC benefit for a family of four (in 1000s of real 1990 dollars)
Pop <18	Percent of state population ages 0-17
Pop 18-44	Percent of state population ages 18-44
Pop 45-64	Percent of state population ages 45-64
Lawyers	Number of lawyers per capita
Catholic	Fraction of state population which is Catholic (1980)

TABLE 2 - Means of Child Support Outcomes by Marital Status

	Full Sample	Never Married	Separated	Remarried	Divorced
Sample Size:					
All	23859	5456	3660	6433	8310
Cases with awards	11979	773	1341	4040	5825
All Years:					
Receipt Amount (all)	1113.51	181.03	927.29	1218.15	1726.75
Award Rate (all)	50.21	14.17	36.64	62.80	70.10
Award Amount (with awards)	3358.25	2018.95	3666.43	3191.32	3580.80
Compliance (with awards)	61.11	60.72	65.67	57.42	62.67
Award Rate By Year:					
1978	49.16	7.25	36.87	59.09	70.33
1981	49.48	10.27	32.91	59.95	71.08
1983	47.65	12.22	31.01	58.99	66.06
1985	50.48	14.19	34.82	61.83	71.56
1987	52.67	16.31	44.97	69.54	71.46
1989	51.56	20.17	40.56	66.87	70.58

Notes:
Receipt amounts and award amounts are measured in real 1990 dollars.
The award amounts and compliance are reported for those cases with awards.

TABLE 3 - Means of Explanatory Variables by Marital Status

	Full Sample	Never Married	Separated	Remarried	Divorced
Sample Size	23859	5456	3660	6433	8310
Mother Characteristics:					
Age	33.746	27.189	34.496	35.203	36.592
Black	.242	.560	.320	.055	.144
Other Non-White	.031	.037	.031	.026	.029
White	.727	.403	.648	.918	.827
Education	11.984	11.389	11.449	12.270	12.388
Family Characteristics:					
Kids Eligible	1.678	1.644	1.891	1.557	1.700
Kid > 5 years	.691	.459	.661	.836	.745
SMSA	.674	.743	.733	.589	.669
Central City	.305	.478	.379	.162	.270
Child Support Enforcement:					
EXPEND	4.276	4.645	4.438	4.004	4.173
STAFF	1.137	1.214	1.187	1.075	1.112
PCTOUT	.345	.342	.342	.341	.353
LOCAL	.341	.356	.390	.307	.335
PATRATE	.925	1.053	.956	.851	.885
PARLOC	.429	.439	.408	.437	.425
State Characteristics:					
Unemployment	6.998	6.953	7.046	6.948	7.044
Per Capita Income (1000s)	16.827	17.221	17.060	16.511	16.712
AFDC Max Benefit (1000s)	6.502	6.455	6.673	6.365	6.565
Pop < 18	.273	.269	.271	.276	.274
Pop 18-44	.422	.423	.421	.422	.422
Pop 45-64	.188	.190	.191	.186	.188
Lawyers Per Capita	3.191	4.223	3.455	2.545	2.898
Catholic	.204	.211	.218	.189	.205

Notes: The other variables included in the equations but not listed in this table are indicator variables for survey year [5] and region of residence [8].

TABLE 4 - Correlations of CSE Variables

	EXPEND	STAFF	PCTOUT	LOCAL	PATRATE	PARLOC
EXPEND	1.0000	...	...	...	...	...
STAFF	.7488	1.0000	...	...	...	...
PCTOUT	-.0151	.1447	1.0000	...	...	...
LOCAL	.3254	.2440	-.1687	1.0000	...	...
PATRATE	.4489	.4400	.2331	.1344	1.0000	...
PARLOC	.3273	.2699	.0164	-.0416	.4372	1.0000

Table 5A - Award Equation Estimates: Probit Coefficients and Standard Errors*

	Full Sample	Never Married	Separated	Remarried	Divorced
Never Married	-1.4755	...	...	...	...
	(.0306)				
Separated	-.7825	...	...	...	...
	(.0271)				
Remarried	-.3013	...	...	...	...
	(.0225)				
Age	-.0165	-.0098	-.0036	-.0240	-.0186
	(.0012)	(.0035)	(.0025)	(.0024)	(.0018)
Black	-.3760	-.0542	-.3778	-.5114	-.5913
	(.0261)	(.0537)	(.0551)	(.0732)	(.0448)
Other Non-white	-.2290	.1185	-.1676	-.4408	-.1893
	(.0533)	(.1280)	(.1290)	(.1026)	(.0895)
Education	.0721	.0468	.0689	.0711	.0811
	(.0040)	(.0109)	(.0086)	(.0079)	(.0064)
Kids Eligible	.0723	.0786	.0188	.0798	.0903
	(.0110)	(.0269)	(.0243)	(.0221)	(.0187)
Kid > 5 years	.3358	.0867	.2306	.4270	.4669
	(.0209)	(.0513)	(.0493)	(.0438)	(.0343)
SMSA	.0333	-.0207	.0219	.0783	.0369
	(.0233)	(.0635)	(.0612)	(.0398)	(.0395)
Central City	-.1016	-.1063	-.1596	.0032	-.1343
	(.0238)	(.0558)	(.0560)	(.0496)	(.0394)
Unemployment	-.0108	-.0027	-.0410	.0150	-.0214
	(.0071)	(.0186)	(.0186)	(.0128)	(.0120)
Per Capita Income (1000s)	-.0168	-.0389	-.0289	-.0188	-.0046
	(.0062)	(.0133)	(.0157)	(.0116)	(.0112)
AFDC Max Benefit	.0039	-.0284	.0030	.0317	-.0093
	(.0081)	(.0204)	(.0214)	(.0146)	(.0136)
Pop < 18	-1.2373	-11.4865	-1.0393	2.3674	-1.6983
	(1.0938)	(2.8970)	(2.7510)	(1.9784)	(1.8422)
Pop 18-44	-.0246	2.0256	4.0358	-.8127	-1.8208
	(.7953)	(2.0872)	(2.0285)	(1.4064)	(1.3616)
Pop 45-64	-.7972	-7.4334	3.1914	3.0913	-3.8512
	(2.0586)	(5.5966)	(5.5032)	(3.5711)	(3.4776)
Lawyers Per Capita	-.0061	-.0200	-.0078	.0009	-.0073
	(.0025)	(.0047)	(.0058)	(.0089)	(.0044)
Catholic	-.4089	-.2785	-.1859	-.4110	-.4522
	(.1538)	(.3893)	(.4059)	(.2755)	(.2596)
Constant	.6387	2.7873	-2.3435	-1.2968	2.1482
	(.8949)	(2.3228)	(2.2742)	(1.5919)	(1.5165)
CSE Variables Included	[6]	[6]	[6]	[6]	[6]
Region Effects	[8]	[8	[8]	[8]	[8]
Year Effects	[5]	[5]	[5]	[5]	[5]
Log Likelihood	-13281.1	-2108.0	-2264.3	-4019.0	-4640.8

*Standard errors are in parentheses.

Table 5B - Award Equation Estimates: Mean Derivatives

	Full Sample	Never Married	Separated	Remarried	Divorced
Mother Characteristics:					
Never Married	-.4722**	...	...	...	...
Separated	-.2472**	...	...	...	...
Remarried	-.0925**	...	...	...	...
Age	-.0052**	-.0021**	-.0013	-.0086	-.0059**
Black	-.1231**	-.0016	-.1315**	-.1910**	-.2064**
Other Non-white	-.0726**	.0266	-.0575	-.1639**	-.0623**
Education	.0227**	.0102**	.0246**	.0251**	.0251**
Family Characteristics:					
Kids Eligible	.0228**	.0174	.0066	.0281**	.0279**
Kid > 5 years	.1155**	.0183~	.0804**	.1589**	.1573**
SMSA	.0105	-.0044	.0077	.0280*	.0117
Central City	-.0323**	-.0226~	-.0563**	.0011	-.0433**
State Variables:					
Unemployment	-.0034	-.0006	-.0144*	.0053	-.0068~
Per Capita Income (1000s)	-.0053**	-.0081**	-.0102~	-.0067	-.0015
AFDC Max Benefit	.0012	-.0059	.0011	.0112*	-.0029
Pop < 18	-.0039	-.0230**	-.0036	.0084	-.0054
Pop 18-44	-.0001	.0044	.0143*	-.0029	-.0058
Pop 45-64	-.0025	-.0152	.0113	.0110	-.0123
Lawyers Per Capita	-.0019*	-.0042**	-.0027	.0003	-.0023~
Catholic	-.0013**	-.0006	-.0007	-.0015	-.0014~
CSE Variables Included	[6]	[6]	[6]	[6]	[6]
Region Effects	[8]	[8]	[8]	[8]	[8]
Year Effects	[5]	[5]	[5]	[5]	[5]
Mean Award Probability	.5021	.1417	.3664	.6280	.7010
Sample Size	23859	5456	3660	6433	8310

Notes:
This table reports the effect of a unit change in each explanatory variable on the average award probability holding all else constant.
The statistical significance of corresponding the Probit coefficient on each variable is also indicated: Significant at 1% (**); Significant at 5% (*); Significant at 10% (~)

Table 6A - CSE Effects by Marital Status: Probit Coefficients and Standard Errors*

	Full Sample	Never Married	Separated	Remarried	Divorced
Individually Entered:					
EXPEND	.0284	.0837	.0324	.0015	.0168
	(.0081)	(.0190)	(.0202)	(.0152)	(.0138)
STAFF	.0513	.1676	.1711	-.0121	-.0286
	(.0206)	(.0468)	(.0498)	(.0384)	(.0346)
PCTOUT	.1529	.4095	.3095	.0175	.0415
	(.0413)	(.0990)	(.0972)	(.0789)	(.0705)
LOCAL	.0139	.0352	-.0936	.0241	.0278
	(.0237)	(.0574)	(.0595)	(.0433)	(.0402)
PATRATE	.0442	.1547	.0855	-.0089	.0061
	(.0187)	(.0431)	(.0484)	(.0348)	(.0312)
PARLOC	.0144	.1595	.1490	-.0930	-.0431
	(.0301)	(.0730)	(.0781)	(.0544)	(.0503)
Jointly Entered:					
EXPEND	.0237	.0523	-.0048	.0085	.0370
	(.0103)	(.0240)	(.0252)	(.0197)	(.0177)
STAFF	-.0112	.0175	.1356	-.0181	-.0944
	(.0269)	(.0600)	(.0649)	(.0510)	(.0454)
PCTOUT	.1565	.3506	.1698	.0531	.1046
	(.0483)	(.1155)	(.1223)	(.0907)	(.0824)
LOCAL	.0352	.0814	-.0525	.0242	.0392
	(.0260)	(.0637)	(.0690)	(.0466)	(.0442)
PATRATE	.0125	.0581	-.0007	.0043	.0003
	(.0217)	(.0508)	(.0580)	(.0402)	(.0359)
PARLOC	-.0200	.0394	.0729	-.0989	-.0441
	(.0329)	(.0814)	(.0855)	(.0596)	(.0548)
Joint significance test:					
χ^2 Statistic	25.08	34.87	17.60	3.73	7.82
[Prob > χ^2]	[.0003]	[.0000]	[.0073]	[.7131]	[.2518]
Sample Size	23859	5646	3660	6433	8310

*Standard errors are in parentheses.

Notes: All equations include the full set of variables listed in Tables 5A and 5B.

The top half of the table corresponds to estimates of six different equations for each sample, with each equation including a single CSE variable. The bottom half of the tables corresponds to a single equation for each sample with includes all six CSE variables jointly.

Table 6B - CSE Effects by Marital Status: Mean Derivatives

	Full Sample	Never Married	Separated	Remarried	Divorced
Individually Entered:					
EXPEND	.0090**	.0186**	.0115	.0005	.0053
STAFF	.0162*	.0389**	.0619**	-.0043	-.0091
PCTOUT	.0005**	.0009**	.0010**	.0001	.0001
LOCAL	.0044	.0076	-.0330	.0086	.0088
PATRATE	.0139*	.0357**	.0308⁻	-.0032	.0019
PARLOC	.0045	.0370*	.0539⁻	-.0336⁻	-.0138
Jointly Entered:					
EXPEND	.0075*	.0114*	-.0017	.0030	.0116*
STAFF	-.0036	.0038	.0488*	-.0065	-.0305*
PCTOUT	.0005**	.0007**	.0006	.0002	.0003
LOCAL	.0111	.0175	-.0185	.0086	.0124
PATRATE	.0040	.0127	-.0003	.0015	.0001
PARLOC	-.0063	.0085	.0260	-.0357⁻	-.0141
Joint significance test: χ^2 Statistic [Prob > χ^2]	25.08 [.0003]	34.87 [.0000]	17.60 [.0073]	3.73 [.7131]	7.82 [.2518]
Mean Award Probability	.5021	.1417	.3664	.6280	.7010
Sample Size	23859	5456	3660	6433	8310

Notes:
This table reports the effect of a unit change in each explanatory variable on the average award probability holding all else constant. All equations include the full set of variables listed in Tables 5A and 5B.
The top half of the table corresponds to estimates of six different equations for each sample, with each equation including a single CSE variable. The bottom half of the tables corresponds to a single equation for each sample with includes all six CSE variables jointly.
The statistical significance of corresponding the Probit coefficient on each variable is also indicated:
Significant at 1% (**)
Significant at 5% (*)
Significant at 10% (⁻)

TABLE 7 - Participation in AFDC and CSE

	Full Sample	Never Married	Separated	Remarried	Divorced
AFDC Participation Rate	21.97	44.52	30.18	3.65	17.23
CSE Contact Rate, Non-AFDC	22.09	18.89	19.45	23.49	23.24
CSE Contact Rate, Adjusted	39.20	55.00	43.76	26.28	36.49

Definitions:

AFDC Participation Rate	Percent receiving AFDC assistance during the previous year
CSE Contact Rate, Non-AFDC	Percent reporting ever having contacted a CSE agency for assistance, among those who were not on AFDC in the past year
CSE Contact Rate, Adjusted	Percent that had contact with CSE either by receiving AFDC or, if not on AFDC by contacting the agency.

Table 8A - CSE Effects by Education, Age, and Race: Probit Coefficients and Standard Errors*

	Educat. < 12 yrs	Educat. > 12 yrs	Age 18-29 yrs	Age 30-65 yrs	Non-White	White
Individually Entered:						
EXPEND	.0575	.0025	.0568	.0182	.0389	.0214
	(.0171)	(.0153)	(.0145)	(.0099)	(.0156)	(.0096)
STAFF	.1168	-.0279	.1167	.0246	.1117	.0178
	(.0416)	(.0395)	(.0355)	(.0254)	(.0397)	(.0244)
PCTOUT	.2201	.1131	.3487	.0791	.2703	.1079
	(.0851)	(.0809)	(.0742)	(.0500)	(.0841)	(.0482)
LOCAL	.0040	-.0189	.0225	.0058	-.0162	.0219
	(.0497)	(.0469)	(.0420)	(.0288)	(.0463)	(.0279)
PATRATE	.0757	.0047	.1074	.0176	.0487	.0409
	(.0382)	(.0376)	(.0331)	(.0228)	(.0353)	(.0224)
PARLOC	.1094	-.0300	.0724	-.0013	.0473	.0005
	(.0685)	(.0543)	(.0556)	(.0359)	(.0730)	(.0334)
Jointly Entered:						
EXPEND	.0429	.0152	.0382	.0195	.0229	.0247
	(.0221)	(.0195)	(.0185)	(.0125)	(.0197)	(.0123)
STAFF	.0202	-.0733	-.0008	-.0168	.0528	-.0461
	(.0543)	(.0529)	(.0460)	(.0333)	(.0497)	(.0323)
PCTOUT	.1813	.1564	.3352	.0861	.2436	.1293
	(.1005)	(.0937)	(.0861)	(.0587)	(.1015)	(.0560)
LOCAL	.0227	.0023	.0645	.0168	.0189	.0381
	(.0553)	(.0503)	(.0461)	(.0316)	(.0534)	(.0302)
PATRATE	.0225	.0019	.0373	-.0004	-.0062	.0220
	(.0452)	(.0441)	(.0386)	(.0264)	(.0414)	(.0259)
PARLOC	.0373	-.0284	-.0141	-.0163	-.0395	-.0210
	(.0758)	(.0597)	(.0613)	(.0392)	(.0822)	(.0365)
Joint significance test:						
χ^2 Statistic	16.30	4.45	35.63	5.87	15.92	13.24
[Prob > χ^2]	[.0122]	[.6159]	[.0000]	[.4385]	[.0142]	[.0394]
Sample Size	6048	6442	8200	15659	6510	17349

*Standard errors are in parentheses.

Notes: All equations include the full set of variables listed in Tables 5A and 5B.

The top half of the table corresponds to estimates of six different equations for each sample, with each equation including a single CSE variable. The bottom half of the table corresponds to a single equation for each sample with includes all six CSE variables jointly.

Table 8B - Award Equation Estimates: CSE Effects by Education, Age, and Race

	Education < 12 yrs	Education > 12 yrs	Age 18-29 yrs	Age 30-65 yrs	Non-White	White
Individually Entered:						
EXPEND	.0173**	.0008	.0162**	.0060~	.0112*	.0069*
STAFF	.0355**	-.0087	.0336**	.0080	.0328**	.0058
PCTOUT	.0007**	.0004	.0010**	.0003	.0008**	.0003*
LOCAL	.0012	-.0059	.0064	.0019	-.0046	.0071
PATRATE	.0229*	.0014	.0309**	.0058	.0411	.0132~
PARLOC	.0332	-.0094	.0208	-.0004	.0137	.0002
Jointly Entered:						
EXPEND	.0129~	.0047	.0109*	.0064	.0066	.0080*
STAFF	.0061	-.0230	-.0002	-.0055	.0153	-.0150
PCTOUT	.0005~	.0005	.0010*	.0003	.0007*	.0004*
LOCAL	.0068	.0007	.0183	.0055	.0054	.0123
PATRATE	.0007	.0006	.0106	-.0001	-.0018	.0071
PARLOC	.0112	-.0088	-.0040	-.0054	-.0112	-.0068
Joint significance test: χ^2 Statistic [Prob > χ^2]	16.30 [.0122]	4.45 [.6159]	35.63 [.0000]	5.87 [.4385]	15.92 [.0142]	13.24 [.0394]
Mean Award Prob.	.4026	.6096	.3880	.5618	.2791	.5857
AFDC Rate	.3537	.1082	.3590	.1540	.3783	.1668
Sample Size	6048	6442	8200	15659	6510	17349

Notes:
This table reports the effect of a unit change in each explanatory variable on the average award probability holding all else constant. All equations include the full set of variables listed in Tables 5A and 5B.
The top half of the table corresponds to estimates of six different equations for each sample, with each equation including a single CSE variable. The bottom half of the tables corresponds to a single equation for each sample with includes all six CSE variables jointly.
The statistical significance of corresponding the Probit coefficient on each variable is also indicated:
Significant at 1% (**)
Significant at 5% (*)
Significant at 10% (~)

Appendix Table A.1 - Adding State Family Structure Variables
CSE Effects by Marital Status: Probit Coefficients and Standard Errors*

	Full Sample	Never Married	Separated	Remarried	Divorced
Individually Entered:					
EXPEND	.0269	.0793	.0287	-.0005	.0153
	(.0082)	(.0192)	(.0203)	(.0154)	(.0140)
STAFF	.0453	.1617	.1608	-.0209	-.0322
	(.0207)	(.0471)	(.0502)	(.0388)	(.0349)
PCTOUT	.1284	.3680	.2736	-.0001	.0202
	(.0426)	(.1032)	(.1020)	(.0806)	(.0728)
LOCAL	.0120	.0433	-.0788	.0234	.0397
	(.0243)	(.0587)	(.0612)	(.0447)	(.0414)
PATRATE	.0488	.1572	.0880	-.0181	.0161
	(.0192)	(.0443)	(.0496)	(.0362)	(.0321)
PARLOC	.0171	.1639	.1495	-.0890	-.0441
	(.0301)	(.0734)	(.0781)	(.0545)	(.0541)
Jointly Entered:					
EXPEND	.0225	.0497	-.0063	.0089	.0329
	(.0105)	(.0250)	(.0256)	(.0200)	(.0180)
STAFF	-.0123	.0209	.1340	-.0246	-.0921
	(.0270)	(.0613)	(.0651)	(.0512)	(.0455)
PCTOUT	.1273	.3010	.1340	.0420	.0797
	(.0500)	(.1221)	(.1280)	(.0928)	(.0852)
LOCAL	.0331	.0738	-.0514	.0222	.0453
	(.0265)	(.0649)	(.0702)	(.0478)	(.0452)
PATRATE	.0182	.0531	.0001	-.0031	.0166
	(.0230)	(.0541)	(.0614)	(.0430)	(.0381)
PARLOC	-.0170	.0511	.0803	-.0879	-.0501
	(.0332)	(.0822)	(.0865)	(.0600)	(.0552)
Joint significance test:					
χ^2 Statistic	19.90	29.20	14.65	3.25	7.51
[Prob > χ^2]	[.0029]	[.0000]	[.0232]	[.7765]	[.2766]
Number of Observations	23859	5456	3660	6433	8310

*Standard errors are in parentheses.

Notes: This table is comparable Table 6A. All equations here additionally include the state divorce rate, marriage rate, and percent of births to unmarried women, in addition to all variables previously included. The top half of Table A.1 corresponds to estimates of six different equations for each sample, with each equation including a single CSE variable. The bottom half of the tables corresponds to a single equation for each sample with includes all six CSE variables jointly.