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The Distributional Effects of the Tax Treatment of Child Care Expenses

William M. Gentry and Alison P. Hagy

The child care tax credit (CCTC) is the largest federal government program in the United States aimed at helping families with child care expenses.¹ In 1991, over 5.9 million households took the CCTC, costing the government \$2.8 billion in tax revenues (Internal Revenue Service 1993). This paper measures the distributional effects of the CCTC and dependent care assistance plans (DCAPs), an alternative tax-relief program administered as an employee benefit that allows families to pay for child care with pretax income.

The tax credit's critics claim that it is regressive because it benefits middle- and upper-income families without offering relief to less-advantaged families.² Yet, previous research by Dunbar and Nordhauser (1991) and Altshuler and Schwartz (1996) using tax return data shows that the tax credit is progressive. As with any government program targeted at child care, this tax relief will redistribute resources from households without children to households with children. However, as discussed by Altshuler and Schwartz, much of this redistribution cancels out over the life cycle: families with young children may receive tax relief now but will not receive relief when their children are older. Since this type of redistribution is transitory, we focus on measuring the redistribution of benefits within the population of families with children. This redistribution comes from the various tax rules pertaining to tax relief for child

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1. For a review of the numerous government programs aimed at child care, see Robins (1990).

2. See Garfinkel, Meyer, and Wong (1990) for simulations of how various expansions of the CCTC would affect poverty and welfare reciprocity.

care, how child care expenditures vary with income, and differences in family choices regarding child care.

Our primary data source is the National Child Care Survey (NCCS), although when possible we compare our results with those obtained using a sample of tax returns. The NCCS surveys families with at least one child under age 13 and thus isolates a cohort of families with children of eligible ages for tax relief. In addition, the NCCS includes information that is not available from the previously analyzed tax return data. For example, it has information on access and participation in DCAPs and details on family structure, labor force participation, and child care expenses. This information allows us to investigate what family characteristics affect whether a family receives tax relief and, if so, how much tax relief it receives. We can also construct an alternative ability-to-pay measure, "potential labor income," based on wage and individual characteristic data. The advantage of this alternative measure of ability to pay is that it is related to a family's labor market opportunities rather than its preferences for leisure.

Our results suggest that a broad cross section of Americans benefit from tax relief for child care. However, tax relief does not reach the bottom 10 percent of the income distribution primarily because the CCTC is nonrefundable. Despite this regressivity at low income levels, we find that above the bottom quintile of the income distribution, tax relief is progressive: the effective subsidy rate (i.e., tax relief benefits divided by income) steadily declines with income. We attribute this progressivity to a combination of progressive features of the tax rules (e.g., the CCTC rate declines with income) and the income inelasticity of child care expenses. Finally, we find tax relief to be more progressive when we use potential income as a measure of ability to pay.

Among families that receive tax relief for child care expenses, the tax benefits average 1.24 percent of family income. While our results on the progressivity of tax relief indicate that this percentage varies systematically across income groups, tax relief is too small to influence the income distribution dramatically. However, tax relief also varies substantially across families with the same income. This variation within income groups suggests that tax relief for child care changes household tax liabilities (and after-tax incomes), depending on the ages and number of children in the family, marital status of the parents, parent's education, and choice of child care arrangements.

Our results using potential income suggest that household labor supply decisions are an integral part of how tax relief for child care is distributed. By reducing the after-tax price of child care, tax relief for child care can affect the labor market and child care decisions of households. In response to the lower price of child care, families may choose paid care over nonpaid care, a different mode of market-provided care (e.g., child care center vs. family day care home), or a higher-priced option within a particular mode of child care. Reducing the cost of child care may also affect the labor force participation or hours decisions of parents, especially mothers, because it raises the net of child care

wage. To the extent that tax relief induces significant changes in household labor supply and child care decisions, these behavioral responses will have implications for the distributional effects of any changes in the tax treatment of child care.

The remainder of the paper is organized as follows. Section 4.1 briefly describes the different features of tax relief. Section 4.2 discusses various rationales for tax relief for child care. Section 4.3 presents evidence on the progressivity of tax relief, providing a comparison of results from the NCCS and tax return data. Section 4.4 explores the determinants of the distribution of tax relief, including the various rules pertaining to tax relief for child care, how child care expenditures vary with income, and differences in family choices regarding child care. Section 4.5 discusses the results of using potential income to measure ability to pay. Section 4.6 discusses the implications of recent estimates of the demand for child care for how tax relief for child care can affect family behavior. The last section summarizes our results.

4.1 Tax Relief for Child Care

The U.S. income tax code has had special provisions for child care expenses since 1954.³ Initially, work-related child care expenses incurred by low-income families were deductible from the tax base. In 1971, Congress expanded deductibility to cover a broader range of income groups, allowing families with an adjusted gross income (AGI) up to \$27,600 to receive benefits. The Tax Reform Act of 1976 replaced the deductibility of expenses with a flat 20 percent credit for work-related child care expenses. The Economic Recovery Tax Act of 1981 (ERTA) modified the credit by introducing the current declining rate credit. ERTA also introduced DCAPs, which are employer-provided benefits that effectively give some taxpayers the choice between claiming the CCTC and deducting child care expenses from their taxable income. Subsequent tax reforms have made minor changes to the tax relief provisions, but they are substantially the same as enacted in 1981. Below, we describe current features of the tax treatment of child care expenses.

In terms of eligibility, the two tax relief programs, the CCTC and DCAPs, are similar and have several features in common: (1) Only the expenses for children under age 13 qualify. (2) Both parents, or the single parent, must work or be enrolled in school. (3) Child care expenses must be work related. (4) Eligible expenses are limited to the earned income of the parent with the least income.

The programs differ in the amount of eligible expenses, the value of the reduction in taxes, and in their administration. For the CCTC, qualified expenses are limited to \$2,400 for families with one child under age 13 and

3. Wolfman (1984) discusses the legislative history of child care provisions in the tax code and the legal debate surrounding the tax treatment of child care.

\$4,800 for families with more than one child under age 13. The amount of the credit depends on family income and child care expenses. For families with AGI below \$10,000, the credit is 30 percent of qualified expenses. The rate of the credit falls by 1 percentage point for every \$2,000 of AGI until AGI equals \$28,000. For families with AGI above \$28,000, the credit rate is 20 percent. The credit is nonrefundable so the total credit is limited to the family's tax liability.

In contrast to the CCTC, DCAPs are flexible spending accounts by which employees can reduce their pretax income and use the reduction to pay for child care expenses. Employees cannot unilaterally create DCAPs; instead, employers must offer the plans as part of a fringe benefit package. Total family contributions to DCAPs are limited to \$5,000. Contributions are subject to neither income nor payroll taxes. The employee chooses a contribution level at the beginning of the year and contributions are subject to a "use it or lose it" rule: the employee loses any contributions that are not withdrawn for child care expenses during the year. Since DCAP contributions lower taxable income, the DCAP's value roughly equals the family's marginal tax rate times the DCAP contribution.

A dollar of child care expenses cannot be subsidized through both the CCTC and the DCAP. However, using a DCAP does not completely preclude using the CCTC: each dollar contributed to a DCAP lowers the maximum expense qualifying for the CCTC by a dollar. Whether a family benefits more from a DCAP or the CCTC depends on its credit rate and its marginal tax rate. Because higher income families have lower credit rates and higher marginal rates, they may find it advantageous to use the DCAP rather than the CCTC. Consequently, the distribution of tax relief for child care is likely to be even more skewed toward middle- and upper-income families than the distribution of the benefits of the CCTC alone.

4.2 Rationales for the Tax Treatment of Child Care

In discussing the appropriate tax treatment of different items under an income tax, economists often start from the Haig-Simons definition of income: income is the monetary value of increases in potential consumption net of the costs incurred to earn that income. Under this definition, one could argue that work-related child care expenses should be tax deductible. Yet, the Haig-Simons criterion is not so easily applied in this case. For example, from the standpoint of a family with children in which both parents work, child care may be considered a necessary business expense. However, from the standpoint of a family deciding whether to have children, the future costs of child-rearing, including work-related child care, are arguably more a personal consumption decision than a necessary business expense. Despite the ambiguity under the Haig-Simons criterion, it is interesting to note that this argument for tax relief supports deductibility rather than a tax credit.

A broad range of other arguments can be made for and against tax provisions for child care. We divide these normative rationales into two groups: equity and efficiency (or incentive) arguments.

4.2.1 Equity and the Tax Treatment of Child Care

One goal of income taxation is to levy taxes in relation to a household's ability to pay. Yet, annual income is not necessarily a good measure of ability to pay. For example, a two-parent family with both parents in the labor force could have the same inherent ability to pay as a two-parent family with only one parent in the labor force, but its measured income would be different because of its labor supply choices. By giving the two-earner family tax relief for their child care expenses, the tax system makes a crude adjustment for this discrepancy between measured and actual ability to pay. A major flaw in this argument is that targeting child care is an imprecise way of distinguishing between one-earner and two-earner families because many two-earner families do not have child care expenses. A more precise adjustment would be a partial deduction of the earnings of the secondary earner as was the case in the United States in the early 1980s (see Feldstein and Feenberg, chap. 2 in this volume).

Another possible justification for tax relief for child care is that differences in child care expenses drive a wedge between otherwise similar families. For example, the income tax code already recognizes that ability to pay can depend on family size by allowing personal exemptions. However, a uniform personal exemption does not distinguish between families with different costs of raising children, for example, if younger children are more expensive to raise than older school-aged children. Yet, this is more of an argument for making the personal exemption related to age than for special treatment for child care expenses.⁴ Another example would be that some families have access to low-cost, high-quality child care (e.g., care provided by a relative) while otherwise similar families do not have access to such care (see Krashinsky 1981). In this case, tax relief for child care adjusts tax payments to reflect differences in ability to pay driven by variation in the costs of care. Both of these arguments (distinguishing between two-earner and one-earner families and families with different child care expenses) are horizontal equity arguments for tax relief for child care.

In contrast to horizontal equity arguments, the notion of vertical equity is implicit in claims by critics of the CCTC that most of the benefits of tax relief accrue to middle- and upper-income families.⁵ These critics are often most

4. One obvious difference between making the personal exemption related to age and tax relief for child care is that targeting child care increases the chance that part of the additional after-tax income is spent on children. This concern is analogous to the sentiment that some people are more willing to have welfare for children than for parents. Of course, since money is fungible it is unclear whether this targeting changes overall expenditure patterns.

5. See, e.g., the statement of Douglas J. Besharov before the Senate Finance Committee (U.S. Congress 1988).

concerned with the quality of child care in low-income households. Thus, they compare the distribution of benefits generated by direct expenditure programs targeted at low-income families (e.g., Head Start) with the much less targeted tax relief programs. Vertical equity considerations have obviously affected the design of tax relief programs, including the declining credit rate and the limits on qualified expenditures.

4.2.2 Efficiency and Tax Relief for Child Care

In addition to horizontal and vertical equity rationales, tax relief for child care may be justified on efficiency (or incentive) grounds. One of the often-cited goals of subsidizing child care (whether through the tax system or direct expenditure programs) is to improve the quality of care received, particularly by children in low-income families. Society may care about the quality of care received by children in low-income families for equity reasons or because quality care generates social benefits, just as we believe education generates benefits beyond the individual. If these external benefits are large, which may be especially likely for children from disadvantaged families, then subsidizing child care may increase efficiency. Tax relief for child care reduces the marginal cost of care for many working families,⁶ which may encourage families to spend more per hour of care or to purchase more hours of care (if the child does not already have paid care for all of the parents' working hours). Higher-cost care is commonly presumed to be of higher quality. Also, if market-provided care is of higher quality than the alternative form of care (e.g., self-care), then increasing the number of hours of paid care (for a given number of hours of parents' labor supply) increases the quality of care received.

Another often-cited goal of subsidizing child care is to influence the labor force participation and hours-of-work decisions of parents. A common assumption is that parents' labor supply decisions depend on the net-of-tax wage after accounting for child care expenses (the effective wage rate). Tax relief that is tied to labor force participation, under certain assumptions, increases the effective wage rate of the recipient (often the mother).⁷ Thus, tax relief is likely to influence the mother's labor force participation decision as well as her decision regarding how many hours to work. Changes in labor supply could affect efficiency in two ways.⁸ First, as is sometimes argued in the policy de-

6. For families that do not have tax liabilities or exceed the qualified expense limits, tax relief does not affect the marginal cost of child care.

7. In particular, it is necessary to assume that for every hour worked, an hour of child care is needed.

8. For a more detailed efficiency argument, see Krashinsky (1981), which presents a model with household production of child care and adult consumption. In the presence of a wage tax, the deductibility of child care expenses is the largest subsidy that can be justified on efficiency grounds. The optimal child care subsidy rate relative to the marginal wage tax rate depends on the relative elasticities between goods for time in the production of child care and adult consumption. He argues that reasonable assumptions about the substitutability of time and goods for producing child care and adult consumption leads to deductibility being close to optimal.

bate, if the tax treatment of child care induces low-income parents to work, then these parents may learn work skills that lead them to self-sufficiency. Second, for higher-income families, the tax treatment of child care could mitigate some of the inefficiencies created by the current tax treatment of two-income families (see Feldstein and Feenberg, chap. 2 in this volume, for details on possible efficiency gains of alternative tax rules for families).

4.3 Distribution of Tax Relief for Child Care

As discussed above, rationales for tax relief for child care include both vertical and horizontal equity arguments. The limited previous literature has focused solely on vertical equity. In this section, we address the vertical equity of tax relief for child care by evaluating the progressivity of tax relief using new data and a somewhat different methodology. In the next section, to address some of the horizontal equity concerns, we examine the distribution of tax relief for child care across family characteristics, such as marital status and the number of children.

4.3.1 Measuring Progressivity

Tax relief for child care has been criticized as regressive because it is predominantly used by middle- and upper-income families (Robins 1990). Critics point to nonrefundability of the credit as a particularly regressive feature. Yet, other features of the CCTC, such as the credit rate declining with income, are progressive. Contrary to the claims of regressivity, using 1979–86 tax return data Dunbar and Nordhauser (1991) find that the tax system with the CCTC is more progressive than without the CCTC.

Several methodological points may help explain this controversy over the progressivity of the CCTC. First, instead of focusing on families with children, Dunbar and Nordhauser study all households. Therefore, part of the CCTC's progressivity may simply be from the transfer of income from older families to families with children. This redistribution may increase the measured annual progressivity of the tax credit because older families are likely to have higher annual incomes than families with young children, for life-cycle reasons. However, in the long run (assuming the tax credit stays in place), all families with children have an opportunity to qualify for the tax credit when their children are young. The effects of these transfers may be large since 6.5 percent of 1989 tax returns claim the CCTC (Internal Revenue Service 1991–92) compared with 29.9 percent of our sample of families with children.

Altshuler and Schwartz (1996) also examine the progressivity of the CCTC using tax return data. Unlike Dunbar and Nordhauser, they use average income over a number of years as a way of removing some transitory income shocks. Even with this alternative measure of ability to pay, they find results similar to Dunbar and Nordhauser's. Yet, this approach still fails to capture life-cycle differences in income. Altshuler and Schwartz mitigate these life-cycle issues

by restricting their sample to tax returns with dependent children. The NCCS gives us better information on family characteristics for determining whether a family is eligible for tax relief.

Second, Dunbar and Nordhauser use average measures of progressivity rather than estimating progressivity at different points in the income distribution. The CCTC could, on average, be progressive while still being regressive for low income groups. To measure progressivity at different points in the income distribution, we focus on how the average effective subsidy rate varies with income.⁹ The effective subsidy rate is the ratio of dollars of tax relief to household income. The average effective subsidy rate is the mean value of this ratio for the families in each income group. If the subsidy rate increases with income, then tax relief is regressive because higher income families are receiving proportionately more benefits. This measure of tax relief progressivity is the analog to average rate progression commonly used in tax analysis.

Finally, the progressivity of tax relief depends on the relationship between child care expenditures and income. If lower-income families spend a larger fraction of their incomes on child care than higher-income families, then, *ceteris paribus*, a subsidy to child care will be progressive. Unfortunately, the all-else-equal assumption fails to hold: labor force participation, household income, and child care expenses are endogenously determined (see Connelly 1992; Blau and Robins 1988). Therefore, income is a flawed ability-to-pay criterion for measuring progressivity.¹⁰

As an alternative ability-to-pay criterion, we construct a measure of household potential labor income. By eliminating differences in labor supply decisions from the ability-to-pay measure, our potential income measure assigns the same ability to pay to one-earner and two-earner families that have the same labor market opportunities. For the one-earner family, the ratio of actual income to potential income is low relative to the two-earner family. However, the two-earner family is more likely to benefit from tax relief. By treating these two families as equal, using potential income as a measure of ability to pay may reduce the perception that tax relief benefits are concentrated among relatively well off families.

4.3.2 Distribution of Benefits: NCCS Data

The NCCS includes 4,397 families with at least one child under age 13 (see Hofferth et al. 1991 for details on the NCCS). Along with demographic and labor market data, the NCCS has data on the families' child care arrangements. The survey, conducted from October 1989 to April 1990, asked whether the family planned to use the CCTC for 1989, whether either parent had access to

9. Altshuler and Schwartz examine progressivity at different points in the income distribution and find that the CCTC is progressive on average but regressive at low income levels.

10. Atkinson and Stiglitz (1980, chap. 9) discuss the logic of wanting to measure interpersonal differences in ability rather than outcomes for distributional issues.

a DCAP, and if the family used the DCAP, the family's contribution level. We exclude families with missing information on (1) whether they plan to use the credit for 1989, (2) whether they paid for child care, (3) marital status, (4) employment status, (5) household income, or (6) whether they use a DCAP (given that they have access to a DCAP). This leaves a sample of 3,526 families.

The NCCS data have a number of advantages over tax return data. First, the NCCS isolates a cohort of families with children of eligible ages for tax relief. Second, in addition to information on the CCTC, the NCCS has information on access and participation in DCAPs. Third, the NCCS includes details on family structure, labor force participation, and child care expenses. This detailed demographic, labor market, and expenditure data set allows us to separate eligible households from ineligible households. It also enables us to uncover whether certain types of families benefit more from tax relief than others, and it allows us to examine how the income elasticity of child care expenditures influences the distribution of benefits. A disadvantage of the NCCS for studying tax relief is the need to impute tax liabilities and the value of tax relief.

Table 4.1 presents the take-up rates for each type of tax relief by income level. Since some families use both programs, the table also reports the take-up rate for families using either form of tax relief. For the overall sample, 29.9 percent of families claim the CCTC but only 1.6 percent of families use DCAPs. Overall, 30.6 percent of families claim some form of tax relief. This percentage increases with income: 25.6 percent of families with incomes below \$25,000 (about the bottom third of the income distribution) claim tax relief, compared with 30.0 percent of families with incomes between \$25,000 and \$40,000 (roughly the middle third of the income distribution), and 36.5 percent of families with incomes about \$40,000. Tax relief from DCAPs goes to an affluent minority: only 1.6 percent of families use DCAPs but almost two-thirds (63.8 percent) of these families have incomes above \$50,000. Since DCAPs are such a small fraction of total tax relief, the pattern of the take-up rates for the CCTC mirror the take-up rates for all tax relief.

The main reason DCAPs are such a small fraction of tax relief is that few families have access to them. In our NCCS sample, only 7.7 percent of the households (272/3,526) report having access to a DCAP.¹¹ Data from employer-based surveys suggest that more than 7.7 percent of families had access to DCAPs in the late 1980s; Hayes, Palmer, and Zaslow (1990, 203)

11. One problem with self-reported data is that some people may be unaware of whether their employers offer DCAPs. We classify these families as not having access. In part, knowledge of access to DCAPs may be correlated with overall awareness of tax relief programs. In the NCCS data, families with access to DCAPs have a higher propensity to use the CCTC than families without access. While 29.9 percent of all families take the CCTC, 60.3 percent (35/58) of families that use DCAPs also plan to use the CCTC for 1989. For families with access to DCAPs that do not contribute to the DCAP, 41.6 percent (89/214) use the CCTC.

Table 4.1 Tax Relief by Income Level for 1989

Income (thousand \$)	Cumulative Percentage of Income Distribution (1)	Percentage Taking CCTC (2)	Percentage Using DCAP (3)	Percentage with Some Tax Relief (4)	Mean Tax Relief for Families with Tax Relief (\$) (5)	Mean ESR for Families with Tax Relief (6)	Mean ESR for All Families (7)
Under 5	3.4	21.0	0.0	21.0	0.00	0.0	0.00
5-7.5	5.9	15.7	0.0	15.7	0.00	0.0	0.00
7.5-10	9.9	26.4	0.0	26.4	12.00	0.14	0.02
10-12.5	13.3	30.6	0.0	30.6	147.44	1.31	0.30
12.5-15	17.0	24.8	0.0	24.8	309.26	2.25	0.38
15-17.5	20.0	29.0	0.0	29.0	545.86	3.36	0.69
17.5-20	23.5	25.6	0.0	25.6	465.99	2.49	0.46
20-25	35.1	26.8	0.5	26.8	425.53	1.89	0.40
25-30	47.4	27.7	1.2	28.4	404.03	1.47	0.33
30-35	57.7	28.4	0.8	29.0	410.53	1.26	0.28
35-40	67.6	32.8	1.4	33.0	461.41	1.23	0.33
40-45	74.8	26.1	2.0	27.3	484.64	1.14	0.23
45-50	81.2	36.7	0.4	36.7	486.85	1.02	0.30
50-75	93.4	37.8	4.9	40.1	558.19	0.89	0.31
75-100	97.3	44.5	8.0	46.7	617.43	0.71	0.30
100-125	98.3	27.8	5.6	30.6	730.93	0.65	0.16
125-150	99.0	30.4	8.7	30.4	633.14	0.46	0.14
Over 150	100.0	27.8	2.8	27.8	640.44	0.37	0.09
Total		29.9	1.6	30.6	446.02	1.24	0.30

Notes: The sample includes 3,526 families. The take-up rates in cols. (2)–(4) are from responses to questions on whether the family takes the CCTC or uses a DCAP. Cols. (5) and (6) condition on whether a family claims to receive either form of tax relief and reports paying for some regular child care. ESR stands for the effective subsidy rate expressed as a percentage of income. Col. (7) is the ESR averaging over all families and assigning an ESR of zero to families that claim to use tax relief but do not report child care expenses.

report that approximately 14 percent of large and small employers offered DCAPs. More recent data indicate that access to DCAPs is growing rapidly; according to a survey by Foster Higgins, benefits consultants, 45 percent of large employers offer DCAPs (reported in Rowland 1994). Access to DCAPs is skewed toward higher-income households. Relative to families in the bottom third of the income distribution, families in the top third of the income distribution are almost four times more likely to report having access to a DCAP.¹² Furthermore, since DCAPs are less valuable than the CCTC for lower-income households, the DCAP take-up rate among families with access to DCAPs rises sharply with income: 4.8 percent (2/42) of households in the bottom third of the income distribution (and no families with income below \$20,000), 16.3 percent (13/80) of the middle third, and 28.7 percent (43/150) of the top third use DCAPs.

The overall pattern of take-up rates of tax relief reflects several differences between high- and low-income families. First, at very low incomes, the take-up rate is low for working families because they have zero tax liability. Second, low-income families are less likely to work and be eligible for tax relief. However, conditional on all parents in the family working during the previous year, the differences in take-up rates persist (not shown in the table). Third, low-income working families are less likely to use paid child care and be eligible for tax relief. Conditioning on working and paying for child care, the take-up rates are similar across income groups: 50.5 percent of families in the bottom third of the income distribution claim tax relief, compared with 54.2 percent of families in the top third. Thus, differences in family choices regarding child care and labor force participation at least partially explain the distribution in benefits across families of different income levels.

While the take-up rates increase with income, progressivity depends on the relationship of dollars of tax relief to income. Since the NCCS only asks whether a family takes the CCTC and not the value of the credit, we must impute the value of tax relief. First, we calculate the family's tax liability before the CCTC. Since the CCTC is nonrefundable, this tax liability is an upper bound for the value of the tax credit. We start by assuming that a family's AGI is the midpoint of their reported income range. Next, we impute taxable income by assuming that the standard deduction is taken and basing the value of exemptions on the number of people in the household.¹³ The tax liability depends on taxable income and the rate schedule.

12. For the bottom third of the income distribution, 3.4 percent (42/1,237) of households report having access to DCAPs, compared with 7.0 percent (80/1,147) of the families in the middle third, and 13.1 percent (150/1,142) of the families in the top third of the income distribution.

13. The assumption that all families take the standard deduction is unlikely to affect the results because the CCTC subsidy rate is based on AGI, which is calculated before taking either itemized or standard deductions. In some cases, we may understate the effect of the credit being nonrefundable since families with exceedingly high itemized deductions may not have taxable income to offset against the credit. Also, we may overstate the marginal tax rates of some families who itemize, which would overstate the value of their using a DCAP.

The value of the CCTC is the maximum of either the family's tax liability before the CCTC or the product of the family's credit rate and their qualifying annual expenses. The family's credit rate depends on AGI. We assume that all reported child care expenses are work related and qualify for the credit.¹⁴ For families using DCAPs, the value of the DCAP is the family's marginal tax rate times their DCAP contribution. The total value of tax relief is the sum of the values of the CCTC and the DCAP after accounting for the provision that each dollar spent can receive only one form of relief.

Column (5) of table 4.1 reports the average dollar value of tax relief by income level for families claiming tax relief and reporting positive child care expenses during the last year.¹⁵ The average value of all tax relief is \$446 per recipient, while the average value of just the CCTC is \$429 (not shown in the table). The dollar value of tax relief is zero or quite small for families with incomes under \$10,000, reflecting nonrefundability of the CCTC.¹⁶ The value of tax relief rises quickly over the first few income groups and then flattens out over a broad range of incomes. The decline in the value of the credit between \$17,500 and \$30,000 may be partly explained by the credit rate declining with income. In addition, part of the increase in the value of tax relief at the top of the income distribution most likely reflects the increasing propensity to use DCAPs, which are more valuable than the CCTC. We return to explanations for the observed distribution of benefits in the next section.

Column (6) presents the mean effective subsidy rate (ESR) conditional on claiming tax relief. Overall, tax relief for child care is 1.24 percent of the income of those taking the credit. For the bottom quintile of the income distribution, the subsidy rate increases with income suggesting that tax relief is indeed regressive. The ESR reaches a maximum of 3.4 percent of income for the \$15,000–\$17,500 income group. Above this income level, the mean ESR steadily falls with income, suggesting that over most of the income distribution tax relief is progressive.

While the ESR declines with income for families with tax relief (col. [6]), the propensity to receive tax relief increases with income (col. [4]). The prod-

14. The NCCS allowed respondents to report child care expenditures over different intervals (e.g., weekly, monthly, or annually). Therefore, we calculate annual expenditures by multiplying weekly expenditures by 44 and monthly expenditures by 12. The choice of 44 weeks per year is somewhat arbitrary but reflects the fact that most families do not purchase work-related child care every week because of holidays and vacations. The choice of 12 months per year is also somewhat arbitrary. Nevertheless, it reflects our belief that expenditures reported on a monthly basis more accurately reflect days missed than expenditures reported on a weekly basis. As noted below, these assumptions lead to imputed tax credits that are similar to those found in tax return data.

15. The numerator of the take-up rates includes all families claiming to use tax relief. However, some of these families reported having no paid child care during the previous year. We exclude these families from the calculations in cols. (5), (6), and (7) because we cannot impute the value of tax relief.

16. A puzzle in the data is why so many families with low incomes report receiving tax relief when their incomes suggest that the CCTC has no value to them. One possible explanation is that the respondents confused the CCTC with the refundable earned income tax credit.

uct of these two columns (col. [7]) is the unconditional ESR and may be interpreted as the mean ESR for all families.¹⁷ As with column (6), the unconditional ESR increases through the bottom quintile of the income distribution and falls through the rest of the income distribution. Unlike the numbers in column (6), the unconditional ESR is roughly constant between incomes of \$25,000 and \$100,000, which suggests that tax relief is proportional to income through much of the income distribution. Therefore, even without conditioning on receiving tax relief, the tax programs are at least proportional over most of the income distribution of families with children.

4.3.3 Distribution of Benefits: Tax Return Data

In using the NCCS data to measure the distribution of tax relief, we must impute the value of tax relief using self-reported information on income and expenditures. This imputation may differ from the actual tax situation of the household because either income or child care expenses reported on tax returns differ from the survey responses. Since the quality of our data may affect our conclusions, we construct similar statistics to those presented in table 4.1 from tax return data for 1989. The tax return data are from the public-use sample prepared by the Statistics of Income (SOI) Division of the Internal Revenue Service (IRS). In order to be as comparable to the NCCS data as possible, we use a sample of 39,459 tax returns of families with dependent children living at home. As discussed above, tax return data has the advantage of precisely measuring the value of the CCTC but has several disadvantages, such as not being able to isolate a cohort of families with children of eligible age for tax relief or measure tax relief from DCAPs. Therefore, our analysis of tax return data focuses entirely on the CCTC.

Before comparing the distribution of the CCTC in the two data sets, it is instructive to compare the NCCS responses with the aggregate number of families taking the credit reported by the IRS. Using the entire NCCS sample and sample weights that correct for potential nonresponses, the NCCS data imply that 6.01 million families took the credit in 1988 and 7.09 million families planned to take the credit in 1989.¹⁸ In contrast, the SOI tax return samples indicate that 8.82 million families took the credit in 1988 but only 5.92 million

17. The numbers in col. (7) are not exactly equal to the product of cols. (4) and (6) since col. (6) is conditional on the family reporting paid child care expenses. In col. (7), we treat families that claim to receive tax relief but report no paid child care expenses as having an ESR of zero. This assumption may lead to col. (7) understating the mean ESR for all families.

18. We can offer two explanations for the 18 percent increase in claimants between 1988 and 1989 in the NCCS. First, families whose only child was under age 1 at the time of the survey could not have qualified for the CCTC in 1988. This accounts for 430,000 claimants in 1989 but is offset by claimants eligible in 1988 but not surveyed by the NCCS (e.g., families with a youngest child who was 13 years old in 1988). This offset is probably small because families with youngest children aged 13 rarely take the credit. Second, we expect that some respondents who did not know about the CCTC at the time of the survey said that they did not take it in the past but would take it in the future; that is, the NCCS raised these families' awareness of the CCTC.

families did in 1989. The dramatic 33 percent decline in CCTC filers in the tax return data is most likely a response to changes in the tax rules that took effect in 1989 (e.g., claimants were required to report the social security number of the child care provider).¹⁹ In contrast, tax credit benefits grew steadily at an average 19 percent nominal growth rate between 1980 and 1988, and the number of claimants grew by about 10 percent per year according to data from the IRS *Statistics of Income*. Also there is no evidence of any significant change in actual child care arrangements at this time. The proportion of children cared for either by a parent or by a relative stayed about the same between 1985 and 1990 (Hofferth et al. 1991, 101). Thus, the decline in CCTC filers likely reflects reduced tax evasion. That the NCCS coincides with these legislated changes complicates comparisons of the two data sets. Nevertheless, averaging across the two years, the two data sets produce similar numbers of total claimants.

Table 4.2 reports statistics on the distribution of the CCTC from the tax return data.²⁰ For the sake of comparison, table 4.2 reports the same income ranges as in table 4.1; however, here we use each family's reported AGI as their household income rather than the midpoint of their income range as was necessary in table 4.1. In addition, since the tax return data do not precisely identify children's ages, the take-up rates in table 4.2 use all tax returns with dependent children living at home as the denominator.

Despite the differences in the definition of the take-up rate, the take-up rates in the two samples have a similar pattern. It generally increases with income but declines slightly for households with incomes over \$100,000. In addition, the average value of the CCTC is quite similar in the two data sets, though the value of the credit is slightly lower in the tax return data than in the NCCS data (\$404 vs. \$429 per recipient). As with the NCCS data, the tax return data indicate that the dollar value of tax relief is zero or quite small for low-income families and that the benefits rise quickly before flattening out over a broad range of incomes. As a percentage of income, the CCTC rises through incomes of \$15,000 and falls fairly steadily for the rest of the income distribution. While the mean ESR peaks at a lower income in the tax return data, this income level represents a larger fraction of the population than it does in the NCCS data. Thus, the general conclusion that tax relief is regressive at low income levels and progressive for most of the income distribution holds using tax return data, as well as with the NCCS data.

Despite these similarities, there are some notable differences between the two data sets. Unlike the NCCS data, the tax return data do not show a positive

19. The NCCS may not reflect this decline because at the time of the survey the respondents had not yet filed their 1989 tax returns, which would require the information reporting. Also, in responding to the NCCS, families that fraudulently claimed the CCTC might not say that they claimed it on their tax returns.

20. Since the sample oversamples high-income tax returns, we use sampling weights to create statistics that are representative of the overall population.

Table 4.2 CCTC by Income Level for 1989, Tax Return Data

Income (thousand \$)	Cumulative Percentage of Income Distribution (returns with dependents) (1)	Percentage Taking CCTC (returns with dependents) (2)	Mean CCTC for Families Taking CCTC (\$) (3)	Mean ESR for Families Taking CCTC (4)	Percentage for Which Refundability Binds (5)	Percentage for Which Expense Limit Binds (6)	Percentage for Which Earnings Limit Binds (7)
Under 5	5.8	0.00	0.00	0.0	—	—	—
5–7.5	9.9	0.00	0.00	0.0	—	—	—
7.5–10	14.4	2.80	129.49	1.37	66.5	13.9	3.16
10–12.5	19.6	10.09	289.33	2.54	61.2	25.4	3.38
12.5–15	24.7	12.25	412.11	3.02	35.2	27.4	1.41
15–17.5	29.4	16.15	401.97	2.48	15.3	16.6	2.23
17.5–20	33.8	18.56	465.80	2.50	12.4	20.1	4.95
20–25	42.4	20.27	436.04	1.96	3.8	23.2	3.25
25–30	50.1	18.67	388.64	1.41	0.53	22.1	1.56
30–35	57.8	20.64	356.12	1.10	0.41	15.2	2.15
35–40	65.0	18.58	416.64	1.12	0.0	25.3	1.26
40–45	71.6	19.31	374.07	0.88	0.36	17.2	2.59
45–50	76.9	18.58	379.25	0.80	0.0	21.1	1.18
50–75	91.6	21.60	421.90	0.71	0.0	23.5	1.16
75–100	95.9	19.90	445.19	0.53	0.0	27.5	2.13
100–125	97.4	12.56	491.50	0.44	0.0	36.1	2.54
125–150	98.2	12.88	475.98	0.35	0.0	34.7	2.04
Over 150	100.0	9.74	484.19	0.23	0.0	38.6	5.27
Total		15.72	404.06	1.32	5.9	22.2	2.13

Notes: The sample includes 39,459 tax returns from the public-use sample prepared by the SOI Division of the IRS with dependent children living at home. Income ranges refer to AGI. The take-up rates in col. (2) use all tax returns as the denominator. Cols. (3) and (4) condition on whether a family receives a CCTC.

take-up rate at low income levels. This suggests that either the low-income families who claim to receive tax relief in the NCCS answered the tax relief question incorrectly or their AGI exceeds what they reported in the NCCS. At high income levels, the imputations using the NCCS overstate the value of tax relief relative to the tax return data.²¹ Also, in the various income ranges, the mean dollars received can vary substantially between the two data sets. These differences are most noticeable at the tails of the income distribution, where some of the sample sizes are quite small.²²

4.4 Determinants of the Distribution of Tax Relief

Several factors combine to generate the pattern of benefits from tax relief described above. These factors include the various rules pertaining to tax relief for child care, how child care expenditures vary with income, and differences in family choices regarding child care. In this section, we explore each of these determinants of the distribution of benefits from tax relief for child care.

4.4.1 Program Features

In addition to the declining credit rate, these features of tax relief affect the distribution of benefits: (1) nonrefundability, (2) limits on the maximum qualified expense, and (3) the earnings test that limits qualified expenses to the earnings of the parent with the lowest earnings. We examine the first and second of these features with both the NCCS and tax return data; for the earnings test, we use only the tax return data because the earnings data in the NCCS is subject to relatively large measurement error.

Nonrefundability restricts the CCTC's benefits to low-income families with positive tax liabilities. As a consequence, it is difficult to measure how nonrefundability affects the take-up rate. Changing the tax rules may induce several types of behavioral responses, such as more parents working, more children being cared for by paid child care providers, and more families filing tax returns. These behavioral responses may be especially important for families that do not have a positive tax liability. We do not impute any behavioral changes. Instead, we calculate the fraction of families that have a positive tax liability before the CCTC but do not owe taxes after the credit. For these families,

21. A small portion of this difference is from including DCAPs in our measure of tax relief in table 4.2. Since the number of families using both a DCAP and the CCTC is small, the NCCS imputations for just the CCTC are typically similar to the imputations for all tax relief. However, for the \$125,000–\$150,000 income range, the NCCS data suggest a mean value of all tax relief of \$633 for families taking tax relief but a mean value of the CCTC of \$256 for families taking the CCTC. This difference highlights the importance of examining both programs simultaneously.

22. To test whether these differences are statistically significant, we compare the sample of CCTC observations in the two samples with a Mann-Whitney rank sum test for each income range. The null hypothesis of this nonparametric test is that the two samples are drawn from the same distribution. We reject this null hypothesis at the 95 percent confidence level in 8 of the 18 income ranges: \$7,500–\$10,000, \$15,000–\$17,500, and all of the ranges between \$30,000–\$100,000. In these higher-income groups, our imputations from the NCCS overstate the value of the credit, which would tend to bias the results toward finding the credit to be regressive.

nonrefundability binds at the margin. Using the NCCS data, we estimate that half of the families with incomes below \$17,500 with positive tax liabilities before the CCTC paid no taxes after the CCTC. Thus, nonrefundability promotes regressivity at low incomes. The tax return data, in column (5) of table 4.2, suggest that nonrefundability binds less frequently: 29.5 percent of families with incomes below \$17,500 who take the CCTC have a credit that is at least as large as their tax liability before the credit.²³

Qualified expense limits place an upper limit on the amount of tax relief a family can receive.²⁴ Since higher-income families typically spend more on child care, one would expect these limits to have a greater impact on higher-income families. Using the NCCS data, we estimate that the expense limits bind for 29.1 percent of all families. The fraction of families for whom the limits bind increases substantially with income: for families in the bottom third of the income distribution, we estimate that the limits bind for 20.2 percent of families, compared to 35.9 percent of families in the top third of the income distribution. By limiting the benefits of the relatively well-off, these expense limits increase the progressivity of tax relief. As reported in column (6) of table 4.2, the tax return data confirm this result. Overall, the limit binds for 22.2 percent of all families, but it binds for 36.7 percent of families with AGI above \$100,000.

The earnings test could affect the distribution of benefits if secondary earners in certain income ranges tend to have lower earnings than secondary earners in other income ranges. Column (7) of table 4.2 does not suggest a systematic link between the earnings test binding and the level of income. Overall, the earnings test binds for 2.1 percent of families who take the CCTC. This limit binds most frequently for the bottom third of the income distribution and for the highest income groups.

4.4.2 Income Elasticity

The distribution of tax relief benefits for child care also depends on the income elasticity of expenditures. Subsidizing a good at a constant rate can be either progressive or regressive depending on whether the good is income inelastic or elastic. As a simple measure of the income elasticity of child care purchases, we calculate how the median expenditure share varies with income. The median expenditure share for families with child care expenses falls from 9.1 percent in the lowest third of the income distribution to 2.8 percent for the top third. While child care expenditures rise with income, this falling expendi-

23. However, the \$17,500 income cutoff represents 30 percent of the population in the tax return data, compared to only 20 percent of the NCCS sample.

24. For families with only one child under age 13, the DCAP limit of \$5,000 is considerably greater than the CCTC limit of \$2,400. Of the 38 families that report their annual DCAP contributions, 21 have only one eligible child. Of these one-child families, two report contributions of \$2,400 and eight report contributions greater than \$2,400. Thus, for these families, the ability to use the DCAP for more expenses than the CCTC is an important difference between the two programs.

ture share suggests that child care expenses are income inelastic. Thus, it is not surprising that in the portion of the income distribution that faces a constant subsidy rate, we find that tax relief for child care is progressive.

4.4.3 Family Characteristics

While the tax code specifies the maximum value of tax relief, the actual tax benefit a family receives depends on certain family characteristics, such as the number of children, and on the family's labor supply and child care choices. Many of these decisions are endogenous to government policies toward child care. We do not attempt to examine specific behavioral responses with respect to tax policy. Instead, in an effort to address horizontal equity concerns, our goal is simply to uncover whether certain types of families benefit more from tax relief than others. Therefore, in this section, we examine the distribution of tax relief for child care across family characteristics.

A parent's marital status is likely to have a strong influence on the household's labor supply and child care decisions. As a consequence, the benefits of tax relief for child care are likely to vary according to marital status. Table 4.3 presents the NCCS information from table 4.1 for single- and two-parent (married) families. Several differences emerge: First, the income distributions of the two types of households are dramatically different. Over half of single-parent families have incomes below \$17,500, while over half of married households have incomes over \$35,000. Second, 38.4 percent of single parents report receiving tax relief, a substantially higher percentage than the 28.3 percent of married households that report receiving tax relief. This greater propensity to claim tax relief probably means that more single-parent households meet the work requirements than married couples. Third, the mean value of tax relief for married families receiving relief exceeds that of single-parent families receiving relief (\$467 vs. \$392). However, conditional on income, single-parent families typically receive more tax relief than two-parent families. This difference is most prominent at low incomes, where differences in the value of exemptions for single heads of households and married families mean that single-parent families have higher tax liabilities for any given level of AGI. Also, married couples may rely less on market-provided child care than single parents because couples can share child care responsibilities. Finally, the mean ESR for single parents is 1.7 percent of income, much larger than the mean ESR for married couples of 1.1 percent of income. The differences in take-up rates and ESRs suggest that tax relief for child care redistributes income from married households to single-parent households within the cohort of families with children.²⁵

As a way of characterizing the relationships between family characteristics and tax relief for child care, we regress whether a family claims tax relief and

25. In terms of progressivity or regressivity within each sample, the two samples display the same peaked-shape pattern of ESRs as in the combined sample.

Table 4.3 Tax Relief by Income Level for 1989, by Marital Status

Income (thousand \$)	Single				Married			
	Cumulative Percentage of Income Distribution (1)	Percentage with Some Tax Relief (2)	Mean Tax Relief for Families with Tax Relief (\$) (3)	Mean ESR for Families with Tax Relief (4)	Cumulative Percentage of Income Distribution (5)	Percentage with Some Tax Relief (6)	Mean Tax Relief for Families with Tax Relief (\$) (7)	Mean ESR for Families with Tax Relief (8)
Under 5	11.7	21.7	0.00	0.0	1.0	18.5	0.0	0.0
5-7.5	20.1	13.6	0.00	0.0	1.8	21.7	0.0	0.0
7.5-10	31.4	28.1	15.79	0.18	3.7	23.5	0.0	0.0
10-12.5	39.3	38.7	241.08	2.14	5.8	22.0	2.73	0.02
12.5-15	46.3	34.6	423.08	3.08	8.5	17.6	65.47	0.48
15-17.5	51.3	57.5	601.23	3.70	11.0	11.9	296.73	1.83
17.5-20	57.1	44.4	478.45	2.55	13.9	15.0	437.50	2.33
20-25	71.6	46.5	471.84	2.10	24.6	19.1	374.70	1.67
25-30	79.8	47.7	465.38	1.69	38.1	25.0	378.24	1.38
30-35	86.3	41.2	436.88	1.34	49.6	27.0	404.14	1.24
35-40	91.4	50.0	484.11	1.29	60.8	30.8	456.99	1.22
40-45	94.3	52.2	440.63	1.04	69.2	24.8	493.03	1.16
45-50	95.9	53.9	425.87	0.90	77.0	35.7	493.05	1.04
50-75	98.2	61.1	609.52	0.98	92.1	39.2	554.47	0.89
75-100	99.3	62.5	606.40	0.69	96.8	45.7	618.25	0.71
100-125	99.5	0.0	-	-	98.0	32.4	730.93	0.65
125-150	99.6	100.0	0.0	0.0	98.8	27.3	738.67	0.54
Over 150	100.0	33.3	480.00	0.27	100.0	27.3	660.50	0.38
Total		38.4	391.94	1.70		28.3	467.19	1.07

Notes: The sample includes 3,526 families of which 787 are single-parent families and 2,739 are two-parent families. The columns correspond to the columns in table 4.1.

the value of this tax relief (conditional on receiving tax relief) on various family characteristics. We include information on the age of the youngest child in the family, the number of children in each of four age groups (0–2 years old, 3–5 years old, 6–12 years old, and 13–18 years old), the mother's age and number of years of schooling (for families with missing information on the mother, we use the father's age and years of schooling), marital status, whether a relative is available who could assist with child care, the primary child care arrangement of the youngest child in the family, and the logarithm of the midpoint of the family's reported income range.²⁶

Column (1) of table 4.4 presents results from a probit regression of whether a family claims to receive tax relief. The results indicate that a family whose youngest child is older is less likely to receive tax relief. Thus, at a point in time, tax relief is associated with families with younger children. Families with more children tend to be less likely to receive tax relief (though this relationship is not statistically significant for children ages 3–5). Conditional on income, more-educated mothers are more likely to receive tax relief, although this finding may reflect differences in labor force participation based on education levels.²⁷ Consistent with the results in table 4.3, single-parent families are more likely to receive tax relief than two-parent families. Relative to families who report parental care as the primary arrangement of the youngest child (the omitted category), families who use child care centers or family day care homes are the most likely to receive tax relief.²⁸

Column (2) of table 4.4 reports the results from regressing the value of tax relief on family characteristics for families that claim tax relief. The dependent variable is the logarithm of the imputed value of tax relief for the family. The results indicate that families with more younger children receive more tax relief. For example, adding a four-year-old to a family that already receives tax relief will increase their tax relief by 26.2 percent. Again consistent with the results in table 4.3, two-parent families claiming tax relief receive lower benefits than single-parent families claiming tax relief. In addition, families using either child care centers or family day care homes as the primary arrangement for their youngest child receive the largest benefits.²⁹ The model excludes a

26. Since the income variable is reported as a range, we include separate variables for each income group that are equal to the logarithm of the midpoint of the range for people reporting income in that range and zero for families reporting income outside of the range.

27. The interpretation of this coefficient is complicated by the fact that the family's income depends on each parent's labor force participation decision and education level.

28. Since the primary arrangement variable applies only to each family's youngest child but tax relief may result from expenditures on older children, we tried two types of sensitivity analysis. First, we excluded the primary arrangement variables. Second, we used a sample of families with only one child, which required excluding the variables on the number of children in different age categories. For both of these alternative specifications, the remaining coefficients have a similar pattern to the reported results.

29. As with the probit, we estimated two alternative specifications: (1) excluding the primary arrangement variables and (2) using families with only one child but excluding the age category variables. Again, these alternative specifications yield similar results to those reported in table 4.2.

Table 4.4 Regression Analysis of Take-up Rates and Value of Tax Relief

Independent Variable	Take-up Rate Probits (1)	Value of Tax Relief, If Relief > 0 (2)
Youngest child's age	-0.076* (0.015)	-0.021 (0.021)
No. children age 0-2	-0.302* (0.078)	0.179 (0.101)
No. children age 3-5	-0.058 (0.053)	0.262* (0.066)
No. children age 6-12	-0.097* (0.035)	0.012 (0.048)
No. children age 13-18	-0.133* (0.042)	-0.294* (0.066)
Parent's age	0.0001 (0.005)	0.005 (0.007)
Parent's education	0.044* (0.013)	0.032 (0.017)
Married (yes = 1)	-0.405* (0.071)	-0.225* (0.084)
Relative present (yes = 1)	-0.060 (0.055)	0.021 (0.068)
Main arrangement		
Center	1.238* (0.072)	0.811* (0.096)
Relative	0.389* (0.076)	0.463* (0.123)
Sitter	0.540* (0.146)	0.433* (0.182)
Family day	1.222* (0.085)	0.867* (0.106)
Self-care	0.305 (0.226)	-0.560 (0.436)
Other	0.158 (0.099)	0.254 (0.167)
Income 1	-0.003 (0.038)	
Income 2	-0.035 (0.035)	
Income 3	0.008 (0.031)	0.235* (0.043)
Income 4	0.030 (0.031)	0.375* (0.038)
Income 5	0.016 (0.030)	0.454* (0.039)
Income 6	0.042 (0.030)	0.503* (0.038)
Income 7	0.017 (0.029)	0.464* (0.037)
Income 8	0.030 (0.026)	0.468* (0.033)
Income 9	0.043 (0.025)	0.455* (0.033)
Income 10	0.032 (0.025)	0.438* (0.034)
Income 11	0.049* (0.025)	0.464* (0.033)
Income 12	0.036 (0.025)	0.444* (0.034)
Income 13	0.056* (0.025)	0.451* (0.033)
Income 14	0.054* (0.023)	0.444* (0.033)
Income 15	0.064* (0.024)	0.447* (0.033)
Income 16	0.039 (0.030)	0.457* (0.040)
Income 17	0.019 (0.032)	0.454* (0.041)
Income 18		0.426* (0.037)
Intercept	1.027 (0.368)	
Adjusted R ²		0.98

Notes: The sample size is 3,438 for the take-up probit and 764 for the value of tax relief regression. Parental care is the omitted category for primary arrangement. Numbers in parentheses are standard errors.

*Statistically significant at the 95 percent confidence level.

constant but has a full set of income variables because no families in the first two income groups receive tax relief. Conditional on other family characteristics, the income coefficients for the different income variables are typically around 0.44 and do not vary much by income. These coefficients suggest that the elasticity of tax benefits with respect to income is around 0.44, which is substantially less than 1. Again, this finding is consistent with the benefits of tax relief being progressively distributed on average.

4.5 Potential Income as a Measure of Ability to Pay

The results in section 4.4 indicate that the tax relief received by a family depends on its labor market and child care choices. In this section, we reexamine the vertical equity of tax relief using potential income (a measure of labor market opportunities) as a measure of ability to pay. We calculate potential labor income by arbitrarily multiplying each parent's hourly wage rate by 2,600 hours per year (50 hours per week for 52 weeks).³⁰ For parents without wage data (either because wage information is missing or a parent does not work in the market), we impute a market wage by estimating a wage equation using individual characteristics.³¹ We do not include capital income in our measure of potential income for two reasons. First, to some degree differences in capital income arise from differences in households' preferences for the timing of consumption. Since we want to focus on differences in abilities rather than preferences, the concept of potential income should exclude capital income. Second, the NCCS data on capital income is sketchy, so any attempt to include capital income would be imprecise.

We focus on married families to stress the differences between single-earner and two-earner families (or families with one full-time worker and one part-time worker). Using potential income has two effects on the distributional analysis. First, the ranking of households by potential income differs from the ranking by reported income. Second, for the ESRs, it changes the denominator. Since the choice of the maximum number of hours in a year is arbitrary, the scaling of potential income is arbitrary. Therefore, we focus on quartiles of the income distribution rather than absolute income levels.³²

Figure 4.1 compares the take-up rates for married families using actual (reported) and potential income as the ability-to-pay criterion. The take-up rates

30. Since we give each worker the same number of hours, the choice of 2,600 hours per year only introduces an issue of the scale of potential income.

31. In estimating wage equations for mothers, we include data on age, work experience, education, race, county of residence, and squared-values of age, work experience, and education. We correct for biases created by labor force participation by using the two-stage technique outlined by Killingsworth (1983, 148–153). We estimate similar wage equations for fathers, except we do not have data on experience. In cases where the actual wage is missing and the predicted wage is negative, we assign the parent a predicted wage of zero.

32. We approximate the quartiles of reported income for married households as \$0–\$25,000 (24.6 percent), \$25,000–\$35,000 (25.0 percent), \$35,000–\$50,000 (27.4 percent), and above \$50,000 (23.0 percent).

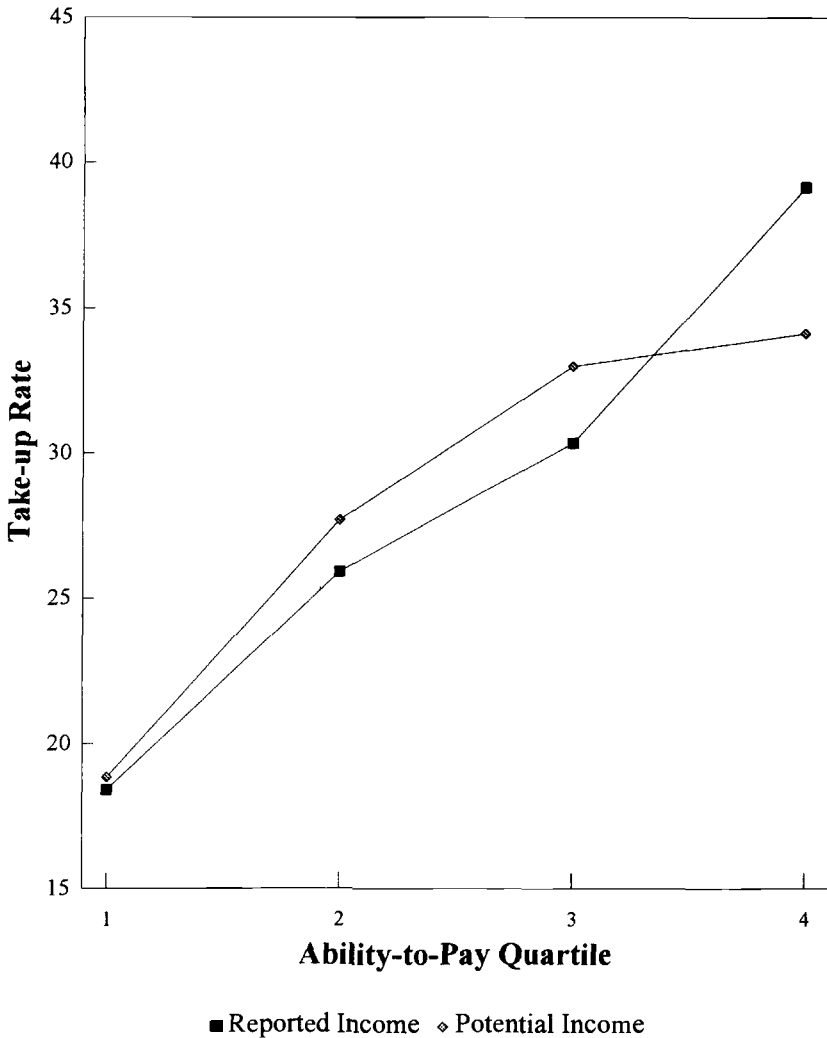


Fig. 4.1 Take-up rates by ability-to-pay criteria

for actual income correspond to those in column (6) of table 4.3. For both measures of ability to pay, the take-up rate increases monotonically with ability to pay. However, the difference in take-up rates between the top and bottom quartiles is smaller when ability to pay is measured by potential income rather than reported income. This difference suggests that part of the pattern of take-up rates in the reported income distribution may come from child care expenses being a cost of having two incomes, which is positively correlated with having a higher reported income.

Figure 4.2 compares the conditional ESR using the different ability-to-pay

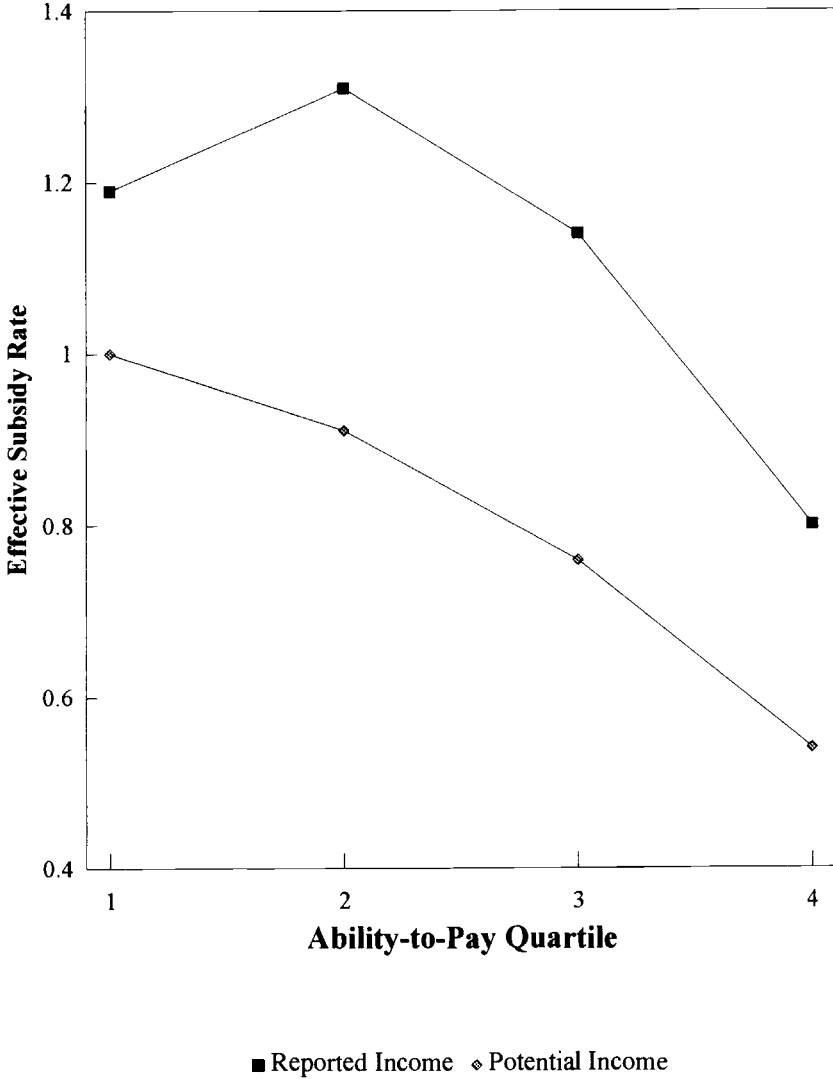


Fig. 4.2 ESRs by ability-to-pay criteria

measures. Since potential income is about two-thirds larger than reported income, the average ESR is about 30 percent lower. When households are ranked by reported income and the subsidy rate is defined using the midpoint of the reported income range, tax relief is regressive at low income levels (the ESR rises with income) but is progressive above the lowest income quartile. Using potential income to measure ability to pay leads to a different conclusion: the ESR falls throughout the distribution of potential income. Furthermore, the percentage difference in the ESR between the top and bottom quartiles is

higher when potential income is the measure of ability to pay. Both of these differences imply that tax relief is more progressive among married families that receive some relief when the measure of ability to pay is potential, rather than reported, income.³³ We interpret this difference as indicating that labor supply decisions are an integral part of how tax relief for child care is distributed.

4.6 Behavioral Effects of Tax Relief for Child Care

By reducing the after-tax price of child care, tax relief for child care can affect the labor market and child care decisions of households. These behavioral effects may be the unintended consequences of tax policy or they may serve certain government policy objectives. As discussed earlier, one of the government's goals in providing tax relief for child care might be to encourage work effort by low-income households. Alternatively, one of the government's goals might be to encourage the purchase of higher-priced, presumably higher-quality, care. Tax relief that is tied to labor force participation and the use of market care (as are the CCTC and the DCAP) has the potential to achieve both these goals.

Tax relief reduces the marginal cost of care and, thus, raises the net of child care wage. For example, of those households paying for care, families with an employed mother spend on average \$1.56 per hour of care (Hofferth et al. 1991, 133).³⁴ Nearly 64 percent of employed mothers pay less than \$1.50 per hour, whereas only 2 percent pay \$5.00 or more per hour (Hofferth et al. 1991, 133). On the other hand, employed mothers of preschool-age children earn a median wage of \$8.17 per hour, while 25 percent of employed mothers earn less than \$5.50 per hour, and 75 percent earn less than \$12.50 per hour.³⁵ Thus, for a mother earning the median wage, paying the average hourly child care cost and facing a marginal tax rate on labor income of 25 percent from the combined state and federal income and payroll taxes, a 30 percent tax credit raises the after-tax net of child care wage approximately 10 percent.³⁶ The question for tax policy is whether the tax relief programs are likely to induce significant changes in family labor market and child care decisions. To the extent that tax relief induces significant changes in household behavior, these

33. Examining the unconditional ESRs (the product of the take-up rates and the conditional mean ESRs) confirms the result that tax relief is more progressive when ability to pay is measured by potential income. For reported income, the distribution of the unconditional ESR is 0.22 (bottom quartile), 0.34, 0.35, and 0.31. For potential income, this pattern is 0.19, 0.25, 0.25, and 0.18. However, even with potential income as the measure of ability to pay, the unconditional mean of the ESRs suggests some regressivity at low ability-to-pay levels.

34. This figure represents expenditures for the primary arrangement of the youngest child under age 5.

35. These figures are based on the authors' calculations using the full sample from the NCCS.

36. This percentage increase in the wage is calculated as $(0.30)(\$1.56)/[(1 - 0.25)(\$8.17) - \$1.56]$.

behavioral responses will have implications for the distributional effects of any changes in the tax treatment of child care.

The literature on the behavioral effects of child care subsidies has been fairly limited until recently. The pioneering study in this field is by Heckman (1974). Heckman's research, which relies on an indirect measure of child care costs, provides the first evidence of a potentially large effect of child care costs on mothers' labor force participation. However, it was not until a study by Blau and Robins (1988) that direct evidence was found that child care costs have a significant effect on married women's labor supply as well as the demand for market care. Using data from the 1980 baseline household survey of the Employment Opportunity Pilot Projects (EOPP), Blau and Robins estimate a model of family labor supply incorporating both market and nonmarket care. They estimate the price elasticity of employment to be -0.38 and the price elasticity of market care to be -0.34 .

Using data from the 1984 Panel of the Survey of Income and Program Participation (SIPP), more recent studies by Connelly (1992), Ribar (1992), and Michalopoulos, Robins, and Garfinkel (1992) confirm the results of Blau and Robins. The results of all of these studies are summarized in table 4.5. Connelly examines the effect of child care costs on married women's labor force participation and finds the participation rate to be sensitive to the average cost of child care. In particular, she estimates the price elasticity of employment to be -0.20 . Connelly does not examine the decision to purchase market care.

Ribar analyzes the demand for market and nonmarket care as well as the decision of married women to enter the labor market. He too finds that hourly child care costs have a negative effect on the labor force participation rate of married women and on their decision to purchase market care. However, Ribar estimates elasticities considerably larger than those in previous studies. In particular, he estimates the price elasticity of employment to be -0.74 and the price elasticity of market care to be -1.86 . Ribar suggests that the smaller elasticities found in the previous studies are the result of using expenditures per week or per hour of work rather than expenditures per hour of care per child. Thus, he asserts the previous studies captured combinations of cost and utilization effects.

Finally, Michalopoulos et al. estimate a structural model in which the decision to purchase market care is made simultaneously with the mother's decision to participate in the labor force.³⁷ Michalopoulos et al. find price effects on women's labor supply considerably smaller and price effects on child care expenditures greater than the effects estimated by other researchers. However, it should be noted that, in contrast to the other studies reported here, Michalopoulos et al. calculate elasticities for mothers who already work and purchase care rather than for the full sample of women. Michalopoulos et al. estimate

37. Ribar (1992) employed a partially structural approach in which a reduced-form labor supply equation and structural child care demand equations are estimated.

Table 4.5 Behavioral Effects of Tax Relief for Child Care

Study	Data	Estimated Elasticity of Employment	Estimated Elasticity of Market Care
Blau and Robins (1988)	1980 Baseline household survey of the EOPP	-0.38	-0.34
Connelly (1992)	1984 Panel of the SIPP	-0.20	-
Ribar (1992)	1984 Panel of the SIPP	-0.74	-1.86
Michalopoulos et al. (1992) ^a	1984 Panel of the SIPP	0.0018 ^b	0.2049 ^c

^a In contrast to the other studies, the Michalopoulos et al. results are for mothers who already work and purchase child care.

^b Estimated elasticity of hours worked with respect to child care subsidy rate.

^c Estimated elasticity of child care expenditures with respect to child care subsidy rate.

the elasticity of hours worked with respect to the child care subsidy rate to be 0.0018 and the elasticity of child care expenditures to be 0.20.

Since Michalopoulos et al. employ a structural model to estimate the employment decision of the mother and the decision to purchase market care, they are able to estimate directly the effect of a change in child care subsidies on child care expenditures and mothers' labor supply. In particular, the structural estimates are used to simulate the effects of proposed changes to the child care tax credit. Since nonrefundability has been criticized as a particularly regressive feature of the CCTC, Michalopoulos et al. simulate the effects of making the CCTC refundable. In addition, they simulate the effects of making the declining subsidy rate (a progressive feature of the CCTC) more progressive.³⁸ They find the behavioral response to the refundable credit to be small, while the effects of the more progressive credit are more pronounced. In addition, most of the behavioral response is an increase in child care expenditures rather than an increase in labor supply. For example, among married mothers there is a 21.1 percent increase in hours worked and a 508 percent increase in child care expenditures.³⁹

Henderson (1989) points out that if the labor market effects are large enough, tax relief for child care could pay for itself through the higher labor income taxes collected on the additional labor supply. This argument depends on the size of the labor market response, the magnitude of the subsidy, and the marginal tax rates on labor income. Using labor supply estimates from Blau and Robins (1988), Henderson calculates that by eliminating the CCTC, the government's revenue gain would be less than half the static estimate of the tax expenditure because families would reduce their labor supply and pay less in income and payroll taxes.

4.7 Conclusion

The tax treatment of child care expenditures is a complex area of tax policy. The debate over how to design these policies addresses issues of horizontal and vertical equity as well as questions of efficiency. We examine the distributional effects of the tax treatment for child care within this framework.

By evaluating the progressivity of tax relief, we address concerns regarding the vertical equity of tax relief. Using reported income as the measure of ability to pay, our results support both the critics of child care tax relief and previous research that finds the child care tax credit to be progressive: among a sample of families with children, tax relief is regressive through the lowest quintile of

38. In particular, Robins has proposed a refundable credit with a credit rate of 80 percent for families with incomes below \$10,000. He has proposed gradually reducing the rate to 20 percent for families with incomes of \$40,000 and phasing it out entirely for families with incomes exceeding \$60,000.

39. The behavioral response is even more pronounced for single mothers.

the income distribution but progressive throughout the remainder of the income distribution. The regressivity at low income levels is primarily driven by nonrefundability of the credit, while the progressivity is driven by a combination of program features, including the declining credit rate and limits on qualified expenses, and the income inelasticity of child care expenses. When potential income is used as the measure of ability to pay, the benefits of tax relief appear progressive throughout the income distribution. This difference in conclusions from using the different ability-to-pay standards emphasizes the importance of defining which families are similar for interpreting equity issues.

To address some of the concerns regarding the horizontal equity of tax relief, we examine the distribution of benefits across family characteristics. We find single-parent families are more likely to receive tax relief and, conditional on income, receive larger amounts of tax relief. In addition, among families with at least one child under age 13, the probability of using the CCTC or a dependent care assistance plan decreases with the number of children. However, conditional on receiving tax relief, the value of tax relief increases with the number of children under age 13, and this increase depends on the age of the child. As one might expect, families with preschool-age children receive larger benefits than families with school-age children. Finally, larger tax relief benefits accrue to families who use child care centers or family day care homes as the primary arrangement for their youngest child than to families who use other modes of care.

Clearly, differences in family labor market and child care decisions are important in determining the distribution of benefits from the current tax policy. Econometric studies of women's labor supply and child care decisions suggest that tax policy can have substantial behavioral effects. These behavioral responses will have implications for the distributional effects of any changes in the tax treatment of child care.

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Comment Brigitte C. Madrian

In this paper, Gentry and Hagy examine the effective tax subsidies that result from two mechanisms designed to provide tax relief for child care expenditures: the child care tax credit and dependent care assistance plans. The paper pursues two courses of inquiry: (1) calculating the distribution of the tax subsidy and (2) examining the determinants of tax relief. Several interesting findings emerge from the analysis. First, the distribution of the tax subsidy when calculated on the basis of reported income suggests that child care tax relief is regressive in the lower tail of the income distribution. When it is calculated on the basis of potential income, however, the tax subsidy is progressive throughout the income distribution. Second, single-parent families profit more from these tax subsidies than do two-parent families: they are more likely to claim tax relief and, conditional on income, receive larger benefits. Finally, families

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with more children are less likely to receive tax relief, but conditional on receiving tax relief, benefits increase with family size.

This paper presents a careful and comprehensive analysis of how tax relief for child care expenditures is currently distributed. In my remarks, I would like to extend the discussion about the progressivity or regressivity of these tax subsidies to alternative scenarios that could affect the actual distribution of benefits. First, I will consider how *potential* tax benefits are related to the progressivity of child care subsidies. Then I will discuss the progressivity implications of a child care tax subsidy designed in response to the equity and efficiency arguments that call for having tax relief for child care expenditures.

Current Tax Relief for Child Care Expenditures

Gentry and Hagy begin where any paper on tax policy should begin: by describing the tax rules pertinent to the discussion. The government currently provides such tax relief through two different means—the child care tax credit (CCTC) and dependent care assistance plan (DCAPs). As discussed in the paper, there are many common features to these two tax relief programs: qualifying expenditures must be on behalf of children under age 13, expenses must be work related, parent(s) must be working or enrolled in school, and eligible expenditures are limited by earned income.

There are other features that distinguish these two programs. Like other tax credits, the CCTC can be claimed by anyone with qualifying expenditures simply by attaching the appropriate form to the personal income tax return. In contrast, DCAPs are an employee benefit, like health insurance and pensions, and eligibility to participate is thus limited to those whose employers provide this benefit. The maximum level of expenditures eligible under a DCAP is constant for all individuals, while the level of eligible expenses under the CCTC is higher for families claiming expenditures for two or more children than for families with only one eligible child. Like other tax credits, the CCTC reduces an individual's tax liability directly. In contrast to the earned income tax credit, however, the CCTC is nonrefundable. The extent of the CCTC is thus limited by an individual's pre-CCTC tax liability. By comparison, the DCAP provides tax relief indirectly by reducing an individual's taxable income. The value of the CCTC is determined by a statutory subsidy rate that declines with income over a certain range. The value of a DCAP, in contrast, increases with an individual's marginal tax rate.

Although the main focus of Gentry and Hagy's paper is to calculate the distribution of the tax subsidy associated with the CCTC and DCAPs, it never shows exactly what the potential tax savings associated with these two programs are and how they compare. To illustrate the differences in the tax savings associated with the CCTC and a DCAP, figures 4C.1 through 4C.3 plot the tax relief available through the CCTC and a DCAP for a married couple filing jointly, assuming that all income is labor income (the value of the earned income tax credit is ignored in these figures). Figure 4C.1 assumes that the

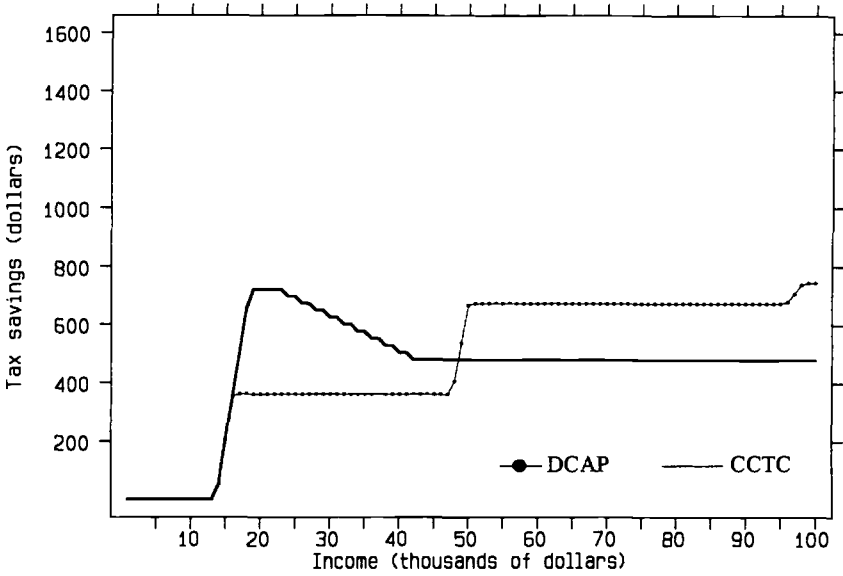


Fig. 4C.1 Tax savings comparison: CCTC vs. DCAP (one child, \$200 monthly expense)

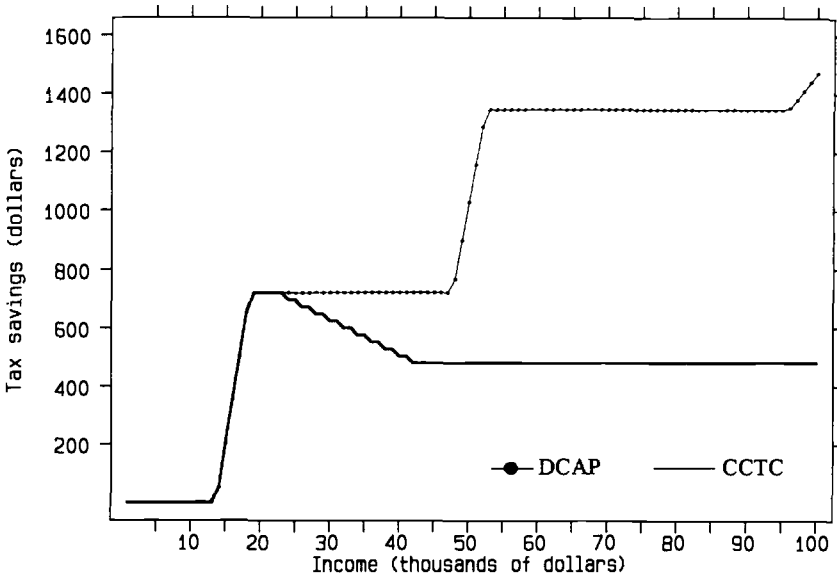


Fig. 4C.2 Tax savings comparison: CCTC vs. DCAP (one child, \$400 monthly expense)

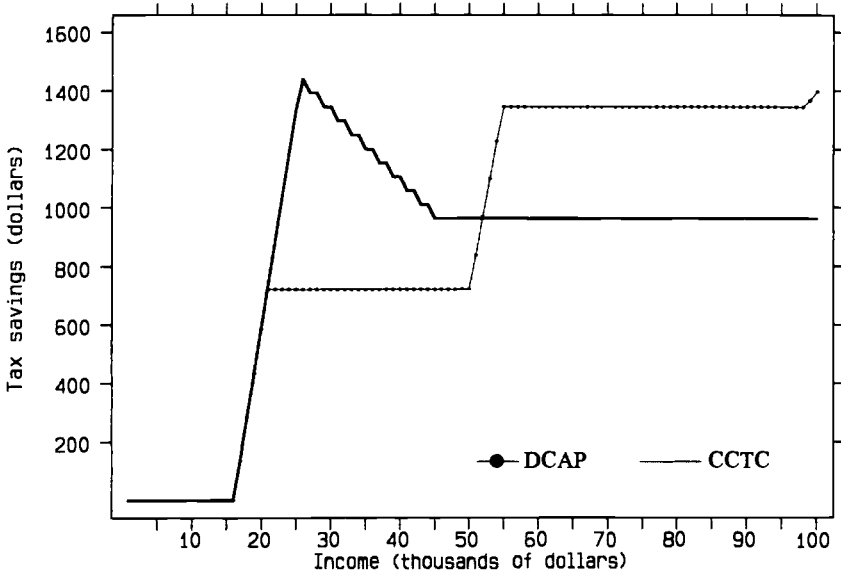


Fig. 4C.3 Tax savings comparison: CCTC vs. DCAP (two children, \$400 monthly expense)

couple has \$200 per month in expenses for one child, figure 4C.2 assumes \$400 per month in expenses for one child, and figure 4C.3 assumes \$400 per month in expenses for two children. These graphs highlight some of the differences between the two programs. Note that neither program offers *any* tax relief to low-income families who have no tax liability initially. As can be seen in all three graphs, the tax savings offered by DCAPs increases with income as marginal tax rates increase. In contrast, the tax savings associated with the CCTC is either falling or constant as income increases, except for a very narrow income range over which the value of the CCTC increases.

In figure 4C.1, for a family with one child and \$200 per month in child care expenditures, the maximum tax savings offered by both a DCAP and the CCTC is about \$750 annually.¹ For middle-income families the CCTC provides greater tax relief, while at higher levels of income a DCAP provides greater tax relief. Thus, which program is “better” at reducing tax liability depends on the level of family income. If monthly expenditures rise to \$400 per month (fig. 4C.2), however, the picture changes dramatically. While the tax savings derived from the CCTC remains the same, the tax savings of the DCAP increases, reaching a maximum of about \$1,500 per month. Moreover, at this higher level of child care expenditures, a DCAP provides greater tax savings

1. Note that in all three figures, the value of a DCAP may be somewhat less than the actual tax savings graphed, to the extent that the “use it or lose it” feature of a DCAP creates uncertainty.

than the CCTC throughout the income distribution. With two children and \$400 per month in child care expenditures (fig. 4C.3), the picture changes once again. In this case, the value of a DCAP is the same as it was in figure 4C.2, while the maximum tax savings provided by the CCTC increases to about \$1,500. As in figure 4C.1, the CCTC is more valuable than a DCAP for middle-income families, while the reverse is true for high-income families.

These figures suggest that the resulting distribution of the tax subsidy provided by these two programs will depend on a number of factors, such as the extent to which DCAPs are provided by employers, especially for high-income families; the number of children that each family has placed in child care; how much families at various points in the income distribution spend on child care; and the actual distribution of family income. The actual distribution of the tax subsidy as calculated by Gentry and Hagy may therefore be expected to change as these factors which translate the potential tax savings into actual tax savings also change. Increased availability of DCAPs will tend to make the tax subsidy more regressive, especially if families have only one rather than two or more children in child care. Similarly, if the distribution of income shifts so that more families have sufficiently low income that they receive no tax savings from either program, the distribution of the tax subsidy will appear more regressive. In contrast, the tax subsidy will become more progressive as utilization of the CCTC increases, either because more families have sufficient income that they have positive tax liability in the absence of any child care expenses or because DCAPs are not available or offer less tax savings than the CCTC.

Designing Tax Relief for Child Care

After reviewing the nature of both the CCTC and DCAPs, Gentry and Hagy consider the various equity and efficiency rationales for providing tax relief for child care. I would like to pick up where they leave off and consider how these rationales for the provision of tax relief inform the discussion about the appropriate design of such tax relief and what they imply about the distribution of tax relief. I should first note that if all child care expenditures are considered a consumption expense, merely one more of the many costs associated with having children, then there is *no* rationale for tax relief. If, however, we believe that child care is more than just a consumption expense, there are a number of issues to be considered in designing tax relief for child care. Should tax relief be provided through a credit, such as the CCTC, or a deduction, such as a DCAP? If through a credit, should the credit be refundable? Should tax relief be unlimited, or capped (as are both the CCTC and DCAPs)? If capped, on what factors should the cap depend? Number of children? Age of children? Should expenditures on all forms of child care be eligible for tax relief?

One commonly cited rationale for tax relief is that child care expenditures represent a cost of doing business, and this cost should be deducted from taxable income just as other costs of business can be (or should be) deducted from taxable income. This justification for tax relief suggests that relief should come

in the form of a deduction from taxable income rather than as a tax credit. It should be noted that many other so-called costs of doing business are not currently deductible from taxable income: travel costs for getting to and from work are not deductible, regular meals are not deductible, clothing costs (other than for uniforms) are not deductible, and other miscellaneous expenses are only deductible for those who itemize to the extent that they exceed 2 percent of adjusted gross income (unless an individual is self-employed).

One reason that many of these other work-related expenses are not deductible is that to some extent, they represent personal consumption: transportation costs are related to personal decisions regarding where to live and how to get to work; the costs of clothing and meals are likely to reflect personal tastes. Even if child care expenditures do represent a cost of doing business, they are likely to reflect some degree of consumption as well: child care providers furnish meals, diapers, and toys in addition to supervision. In addition, many forms of child care also come with large “educational” or “entertainment” components that certainly represent parental consumption decisions. The degree of consumption associated with child care is likely to be reflected in the price of child care, as the cost of better-trained providers and expensive outings is passed on to the parents who purchase these types of care. There are two ways that one could account for these consumption expenditures in the design of tax relief. One would be to make expenditures only partially deductible. A second, and perhaps more appropriate, way would be to limit the extent to which child care expenses are deductible to the expenditure level that buys basic supervision without the frills.² Note that both the CCTC and DCAPs have such limits.

Because there are additional costs incurred from placing additional children in child care, any limit on expenditures should be related to the number of children (the CCTC currently provides a double credit for two- relative to one-child families; DCAPs do not depend on the number of children).³ And because older children are in school most of the day, a limit in excess of the cost of after-school supervision will result in subsidies for consumption activities. Thus expenditure limits should also vary with the age of children.

A second rationale for providing tax relief for child care expenditures is that, empirically, women with small children have higher labor supply elasticities than either men or women without children. On efficiency grounds, these women should face lower marginal tax rates. Tax subsidies for child care represent a way to effectively lower the cost of working for those individuals who are likely to have the most elastic labor supply.⁴ This rationale for tax relief

2. There may be a separate rationale for wanting to subsidize educational expenditures on young children.

3. If there are economies of scale in child supervision, then the increase in the limit on allowable expenditures should decline with each additional child.

4. An alternative way to do this is through a secondary earner deduction (Feldstein and Feenberg, chap. 2 in this volume). Note that tax relief for child care expenditures may actually be more efficient than a secondary earner deduction if having a high labor supply elasticity results more from having children than from being married.

does not speak so clearly to the issue of whether relief should be provided through a credit or a deduction. That labor supply elasticities tend to increase with income, however, suggests that a deduction may be favored on efficiency grounds as well. Because participation elasticities are greater than hours elasticities, efficiency arguments also favor a limit on the level of tax relief. If labor supply elasticities decrease with the number of children, efficiency arguments call for a limit that increases with the number of children as well.

Overall, then, the equity and efficiency arguments in favor of tax relief suggest that child care expenditures should be deductible from income. There should, however, be a limit on the level of expenditures that are deductible, although this limit should vary with both the age and the number of the children in child care. While most of these features are reflected in either the CCTC or a DCAP, neither program combines them all. Under a DCAP, expenses are deductible from taxable income up to a certain limit, but there are no adjustments for the age or number of children. DCAPs also have the bizarre “use it or lose it” feature, for which I am hard pressed to find any rationale, and they are only available for a small subset of the population. The CCTC, on the other hand, is available to all but is a credit rather than a deduction. I can think of no justification for having either or both of the two different types of tax relief currently available.

What are the distributional implications of an “ideally” designed type of tax relief? In a progressive tax system, tax deductions are more regressive than tax credits. Thus, a move away from the CCTC, the form of tax relief that is used predominantly now, and toward something with the deductibility features of a DCAP will make the distribution of tax relief for child care more regressive than it currently is. A limit on the level of deductible expenditures, however, will make the distribution of tax relief progressive over the income ranges in which the expense limits are likely to bind, and a lower expenditure limit will impart greater progressivity. As shown in table 4.2 of the Gentry and Hagy paper, the expense limit binds for only about 35 percent of families with incomes greater than \$100,000. This suggests that there may be considerable scope to make the distribution of tax relief more progressive by lowering the level of deductible expenditures without compromising the equity and efficiency arguments that call for relief in the first place.