

# *Potential Income and the Equity of the Child-Care Expense Deduction*

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## **PRÉCIS**

Certains opposants au système actuel de déduction pour frais de garde d'enfant allèguent que cette déduction ne respecte pas les principes d'équité horizontale et verticale. Toutefois, l'auteure constate que cet argument n'est en général pas justifié si ces principes d'équité postulent que la « capacité de payer des impôts » doit être évaluée en fonction du revenu potentiel du ménage et non en fonction de son revenu réel. Le revenu potentiel correspond au revenu que les parents pourraient gagner s'ils travaillaient à temps plein (aux taux de salaire « prédits ») alors que le revenu réel est calculé en fonction des heures habituellement travaillées. L'auteure soutient que le revenu potentiel mesure mieux la capacité de payer parce que, contrairement au revenu réel, il reconnaît la valeur marchande du temps de loisir et de la production domestique.

Pour étudier cette question, l'auteure utilise les données de l'enquête nationale canadienne sur la garde des enfants de 1988. Ces données sont utilisées avec le système fiscal de 1988 et mises à jour de sorte à être compatibles avec le système fiscal de 1999. L'équité verticale est évaluée en comparant les avantages fiscaux reliés à la déduction pour frais de garde d'enfant chez les ménages à deux revenus qui ont des caractéristiques similaires mais gagnent des revenus de niveaux différents. L'équité horizontale est évaluée en mesurant l'impact de la déduction pour frais de garde d'enfant sur le taux d'imposition des divers ménages. Les mesures du revenu réel et du revenu potentiel servent à mesurer l'équité tant verticale qu'horizontale.

Cette analyse offre un nouvel éclairage sur la polémique qui s'est engagée récemment au Canada au sujet du traitement fiscal des frais de garde, et remet en question certaines vues très répandues sur la question du caractère (in)équitable de la déduction pour frais de garde d'enfant.

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## ABSTRACT

Critics of the child-care expense deduction (CCED) contend that it violates principles of horizontal and vertical equity. The author finds, however, that when equity is evaluated using potential rather than actual income as the measure of ability to pay, this contention does not generally hold. Potential income measures the income that parents would earn if they worked for pay full-time at their predicted wage rate, while actual income is estimated using parents' usual hours of work. The author argues that potential income is a superior measure of ability to pay because, unlike actual income, it recognizes the market value of leisure and home production.

The author uses data from the 1988 Canadian National Child Care Survey to examine these issues. The data are used with the 1988 tax system and aged to be used with the 1999 tax system to evaluate equity. Vertical equity is assessed by comparing CCED benefit rates for dual-earner parents with child-care costs who have similar characteristics and different income levels. Horizontal equity is examined by looking at the effect of the CCED on tax rates for families. Measures of actual and potential income are used to evaluate both vertical and horizontal equity.

The analysis adds new perspectives to the Canadian debate on child-care-related expenditures and challenges some widespread perceptions about the (in)equity of the CCED. **Keywords:** Child care; personal income taxes; social policy; tax deductions; tax expenditures; tax policy.

## INTRODUCTION

The existence and extent of the child-care expense deduction (CCED) available to Canadian taxpayers have been a source of controversy for some time. During the 1999 federal budgetary debates, opposition parties attacked the deduction for its apparent violation of horizontal equity. They argued that two-parent families with a stay-at-home parent were not entitled to the deduction and thus were being discriminated against. Child-care funding supporters have also viewed the CCED less favourably than other forms of child-care funding, because it results in higher tax savings per dollar spent on child care for higher income earners than for lower income earners. That is, the CCED is seen to violate vertical equity.

This article examines the horizontal and vertical equity of the CCED. To assist in the evaluation, I use data from the 1988 Canadian National Child Care Survey and the 1988 Labour Market Activity Survey to simulate tax benefits for Canadian families with children under the age of 7,<sup>1</sup> based on parental earnings and child-care cost estimates. Benefits are simulated for 1988 and 1999. Estimated parental earnings and child-care costs for 1988 are aged to simulate benefits for 1999. Equity is evaluated using (predicted) potential and actual parental earnings as measures of ability to pay. Potential income<sup>2</sup> is defined as the greater of a parent's predicted actual earnings and her predicted earnings based on a 37.5-hour work-

week. I argue that potential income is a superior measure of ability to pay because, unlike actual income, it better describes families' opportunities by recognizing the value of leisure and household production.

The article is structured as follows. In the second section I describe how CCED rules have evolved since the inception of the deduction in 1972. In the third section I adopt working definitions of vertical and horizontal equity and examine related literature. In the fourth section I examine how an increase in the ceiling on eligible expenditures in 1988 affected different income groups and the proportion of income that claimants in different income groups spent on child care in 1987 and 1988. In the fifth section I describe the procedure used to estimate annual child-care costs and predicted and potential income. In the sixth section I analyze how the CCED fares in terms of vertical and horizontal equity. The appendixes that follow the conclusion set out my estimates and methodologies in detail.

### THE CANADIAN CHILD-CARE EXPENSE DEDUCTION

The CCED is a deduction in the calculation of net income for tax purposes. To qualify for the deduction, a taxpayer must incur child-care expenses to permit the taxpayer or a supporting person of the child to pursue employment, business, training, or research activities.<sup>3</sup> In effect, the deduction recognizes the expense necessary to earn income or engage in human capital investments, and thus reduces taxable income.

The CCED was introduced in the 1972 taxation year. Until 1983, the deduction was available to women with earned income.<sup>4</sup> Men could also claim the deduction if they were widowers, divorced, or separated (and also, starting in 1974, never married), or if the children's mother was incapable of caring for the children for any period during the taxation year. The deduction could be claimed by individuals with earned income, whether the income was from employment or from training in respect of which a grant was received. It was available for child-care expenditures for children under 14 years of age. The maximum claim was limited to the lesser of an amount per child times the number of eligible children (up to four per family) and two-thirds of earned income. Per child and/or total family limits were adjusted in 1976, 1983, 1988, 1993, and 1997.<sup>5</sup> The two-thirds of earned income limit is still in effect, except for single-parent students after 1995.<sup>6</sup>

In 1983, the rules were changed so that the spouse with the lower income would claim the deduction. In addition, if one of the parents was in full-time attendance at a designated educational institution or was otherwise incapable of caring for the children, the higher-income spouse could claim the deduction. Higher-income spouses are subject to additional weekly limits on the amounts deductible, because the deduction is prorated for the portion of the year in which the other spouse is not available to provide care. (In the earlier years of the deduction, these additional limits applied generally to men.) In 1988, the amount available for children under 7 years of age was increased relative to the amount available for children between the ages of 8 and 13. The limit on the maximum

annual deduction per family was also removed. These rules remain in effect. Since 1988, then, no further (or additional) limits have affected to families with more than four children.<sup>7</sup> In 1996, the age limit for older children without disabilities was increased to 16.<sup>8</sup> In 1998, the deduction was extended to part-time students.<sup>9</sup>

Appendix A shows the evolution of the CCED limits between 1972 and 1999, in nominal and constant 1999 dollars.<sup>10</sup> In 1999 dollars, the maximum annual per child deduction for children under 7 years of age increased from \$2,119 in 1972 to \$7,000 in 1999, and for children between 8 and 16 the maximum deduction increased from \$2,119 in 1972 to \$4,000 in 1999. Although the limits can become binding for a significant proportion of families, particularly in inflationary times or when limits have not been adjusted for a number of years, evidence presented in subsequent sections indicates that the limits are not binding for the majority of families.

### **VERTICAL AND HORIZONTAL EQUITY CONCEPTS AND RELATED LITERATURE**

In this section I consider general definitions of vertical and horizontal equity. Vertical equity is achieved when those with a greater ability to pay share a greater proportion of costs. The aim of a progressive taxation system is to achieve vertical equity. Horizontal equity is achieved when those with equal ability to pay share an equal proportion of costs, regardless of other differences such as source of income.

The question arises as to the appropriate measure of “ability to pay.” I consider two possible measures: actual and potential income. Actual income is pre-tax actual income, while potential income is the income that would be earned if the individual worked for pay full-time. Most of the literature discussed below uses either one or both of these definitions to evaluate equity. Conclusions regarding the appropriate treatment of child-care expenses in the tax system are related to whether ability to pay is measured in terms of actual or potential income.

The distinction between actual and potential income is an important one in choice theory. Individuals (or families) are assumed to make rational choices about market consumption, market labour supply, home production, and leisure on the basis of their preferences and their opportunity set. The opportunity set consists of all the possible consumption-labour supply-home production-leisure combinations available to individuals or families given their wage rates and non-labour income that exhaust their resources.<sup>11</sup> Some people prefer more leisure with less market consumption, while others prefer to work more and consume more market goods. Furthermore, in a household with young children, there are considerable opportunities for home production to replace market production and vice versa (mother’s care versus purchased child care, home-cooked meals versus frozen dinners or restaurant meals, etc.). Conceptually, potential income can be seen as the market value of actual consumption plus the market value of actual leisure

and home production. In contrast, actual income captures only the market value of consumption and ignores the market value of leisure and home production. An individual who works the maximum number of hours possible in the marketplace will earn actual income that is equal to her potential income, and thus actual income will reflect her opportunity set. In contrast, an individual who works less than the maximum number of hours will earn actual income that is less than her potential income, and thus actual income will understate the value of her opportunity set. This distinction is crucial to the analysis of equity in societies where families make widely different choices about their degree of market consumption versus leisure and home production. I adopt a somewhat more restricted definition of potential income, which limits potential paid hours of work to the greater of 7.5 hours per day and hours actually worked.

### **The Widower and the Nanny**

The difference between using potential income and actual income as a measure of ability to pay is illustrated in table 1, which employs three scenarios of a basic story to gauge horizontal equity.<sup>12</sup> The story is about a widower who needs child care for his two children. In scenario 1, the widower hires a nanny to care for his children. In scenario 2, the widower and the nanny marry and the nanny stays home to care for the children. In scenario 3, the widower and the nanny marry and the nanny goes to work outside the home, earning the same as before she was married, and hires another nanny to replace all of her own services at the same price. This scenario thus models the dual-earner couple. In all cases the couple's potential income is \$94,000, which is also their actual income in scenarios 1 and 3, when the nanny's services are compensated through a taxed market exchange. In scenario 2, however, when the nanny's services are compensated through untaxed marital transfers of resources, their actual income is \$70,000.

Although the widower and the nanny, when considered as a couple, have the same before-tax opportunity set regardless of their situation,<sup>13</sup> their after-tax position deteriorates significantly when the (married) nanny works outside the home. The unmarried couple in scenario 1 has the best after-tax position.<sup>14</sup> The dual-earner couple in scenario 3 has the worst after-tax position. Relative to couple 1, couple 3 does not have an equivalent-to-married deduction and the lower-income spouse claims the CCED; the result is additional tax of \$1,500 +  $[(0.42 - 0.26) \times \$14,000 = \$3,740$ . Relative to the married couple with a stay-at-home parent in scenario 2, couple 3 must report \$24,000 of additional income. Since only \$14,000 of this income is deductible, the result is additional tax of  $\$10,000 \times 0.26 = \$2,600$ . If the CCED were eliminated, couple 3 would pay \$3,640 ( $\$14,000 \times 0.26$ ) more in tax and couple 1 would pay \$5,880 ( $\$14,000 \times 0.42$ ) more. If the CCED were extended to married couples with a stay-at-home parent, couple 2, with a deduction of \$14,000, would save an additional \$5,880. Either one of these measures (eliminating or extending the CCED) would increase horizontal inequity relative to couple 3.

**Table 1 Widower-Nanny Example**

*Scenarios*

- 1) The widower and the nanny are not married.
- 2) The widower and the nanny are married and the nanny stays home.
- 3) The widower and the nanny are married and the nanny works outside the home and hires another nanny at the same price.

*Assumptions*

- Child-care expense deduction is \$14,000.
- Personal tax credit is \$1,500.
- Married exemption credit is \$1,500.
- Equivalent-to-married exemption credit is \$1,500.
- Tax on first \$30,000 is 26%.
- Tax on balance is 42%.

*Notes*

If the CCED were eliminated, couple 1 would have discretionary income<sup>a</sup> of \$49,540 – 0.42(\$14,000) = \$43,660 and couple 3 would have discretionary income of \$45,800 – 0.26(14,000) = \$42,160. With the CCED, couple 3 still has \$2,600 less in discretionary income than couple 2. Without the CCED, the discrepancy increases to \$6,240.

	(1) Not married			(2) Married	(3) Both work		
	Widower	Nanny	Combined	Combined	Widower	Nanny	Combined
Gross earnings . . . . .	\$70,000	\$24,000	\$94,000	\$70,000	\$70,000	\$24,000	\$94,000
Child-care expense deduction . . . . .	14,000		14,000			14,000	14,000
Taxable earnings . . . . .	\$56,000	\$24,000	\$80,000	\$70,000	\$70,000	\$10,000	\$80,000
Tax on first \$30,000 . . . . .	\$ 7,800	\$ 6,240	\$14,040	\$ 7,800	\$ 7,800	\$ 2,600	\$10,400
Tax on balance . . . . .	10,920		10,920	16,800	16,800		16,800
Taxes before credits . . . . .	\$18,720	\$ 6,240	\$24,960	\$24,600	\$24,600	\$ 2,600	\$27,200
Personal credit . . . . .	\$ 1,500	\$ 1,500	\$ 3,000	\$ 1,500	1,500	1,500	3,000
Married credit . . . . .				1,500			
Equivalent-to-married credit . . . . .	1,500		1,500				
Tax payable . . . . .	\$15,720	\$ 4,740	\$20,460	\$21,600	\$23,100	\$ 1,100	\$24,200
After-tax income . . . . .	\$54,280	\$19,260	\$73,540	\$48,400	\$46,900	\$22,900	\$69,800
Household services cost . . . . .			24,000	<sup>b</sup>			24,000
Discretionary income <sup>a</sup> . . . . .			\$49,540	\$48,400			\$45,800

<sup>a</sup> After-tax income less household services cost (the nanny’s income).

<sup>b</sup> Since household services income is not recognized, household services cost is not deducted.

It is clear that the married nanny would work outside the home only if she could deduct the full cost of her replacement, or if she could earn an income that exceeds the cost of her replacement by an amount sufficient to offset the tax

liability that arises from the inability to deduct that cost. Hence, if a secondary wage earner is to work outside the home, either the value of her market production must be greater than the amount that the family would be willing to pay for child care and other household services, or the value of her market production must be significantly greater than the value of her household production. In this example, when potential income is used to evaluate horizontal equity, income taxes are divided by \$94,000 in scenarios 2 and 3 to measure the tax rate the couple faces in each of the two situations. The benefits of household production are thus recognized in determining the measure of ability to pay. The tax rates are 23.0 percent for the couple with a stay-at-home parent and 25.7 percent for the couple with two parents who engage in market work.<sup>15</sup>

### Potential Income Measures in the Literature

A number of authors either implicitly or explicitly use potential income as the appropriate measure of ability to pay. Gentry and Hagy examine horizontal and vertical equity concepts in relation to the tax treatment of child-care expenses in the United States.<sup>16</sup> They point out that the Haig-Simons definition of income<sup>17</sup> supports the *deductibility* of child-care expenses in families where these expenses are incurred to earn income<sup>18</sup> (as opposed to treating child-care expenses as a tax credit). The central point of their analysis is that since actual income of the family is dependent on labour supply choices, actual income is not necessarily the appropriate measure of ability to pay. Using a sample of families with children<sup>19</sup> and a measure of actual income, Gentry and Hagy find that the US child-care tax credit is regressive in the lowest quintile of the income distribution and progressive for the higher quintiles. When potential income<sup>20</sup> is used as the measure of ability to pay, the benefits are progressive throughout the income distribution. Gentry and Hagy evaluate horizontal equity by examining the distribution of benefits across family characteristics, but they fail to analyze this issue across families with and without a stay-at-home parent.

Feldstein and Feenberg also implicitly favour a potential income measure in their analysis of the taxation of dual-earner families.<sup>21</sup> They argue that the US system of taxing families instead of individuals is unfair because it imposes the same burden of taxation on a married couple with one earner as it does on a dual-earner couple with the same income. The unfairness arises because the dual-earner couple usually works more hours in the marketplace and has less untaxed home services.<sup>22</sup> In the Canadian tax system, this inequity is somewhat mitigated by individual filing combined with a progressive taxation system.

Similarly, when Krashinsky and Cleveland examine the issue of tax fairness for single- and dual-earner families, the idea that single-earner households (with two parents) benefit from untaxed household production is central to their analysis.<sup>23</sup> They examine the role of the CCED in taxation and also conclude that it *partially* corrects for the non-taxation of household production and thus contributes to the reduction of horizontal inequity between single- and dual-earner households.

Vincent and Woolley look at the other side of this question. They note that the CCED is needed to achieve horizontal equity since it merely recognizes the costs of working or, alternatively, recognizes that (the benefit of) parent-provided child care is untaxed. They conclude that child-care costs incurred to earn income should also be untaxed.<sup>24</sup>

### Actual Income Measures in the Literature

The strand of the literature that implicitly or explicitly focuses on actual income as the appropriate measure of ability to pay reaches opposite conclusions with respect to horizontal equity. In addition, when the underlying economic rationale for the CCED—the promotion of horizontal equity—is ignored, issues of vertical equity are often brought to the fore.

Boessenkool examines the Canadian tax treatment of the family. He argues that the CCED contributes to horizontal inequity because the choice of parents who do not raise their children at home is “subsidized,” while the choice of parents who do is not.<sup>25</sup> In an earlier analysis, Boessenkool and Davies state:

Critics of the CCED ignore the fact that parents who provide child care themselves, instead of purchasing it in the market, in effect *already enjoy a child care deduction*. The value of their child care services, which is a form of in-kind income, is not taxed. Allowing for a deduction [the CCED for dual-earner families] when these are paid out of earned income is thus a simple requirement of horizontal equity.<sup>26</sup> [Emphasis added.]

This statement contradicts Boessenkool’s later claim that the CCED violates horizontal equity. The interpretations differ because in one case horizontal equity is evaluated on the basis of actual income, while in the other the value of household production is also recognized.

Gordon examines the adequacy of section 63 of the federal Income Tax Act<sup>27</sup> (the CCED) as the principal mechanism for state funding of child care.<sup>28</sup> In her analysis, Gordon points to the Hogg and Magee argument that

[t]he failure to tax imputed income is one factor tending to discourage women from seeking work outside the home. . . . [T]he partial deductibility of child-care expenses helps reduce the barrier against work outside the home.<sup>29</sup>

Gordon dismisses this fundamental point, however, by stating that many families are denied the option of staying at home (by tax policy, for example) and that others may simply be unemployed.<sup>30</sup> Gordon argues that a program of grants and subsidies to approved child-care facilities would be preferable to the CCED. She also suggests that the implicit child-care costs of stay-at-home parents should be subsidized.<sup>31</sup>

Hung argues that the CCED encourages employment in the outside labour force by limiting the deduction to actively earned income and that it discourages the recognition of the domestic labour force.<sup>32</sup> She argues that the CCED violates

horizontal equity by not providing the same tax benefits and assistance to those in the same economic position.

Young examines the *Symes v. Canada* case<sup>33</sup> in terms of its vertical equity implications.<sup>34</sup> Symes, a self-employed professional, argued that any child-care expenses that are not deductible under section 63 should be deductible as business expenses. The Supreme Court of Canada disagreed and ruled that child-care expenses are not deductible as business expenses. Young concludes that although a positive result for Symes might have improved the situation for women, already privileged women would have benefited most, and that since the pool of child-care funding is limited, already disadvantaged women would have been worse off. In effect, a positive *Symes* result would have reduced vertical equity.

The arguments common in papers that focus on actual income as the appropriate measure of ability to pay are that the CCED, or any form of state funding to child care for working parents, violates horizontal equity between two-parent single- and dual-earner families with identical *actual* income, and/or that the CCED violates vertical equity. Untaxed household production or costs of working are given little or no consideration. In this study, both concepts of ability to pay are used to evaluate equity and to demonstrate how these different concepts can lead to markedly different conclusions.

An additional concern that arises in measuring ability to pay is whether annual measures of income are more appropriate than life-cycle income measures. Altshuler and Schwartz use these two different measures to evaluate the progressivity of the US treatment of child-care expenses and find the system to be progressive.<sup>35</sup> When all families are included in the evaluation of a child-care-expense-related deduction or credit, the benefit may appear more progressive because individuals eligible for the deduction or credit are in young families who tend to earn less than individuals in older families. Young families eventually become old families and it is thus not appropriate to treat them as “different” families or families with different ability to pay. Using the life-cycle approach to defining income compensates for this. Gentry and Hagy<sup>36</sup> avoid this issue by restricting their analysis to families with young children. That approach is followed here.

### **CCED CEILINGS AND CHILD-CARE PAYMENTS BY INCOME GROUPS, 1987-1988**

In this section I look at how claimants were affected by the increase in eligible child-care expenditures for children under 7 years of age from \$2,000 in 1987 to \$4,000 in 1988. I also look at the proportion of income that claimants in different income groups spend on child care.

Figure 1 shows the percentage of taxable claimants affected by the family limit, by income group, for 1987 and 1988.<sup>37</sup> Higher-income claimants are more likely to be affected by the limit on expenditures that can be claimed, because they tend to spend more on child care.<sup>38</sup> Hence, although higher-income claimants may receive a higher tax rebate on the last dollar they spend on child care, this

occurs only if their expenditure is below the limit. Once the limit is reached, there is no additional tax deduction. Because the limits are more likely to affect higher-income individuals, they increase the vertical equity of the CCED. The years 1987 and 1988 are included to show the effect of a decrease in the limit on the distribution by income group of individuals who are affected by the limit. As can be seen from the change in the percentage of claimants affected by the limit when it is lifted, individuals in the upper-middle income groups are the ones most likely to benefit from the change.

Figure 2 shows reported child-care expenses as a percentage of claimants' income, by income group, for all taxpayers with CCED claims in 1987 and 1988.<sup>39</sup> To calculate the percentages, the denominator is set to equal the midpoint of the income cell, except for the highest income group, where \$100,000 is used to represent income. As income rises, child-care expenses decline as a proportion of income.

Although these statistics provide insight into vertical equity, horizontal equity has to be analyzed using data and procedures that take the heterogeneity of taxpayer choices into account. These are discussed in the following sections.

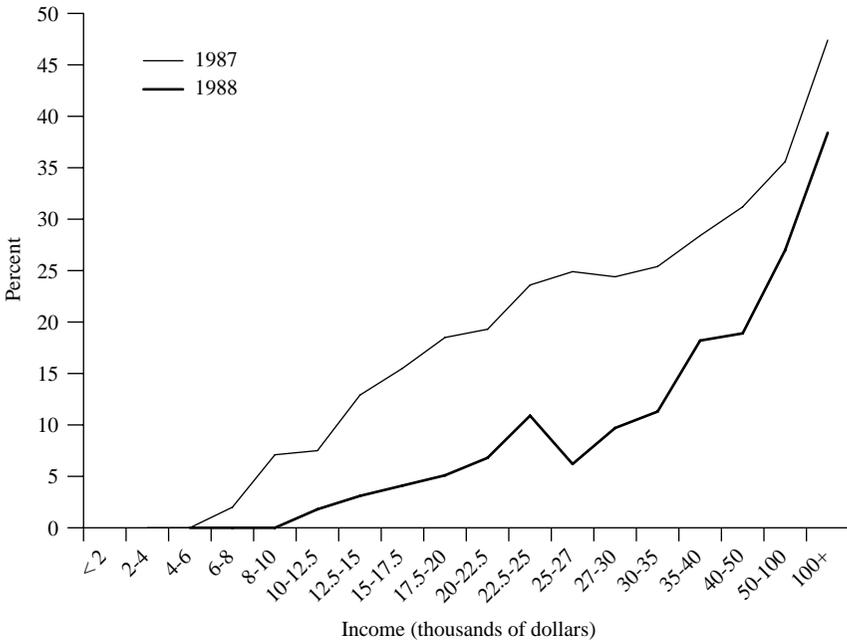
#### **DATA AND ESTIMATION PROCEDURE**

The 1988 Canadian National Child Care Survey (CNCCS) provides data on family characteristics and child-care expenditures for a sample of 24,155 families with children under 13 years of age. A total of 42,131 children are represented in the survey. Data include the different types of supplementary care used for each of four children in the family in the reference week, the individual cost by care arrangement and child, the total cost of care for the family, and whether the parents planned on claiming individual costs on their tax return.

I estimate an annual cost of care and related CCED benefit for each family with child-care costs. To do this, I first estimate an hourly cost of care equation for families who plan to claim the primary cost of care for their youngest child.<sup>40</sup> Hourly cost of care for non-claimants is lower than hourly cost of care for claimants. Non-claimants usually do not claim their child-care expenses because the care provider does not supply receipts. I assume that in a competitive child-care market<sup>41</sup> the child-care purchaser will require either receipts from the provider or a lower fee as compensation for the loss of the CCED benefit.<sup>42</sup> I predict a "full cost" of care for each family with child-care expenses and estimate the CCED benefit on the basis of this full cost for each family. The full cost is the predicted cost of care using coefficient estimates for claimed care. The annual predicted cost equals the weekly cost times 52 for families who claim the primary care cost for their youngest child. For other families with child-care costs, the predicted cost of care equals the predicted hourly cost of claimed care for this type of family times the designated adult's usual weekly hours of work times 52.

I estimate predicted annual earnings for the designated adult and the spouse. In order to do this, I estimate a selection-corrected wage equation using the 1988 Labour Market Activity Survey, and use the coefficients from this equation (reported

**Figure 1 Percentage of Taxable Claimants Affected by Family Living, by Income Group, 1987 and 1988**



in appendix C) with parallel characteristics in the CNCCS to estimate wage rates for the CNCCS designated adults and spouses. The wage rates are multiplied by usual hours of work to arrive at predicted annual earnings. To estimate full-time annual earnings, the predicted wage rates are multiplied by 1,950 hours (37.5 hours per week). Potential earnings are the greater of actual and full-time earnings.

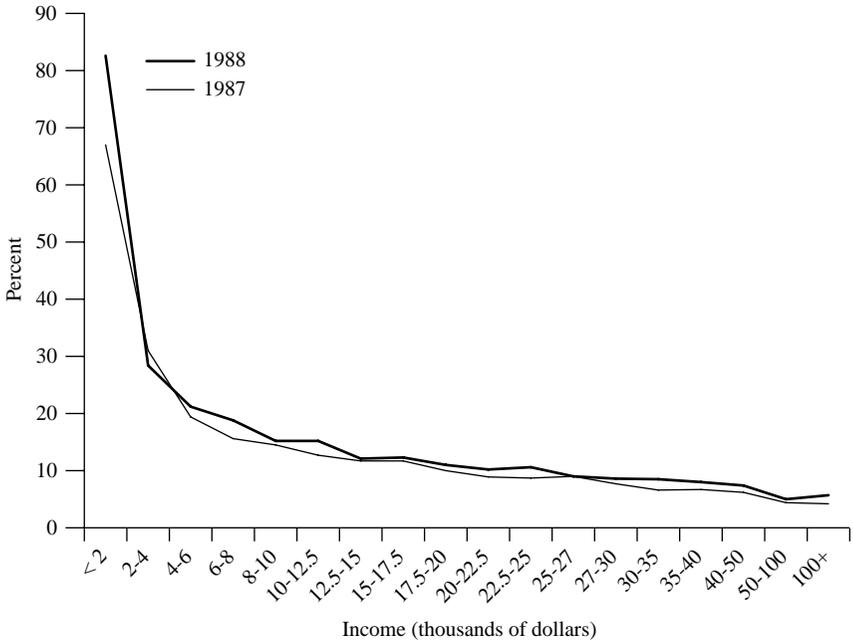
For example, using the coefficients from appendix C, the 1988 predicted log-wage rate for a Canadian-born 30-year-old married woman who has a university degree, lives in Ontario (the reference group), and has one child under the age of 16 is:<sup>43</sup>

$$\begin{aligned} \ln W &= 1.834 + 0.208 + 0.699 - 0.018 \\ &= 2.723. \end{aligned}$$

This yields a wage of \$15.23 and, assuming a 37.5-hour workweek, full-time annual earnings of \$29,690. For 1999, all earnings and child-care costs estimates are multiplied by 1.303, which is based on changes in the overall Canadian consumer price index (CPI) from 1988 to 1999. Hence, the 1999 full-time earnings for the same woman are predicted as \$38,687.

I estimate the 1988 and 1999 tax expense with and without the CCED for each (potential) claimant and for the family as a whole. Tax calculations are based on

**Figure 2 Child-Care Payments as a Percentage of Income, by Income Group, 1987 and 1988**



province of residence and include federal surtaxes, family allowances in 1988,<sup>44</sup> the federal child tax credit, the federal sales tax credit, and provincial surtaxes and credits, but do not include provincial child benefit payments.<sup>45</sup> Canada Pension Plan and employment insurance payments are also not included in the calculation: it is assumed that the net costs of these equal their net benefits. Although Quebec allowed the CCED to be deducted by the higher-income earner in 1988 and had converted the deduction to a refundable credit by 1999, for the purposes of comparison benefits for families living in Quebec are simulated as though Quebec used the same rules as the rest of Canada.

**ANALYSIS**

**Horizontal Equity**

Horizontal equity is evaluated by comparing the tax rates faced by two-parent families with children under 6 years of age.<sup>46</sup> The analysis in this section is limited to two-parent families because single-parent families are likely to collect social assistance when the parent is not employed, and are also likely to receive child-care benefits when the parent is employed. Families are sorted into two groups: single-earner (at least one parent does not usually work) and dual-earner (both parents work).

Figures 3 and 4 show 1988 and 1999 average family tax rates as a proportion of predicted actual family earnings for two-parent families with children under the age of 6. At income levels of \$30,000 or more in 1988, and \$40,000 or more in 1999, single-earner families with a stay-at-home parent face higher tax rates than dual-earner families, regardless of the CCED. The higher tax rates for families with a stay-at-home parent are due to individual progressive taxation; the CCED only exacerbates the discrepancy, which adds fuel to the argument that it violates horizontal equity.

Figures 5 and 6 show 1988 and 1999 average family tax rates as a proportion of potential family earnings for two-parent families with children under the age of 6. In both years at all earnings levels, single-earner families with a stay-at-home parent face a much lower tax rate than dual-earner families. The CCED reduces the horizontal inequity that results from untaxed household production, although most of the inequity remains.<sup>47</sup> Note that 1999 tax rates tend to be lower than 1988 rates. The child tax credit is treated as a negative tax in both years. This benefit is much larger in 1999 because it replaced family allowances of earlier years.<sup>48</sup>

It is clear that when people work more they earn more taxable income, so the fact that families who work more hours are more likely to have a higher tax rate in a progressive income tax system is not an unusual discovery. However, household production and leisure are given up to earn additional market income, and these provide tangible untaxed benefits to those who choose to enjoy them rather than increase their labour supply. Using potential income as a measure of ability to pay recognizes the value of household production and leisure.

### Vertical Equity

Since the main purpose of the CCED is to rectify horizontal inequity,<sup>49</sup> I focus my analysis of vertical equity on potential claimants—that is, on parents who work and incur child-care costs.

There are five effects at work in terms of vertical equity of the CCED. These can be examined with the following simplified equation for CCED benefits as a proportion of income:<sup>50</sup>

$$\text{Percent CCED benefit} = \frac{\text{CCED benefits}}{\text{Income}}$$

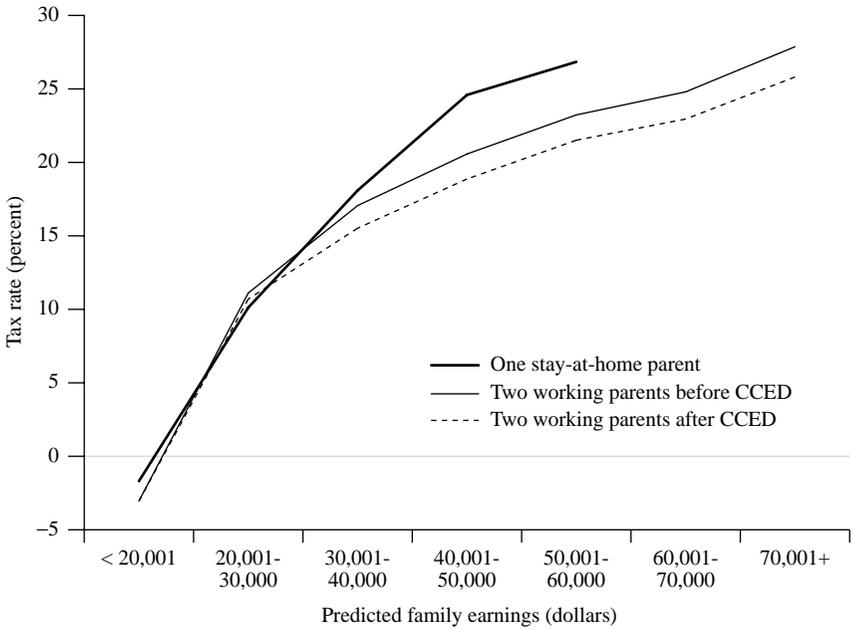
$$= \begin{cases} \frac{CC * MTR}{\text{Income}} & \text{if } CC \leq \text{limit, and} \\ \frac{\text{Limit} * MTR}{\text{Income}} & \text{if } CC > \text{limit} \end{cases}$$

where

*CC* = child-care expenses, and

*MTR* = marginal tax rate.

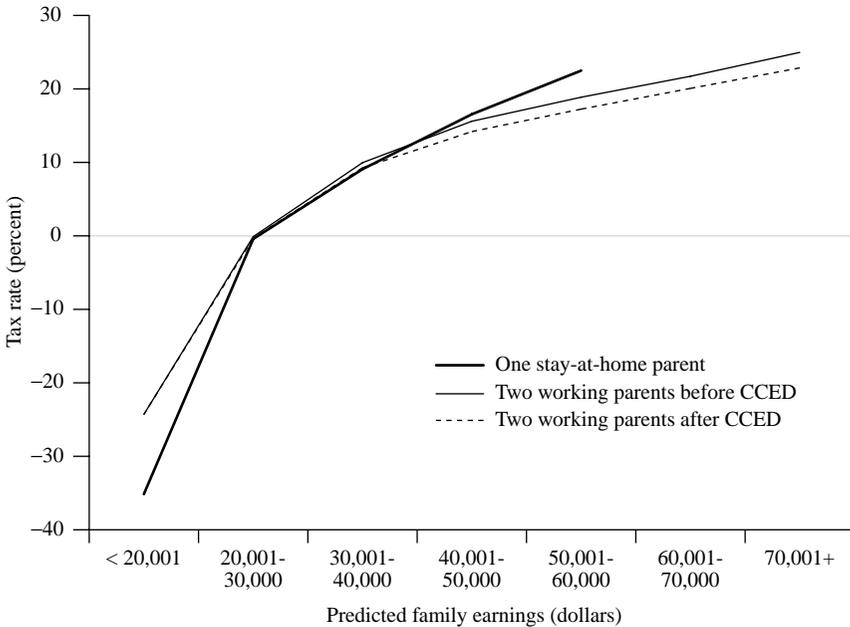
**Figure 3 1988 Average Family Tax Rates as a Proportion of Predicted Family Earnings: Two-Parent Families with Children Under 6**



The five effects are as follows:

- 1) As income rises, child-care expenses per child also rise, but not as fast as income. The ratio of benefits to income declines as income rises because child-care expenses decline as a proportion of income. This effect works in favour of vertical equity.
- 2) As income rises, the annual deduction limit is approached and, eventually, exceeded. Above the limit, there are no tax benefits to additional expenditures on child care. Thus the ratio declines as income rises. This effect works in favour of vertical equity.
- 3) As income rises, the marginal tax rate rises, which causes the ratio to rise. This effect works against vertical equity.
- 4) When income is very low, the two-thirds of earned income limit is more likely to bind, and low-income taxpayers will receive little or no benefit. This effect works against vertical equity.
- 5) When income is very low, or when a lower-income taxpayer has a lot of personal tax credits, the benefit from the CCED cannot be enjoyed because there is little or no tax liability and the benefit is not refundable. This effect works against vertical equity.

**Figure 4 1999 Average Family Tax Rates as a Proportion of Predicted Family Earnings: Two-Parent Families with Children Under 6**



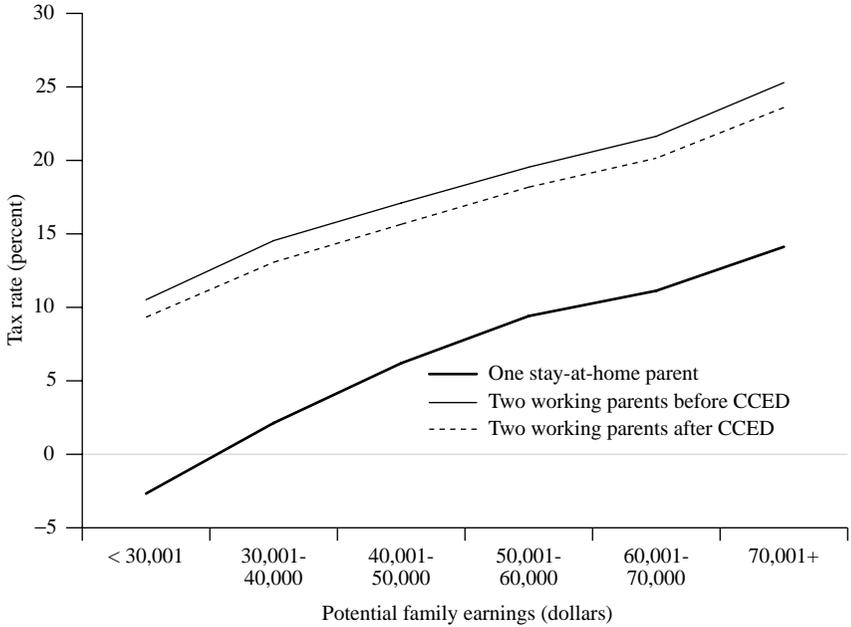
Much of the debate about the vertical equity of the CCED focuses on the absolute amount of benefits received by claimants based on their income. Figures 7 and 8 show the 1988 and 1999 nominal-dollar potential CCED benefits when claimants' expenditures on child care are equal to or greater than the CCED ceiling.<sup>51</sup> The calculations are based on British Columbia tax rates. Figure 7 shows benefits for single-parent families; figure 8 shows benefits for two-parent families. It is clear that potential benefits from the CCED increase with income. There are no benefits for low income earners, and potential benefits jump with increases in marginal tax rates.<sup>52</sup>

A single parent begins to enjoy the benefit only when she reaches an income level that is almost twice that of the married parent. This occurs because the single parent is entitled to an equivalent-to-married deduction and pays no tax until her income exceeds that of the married parent.

Most of the arguments against the CCED point to this apparent regressivity as proof that the deduction violates vertical equity. Low-income individuals do not benefit from the CCED, the amount of the benefit increases with income, and the benefit limit is reached only when income exceeds \$60,000.

The regressivity of a tax measure is evaluated, however, by the impact of the measure on tax rates as income rises. Hence, it is the benefit *rate* rather than the

**Figure 5 1988 Average Family Tax Rates as a Proportion of Potential Family Earnings: Two-Parent Families with Children Under 6**

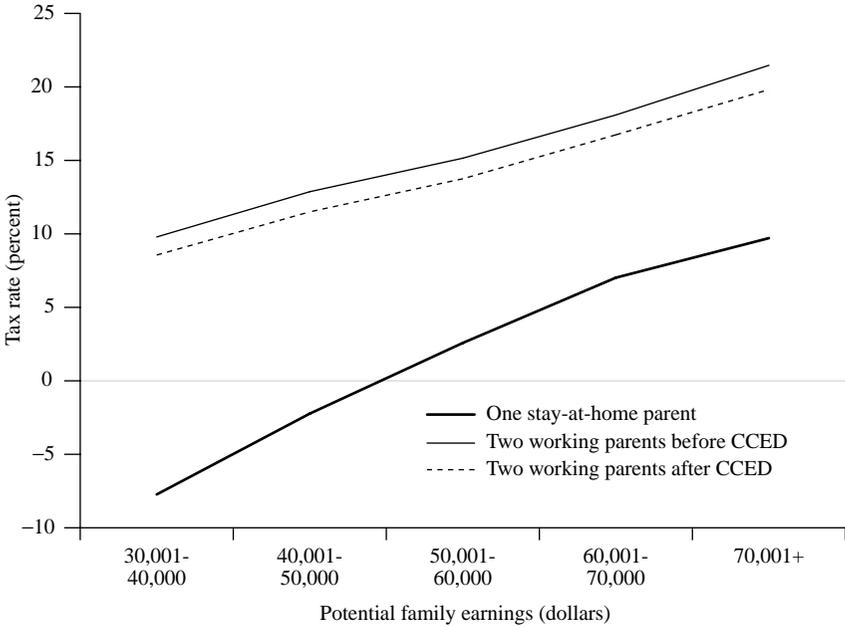


absolute benefit that should be considered. This is consistent with the definition of vertical equity, which states that those with higher incomes should pay a greater *proportion* of their income in taxes.

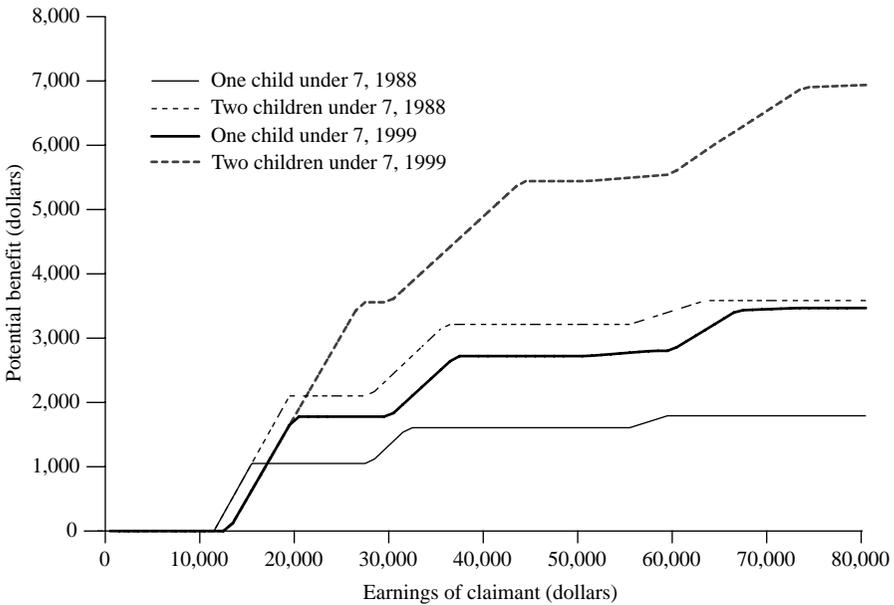
Figure 9 shows the 1988 and 1999 nominal-dollar potential CCED benefits as a percentage of earnings of single- and two-parent families with two children under 7 years of age. The benefit is very regressive at lower income levels, becomes progressive for low-middle income levels, is regressive again when the second marginal tax rate is reached, and becomes progressive again for the balance of higher income levels. It should be remembered, however, that low income earners in single-parent families can usually qualify for full or partial child-care subsidies and thus may not face any child-care costs. Nevertheless, these subsidies are often subject to ceilings and availability constraints, and the CCED would not likely provide any additional relief for the remainder of these costs for a low-income single parent. However, child-care subsidies are specifically intended to address vertical equity concerns, and if the subsidies are inadequate the CCED itself should not be maligned.

At this point, it might be useful to consider an example of how the definition of actual versus potential income might affect vertical equity. The tax calculation in table 2 is similar to that in table 1. Here, the three situations are as follows:

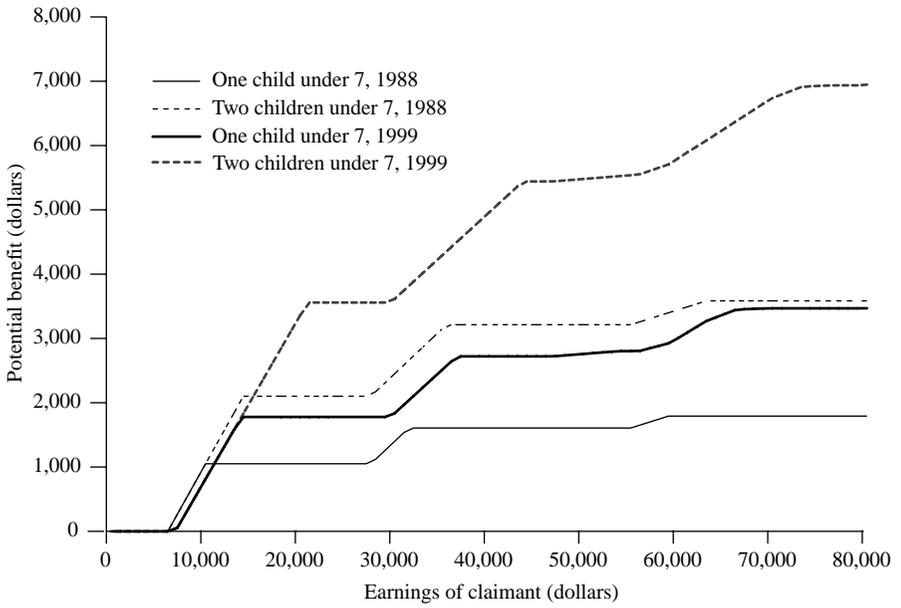
**Figure 6 1999 Average Family Tax Rates as a Potential of Predicted Family Earnings: Two-Parent Families with Children Under 6**



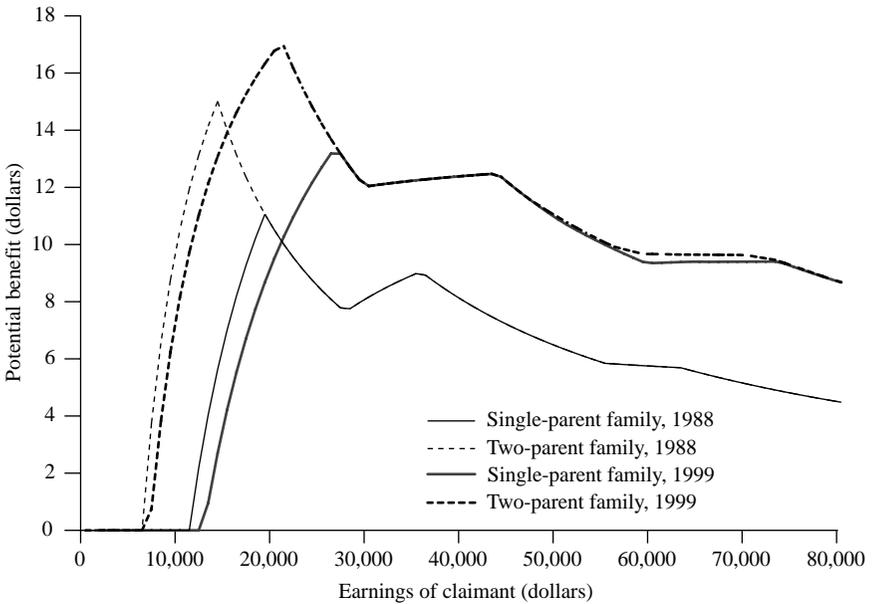
**Figure 7 Potential CCED Benefits: Single-Parent Families, 1988 and 1999**



**Figure 8 Potential CCED Benefits: Two-Parent Families, 1988 and 1999**



**Figure 9 Potential CCED Benefits as a Percentage of Earnings: Two Children Under 7, 1988 and 1999**



- 1) both the husband and the wife work, together earning actual and potential income of \$70,000, and they are entitled to a CCED of \$14,000, which covers all of their child-care costs;
- 2) both the husband and the wife work, together earning actual and potential income of \$70,000, but the CCED does not exist; and
- 3) the husband works, earning actual income of \$70,000, and the wife stays at home, but could earn \$40,000 if she worked full-time, so the couple's potential income is \$110,000.

Tax is calculated for all three situations, and at the bottom of the table tax liability is expressed as a percentage of pre-tax actual, discretionary, and potential income. When tax is expressed as a percentage of actual income, the system appears to suffer from horizontal inequity because couple 3 has a much higher rate of taxation than couples 1 and 2, even though they all have the same actual income. The CCED only exacerbates this problem. When tax is expressed as a percentage of discretionary income, which is defined as pre-tax actual income less child-care expenses, the system no longer violates horizontal equity and is progressive because the couple with the higher discretionary income (3) faces a higher tax rate. The CCED increases the progressivity of the system. When tax is expressed as a percentage of potential income, the tax system is regressive without the CCED, and moderately progressive with it.

Note that when income is spread over two taxpayers, as in cases 1 and 2, compared with one taxpayer, as in case 3, individual filing and a progressive tax rate structure tend to promote vertical equity when ability to pay is measured in terms of potential income. These features compensate to some degree for untaxed household production. The same features appear to violate horizontal equity when ability to pay is measured in terms of actual income.

Figures 10 to 13 show predicted CCED benefits as a proportion of actual and potential family income for two-parent dual-earner families with one child under the age of 7 and child-care costs for 1988 and 1999. Figures 10 and 11 show the predicted CCED benefits as a proportion of predicted and potential family earnings<sup>53</sup> for 1988; figures 12 and 13 show the same data categories for 1999. The data are plotted for families with one child under 7 to limit the comparison to similar families with different incomes,<sup>54</sup> and because the ceiling on the deduction changes at age 7.

It should be noted first that the CCED benefit as a proportion of predicted family earnings is quite low, ranging from 0 to 5 percent in 1988 to up to 6 percent in 1999. Many of the observations show zero benefits at lower earnings levels. Since the observations are restricted to dual-earner families with child-care costs, families with no benefits are those where the income of the lower-income spouse is so low that there is no tax liability, even without the CCED. As the income measure is changed from predicted to potential family earnings, the bottom of the distribution moves to the right. This occurs because families with very low or zero benefits are more likely to have a parent who is not working full-time, and hence

**Table 2 Actual Versus Potential Income**

*Scenarios*

- 1) Both the husband and the wife work full-time and together earn \$70,000. They incur child-care costs of \$14,000 per year. These costs are fully deductible.
- 2) Both the husband and the wife work full-time and together earn \$70,000. They incur child-care costs of \$14,000 per year. These costs are not deductible.
- 3) The husband works full-time and earns \$70,000. The wife does not work but could earn \$40,000 if she worked full-time.

*Assumptions*

- Personal tax credit is \$1,500.
- Married exemption credit is \$1,500.
- Tax on first \$30,000 is 26%.
- Tax on balance is 42%.

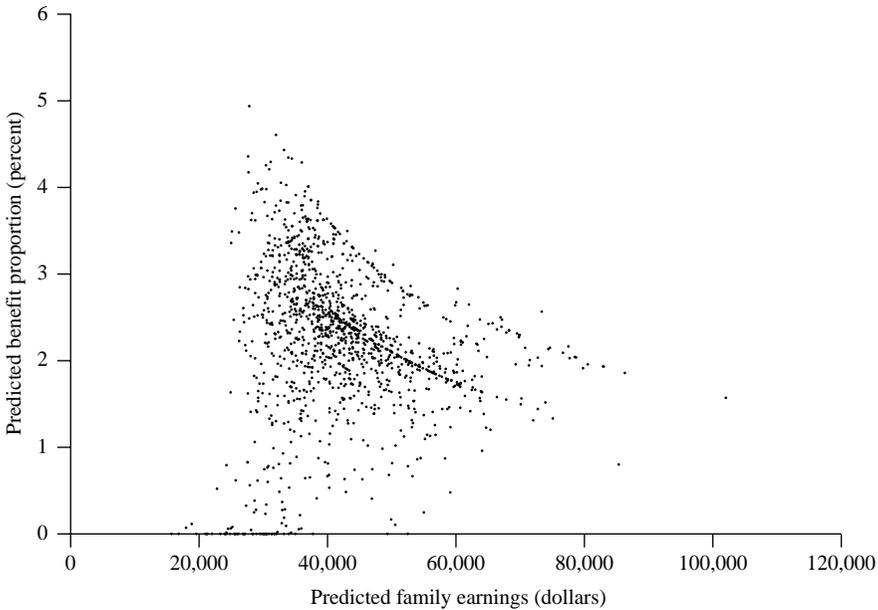
*Notes*

If actual income is the measure of ability to pay, there appears to be a problem with horizontal equity. If potential income is the appropriate measure of ability to pay, vertical equity is violated when no CCED is allowed, because unequals are treated as equals. The progressivity of the tax system and individual filing mitigate this problem.

	(1) With CCED			(2) Without CCED			(3) One
	Husband	Wife	Combined	Husband	Wife	Combined	Worker
Gross earnings . . . .	\$35,000	\$35,000	\$70,000	\$35,000	\$35,000	\$70,000	\$ 70,000
Child-care expense deduction . . . . .		14,000	14,000				
Taxable earnings . . .	\$35,000	\$21,000	\$56,000	\$35,000	\$35,000	\$70,000	\$ 70,000
Tax on first \$30,000 . . . . .	7,800	5,460	13,260	7,800	9,100	16,900	7,800
Tax on balance . . . .	2,100		2,100	2,100		2,100	16,800
Taxes before credits	\$ 9,900	\$ 5,460	\$15,360	\$ 9,900	\$ 9,100	\$19,000	\$ 24,600
Personal credit . . . .	1,500	1,500	3,000	1,500	1,500	3,000	1,500
Married credit . . . .							1,500
Tax payable . . . . .	\$ 8,400	\$ 3,960	\$12,360	\$ 8,400	\$ 7,600	\$16,000	\$ 21,600
After-tax income . . .	\$26,600	\$31,040	\$57,640	\$26,600	\$27,400	\$54,000	\$ 48,400
Pre-tax discretionary income <sup>a</sup> . . . . .			\$56,000			\$56,000	\$ 70,000
Potential income . . .			\$70,000			\$70,000	\$110,000
Tax payable/actual income . . . .			0.18			0.23	0.31
Tax payable/discretionary income . . . . .			0.22			0.29	0.31
Tax payable/potential income . . . . .			0.18			0.23	0.20

<sup>a</sup> Pre-tax actual income less child-care expenses.

**Figure 10 Predicted Benefit as a Proportion of Predicted Family Earnings:  
Two-Parent Families with One Child Under 7, Dual-Earner Families  
with Child-Care Costs, 1988**

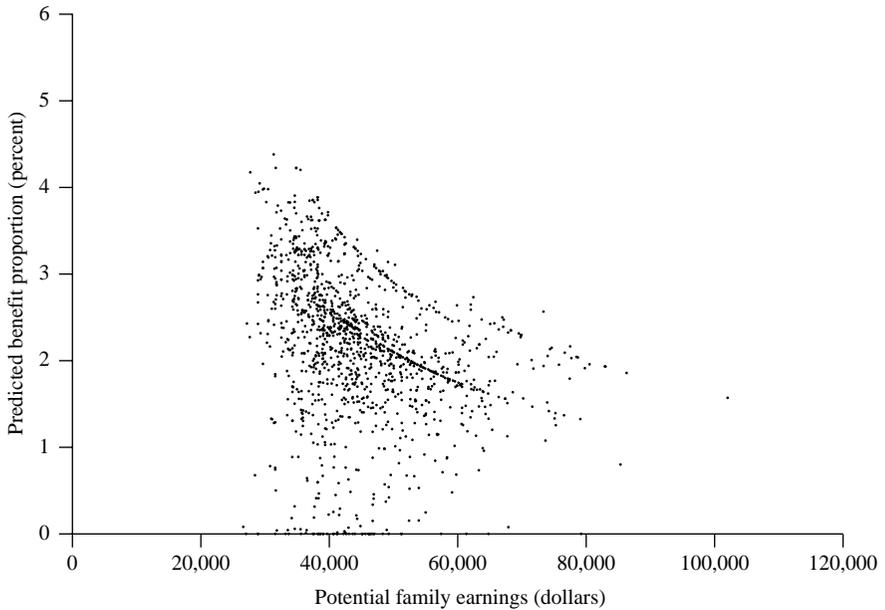


potential income tends to be higher than predicted income for the majority of these families. With zero-benefit observations less concentrated at the bottom of the income distribution, we would expect the vertical equity of the CCED to improve when ability to pay is measured in terms of potential rather than actual income.

It is difficult to assess the degree of vertical equity from figures 10 to 13. Figures 14 and 15 assist in this evaluation by showing the predicted CCED benefit as a percentage of earnings for deciles of predicted claimant earnings, predicted family earnings, and potential family earnings. A downward-sloping benefit curve is an indication of progressivity or vertical equity in the system, while an upward-sloping benefit curve is an indication of regressivity or vertical inequity. When predicted claimant earnings are used in the denominator, the 1988 benefit curve first slopes upward, indicating regressivity at lower earnings levels, and then slopes downward, indicating progressivity. When predicted family earnings are used in the denominator in 1988, a similar but less sharp pattern emerges, although the curve slopes upward again at higher earnings levels. When potential family earnings are used in the denominator, the 1988 benefit curve consistently slopes downward, indicating consistent but very moderate progressivity.

The results for 1999 are similar to those for 1988, although all three benefit slopes turn upward at the eighth decile. While in 1988 federal surtaxes were levied on all income earners, in 1999 federal surtaxes were limited to high income earners.

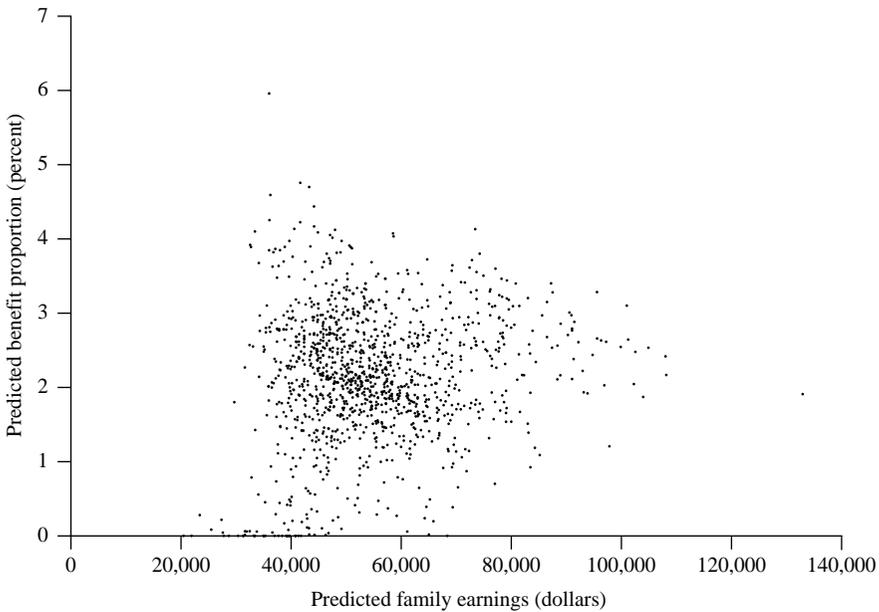
**Figure 11 Predicted Benefit as a Proportion of Potential Family Earnings:  
Two-Parent Families with One Child Under 7, Dual-Earner Families  
with Child-Care Costs, 1988**



Thus, an increase in the progressivity of the overall tax system has resulted in a decrease in the progressivity of the CCED. Another contributing factor could be the increase in the CCED ceiling, which primarily benefits higher income earners because they tend to spend more on child care. Finally, since the CCED reduces net income, this increase in the CCED ceiling may also result in an increase in the child tax credit when incomes are not too high. Note that the simulations for 1999 incorporate no behavioural responses in terms of child-care expenditures that might have occurred as a result of changes in the tax system, changes to the CCED, or changes in relative prices. The new tax structure is merely applied to CPI adjusted earnings and child-care costs. These costs are therefore assumed to maintain the same relationship to earnings that they had in 1988.

The Kakwani<sup>55</sup> index of progressivity is included in the legends for each of the benefit curves in figures 14 and 15. This index can vary from  $-1$  to  $1$ . A negative value for this index is an indication of a regressive system; an increase in the index indicates an increase in progressivity. Both a weighted and an unweighted index are calculated,<sup>56</sup> with the weighted index shown to the left. Note that the index confirms that the progressivity of the CCED declined from 1988 to 1999. When the analysis is restricted to working families who use paid child care, the 1999 index indicates that the CCED is now a neutral benefit in terms of vertical equity, while it was a slightly progressive benefit in 1988. The unweighted index

**Figure 12 Predicted Benefit as a Proportion of Predicted Family Earnings:  
Two-Parent Families with One Child Under 7, Dual-Earner Families  
with Child-Care Costs, 1999**



also indicates that progressivity increases when ability to pay is measured in terms of potential rather than actual income.

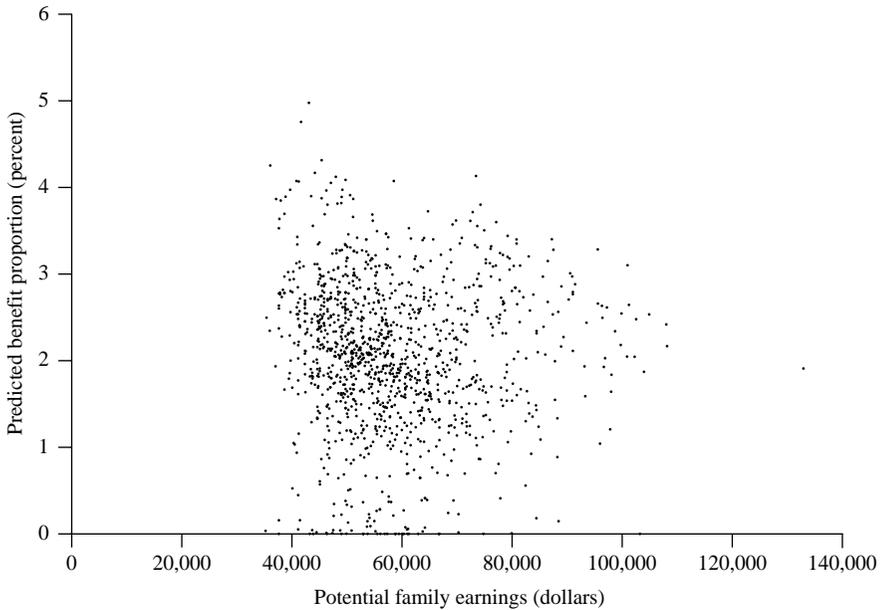
### **Equity Within Households and Women's Equality**

The foregoing analysis addresses the issue of vertical equity across households, but it does not address the issue of equity within households. Fuchs<sup>57</sup> argues that women still are not faring very well in terms of economic equality because they take relatively greater interest than men in the welfare of children. He uses bargaining theory to back up the claim that programs targeted toward the welfare of children will also increase the welfare of mothers. Phipps and Burton<sup>58</sup> reach the same conclusions. The CCED facilitates the use of paid child care, which is likely to benefit children if the only reason parents do not use child care is that the secondary earner cannot afford it. The CCED is designed to take into consideration an expense that arises from the decision of the secondary earner to work for pay. In the absence of fully state-funded child care for working parents, the CCED results in higher after-tax earnings in the pockets of the low-income parent in a family.

### **Historical Context**

In the last four decades the increase in labour force participation by women, and in particular by married women, has been phenomenal. The overall labour force

**Figure 13 Predicted Benefit as a Proportion of Potential Family Earnings:  
Two-Parent Families with One Child Under 7, Dual-Earner Families  
with Child-Care Costs, 1999**



participation rate for women in Canada rose from 24 percent in 1951 to 58 percent in 1994, while the rate for married women rose from 10 to 62 percent.<sup>59</sup> In 1988, 75.3 percent of women between the ages of 25 and 44 were in the labour force;<sup>60</sup> by 1999, 80 percent of married women in the same age group were in the labour force.<sup>61</sup> As a result, the proportion of preschool children both of whose parents work has been increasing. In 1996, both parents of 56 percent of preschool children worked, compared with 38 percent in 1981 and 52 percent in 1991.<sup>62</sup> The issue of child care is important for such families, and the popularity of the CCED has soared over the last three decades as a result.

Figure 16 shows the number of CCED claimants from 1972 to 1996.<sup>63</sup> The number of taxable returns<sup>64</sup> increased fivefold over the 15-year period, from 142,454 in 1972 to 759,540 in 1996.

Figure 17 shows the amount of child-care expenses reported and allowed by taxable and all claimants for the years 1972-1996, in 1999 dollars.<sup>65</sup> As the number of claimants has increased, so has the amount of claims. Taxable and allowable claims increased eightfold, from \$268 million in 1972 to \$2.129 billion in 1996. As a result of the increase in real limits of claims, the increase in the value of allowable claims has been greater than the increase in the number of claims.

**Figure 14 Predicted CCED Benefit as a Percentage of Earnings, by Earnings Deciles: Two-Parent Families with One Child Under 7, Dual-Earner Families with Child-Care Costs, 1988**

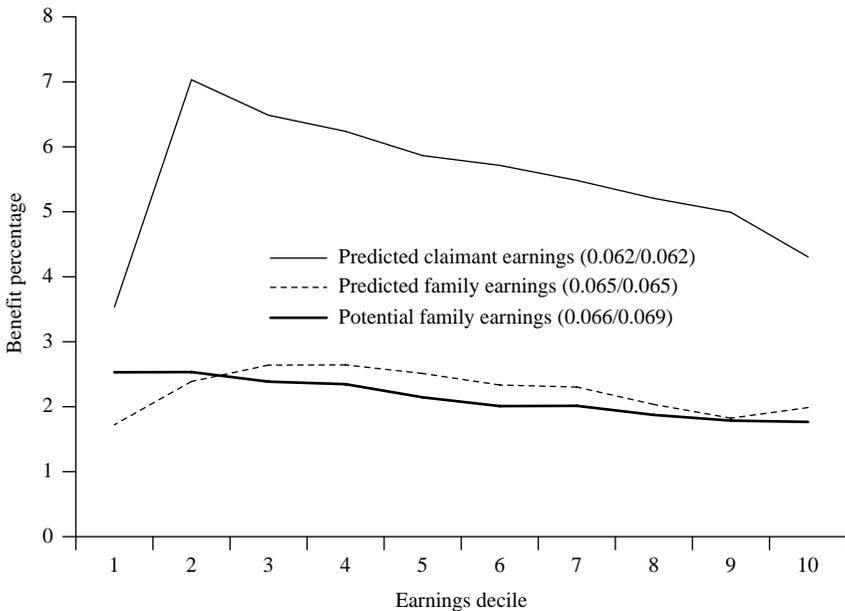
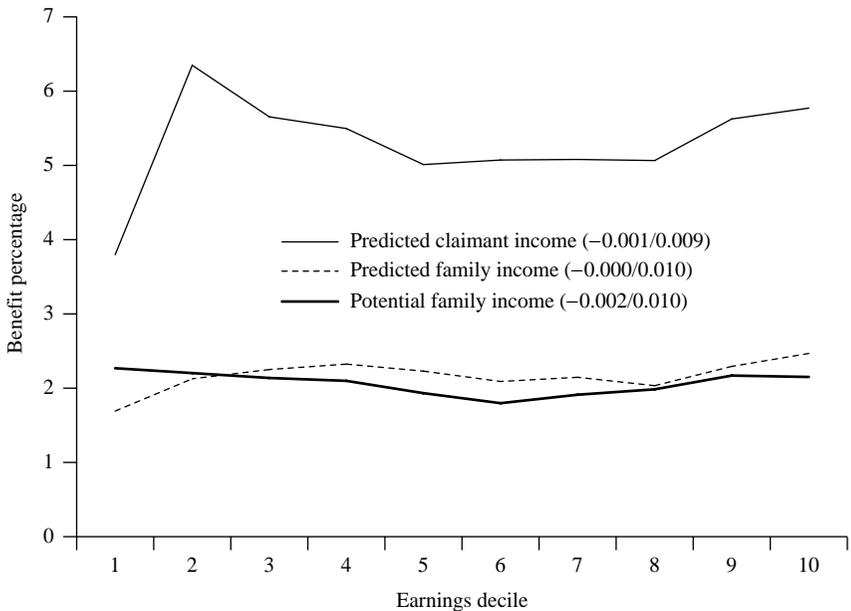


Figure 18 shows the proportion of CCED claimants who were affected by limits from 1972 to 1996. Limits include the two-thirds of earned income limit, weekly limits on men in the early years of the deduction and on the higher-income supporting person in later years, and the family limit based on an amount per child. Taxable claimants affected by the latter limit account for about 94.0 percent of constrained claimants, compared with 91.6 percent for all claimants.<sup>66</sup> The proportion of claimants affected by limits has decreased over the 15-year period as real limits on the maximum allowable deduction for families have increased.

From 1972 to 1996, each time the family limits were increased, the percentage of claimants affected by limitations declined. The 1983 increase in the limit restored the proportion of constrained claimants to its 1976 level, but subsequent increases in the limits in 1988 and 1993 further reduced the proportion of claimants affected by limits to all-time lows. As the limits for expenditures increased in real terms, the CCED likely became less progressive. It is important to remember, however, that the CCED is designed to address horizontal rather than vertical equity issues, and that removing deductibility ceilings promotes this objective.

As more mothers of young children entered the labour force in the last 30 years, the CCED became more popular. The CCED limits have been gradually increased in real terms to better reflect the child-care costs parents are facing. The CCED has helped counteract the disincentive to work that untaxed household production

**Figure 15 Predicted CCED Benefit as a Percentage of Earnings, by Earnings Deciles: Two-Parent Families with One Child Under 7, Dual-Earner Families with Child-Care Costs, 1999**



creates. As large numbers of mothers of young children continue to work, it will be important to ensure that horizontal equity is maintained, and the CCED is designed to achieve this objective.

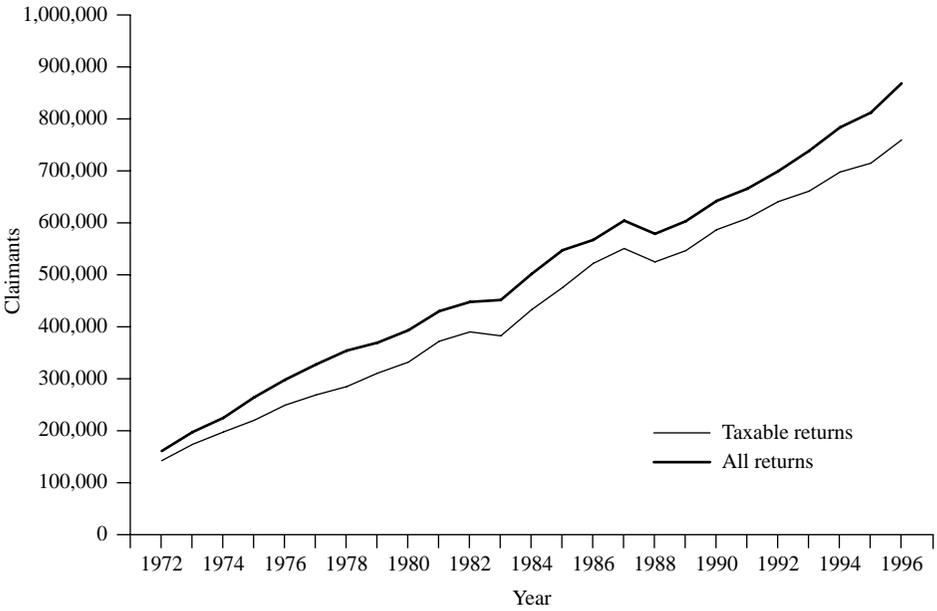
**CONCLUSION**

The tax treatment of child-care expenses is a complex and controversial issue. My analysis in this article of how the CCED fares in terms of horizontal and vertical equity shows that the CCED promotes horizontal equity and is relatively neutral in terms of vertical equity when the focus is on dual-earner families with child-care costs. Since the rationale behind the CCED is to promote horizontal equity, the deduction should not be evaluated on the basis of its vertical equity properties.

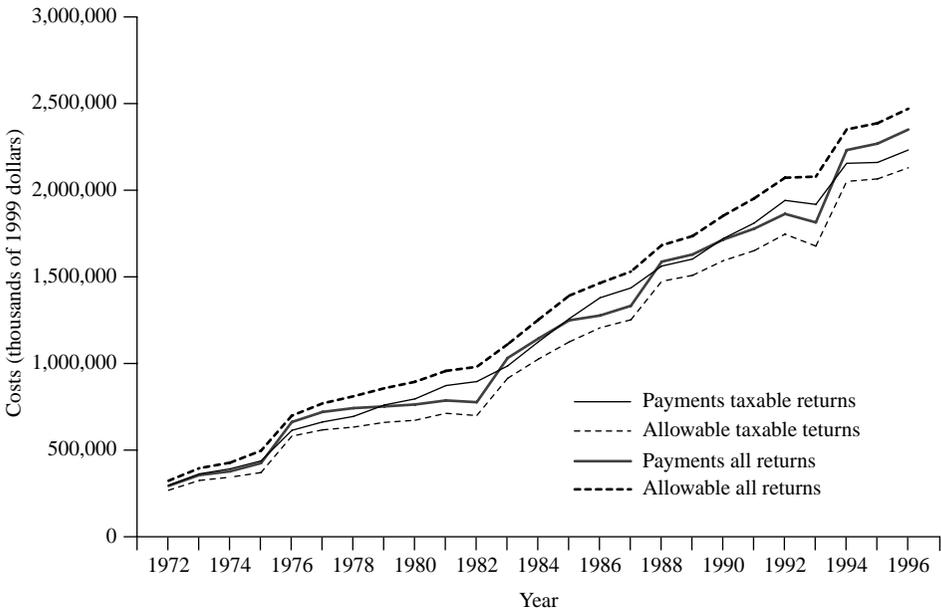
The CCED promotes horizontal equity because it recognizes that parents, in engaging in market work, substitute taxed earnings for valuable but untaxed household production and/or leisure, and that some of the household production must be replaced with costly services. The CCED also recognizes that potential income is a better measure of the household’s opportunity set and ability to pay than actual income.

Although the CCED promotes horizontal equity between families with children who have different labour supply choices, it does not address the issue of horizontal equity between families with children and those without. This issue can

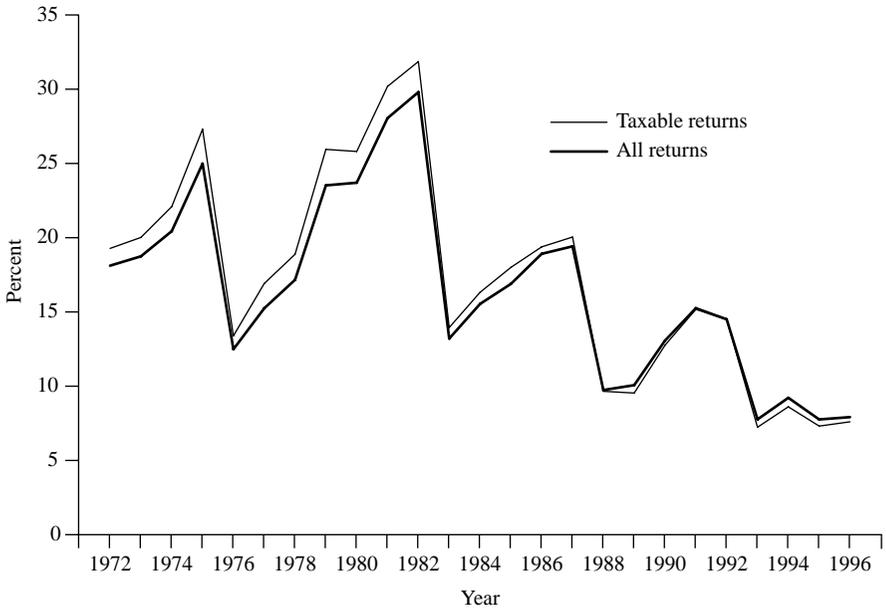
**Figure 16 Number of CCED Claimants, 1972-1996**



**Figure 17 Reported and Allowed Claimant Child-Care Costs (Thousands of 1999 Dollars), 1972-1996**



**Figure 18 Percentage of Constrained Returns**



only be addressed through universal measures that favour families with children over families or individuals without children.

The CCED fares reasonably well in terms of vertical equity. The analysis here of this issue is restricted to potential beneficiaries of the CCED (workers who use paid child care) because it is recognized that vertical equity is not the objective of the CCED.

The CCED also fares well in terms of vertical equity in that it results in a higher discretionary income for the lower-income earner within a household, and may result in higher expenditures on child care. This is an important result if discretionary income has anything to do with distribution within the household and if increases in parental expenditures on child care lead to an increase in the quality of child care and the welfare of children.

This article has not attempted to evaluate how the CCED fares relative to alternatives such as child-care subsidies, because the policy objectives of child-care subsidies generally differ from those of the CCED.<sup>67</sup> Nevertheless, it is clear that if child-care costs for working parents were fully funded by governments, the CCED would no longer be needed.

**APPENDIX A CCED LIMITS, 1972-1999<sup>a</sup>**

Year	Nominal dollars						Constant 1999 dollars					
	Maximum annual deduction			Weekly limit			Maximum annual deduction			Weekly limit		
	Child age	8-13	Max. family	Child age	8-13	Max. family	Child age	8-13	Max. family	Child age	8-13	Max. family
1972	500	500	2,000	15	15	2,119	2,119	8,475	64	64	8,475	64
1973	500	500	2,000	15	15	1,970	1,970	7,881	59	59	7,881	59
1974	500	500	2,000	15	15	1,776	1,776	7,105	53	53	7,105	53
1975	500	500	2,000	15	15	1,603	1,603	6,413	48	48	6,413	48
1976	1,000	1,000	4,000	30	30	2,982	2,982	11,930	89	89	11,930	89
1977	1,000	1,000	4,000	30	30	2,762	2,762	11,047	83	83	11,047	83
1978	1,000	1,000	4,000	30	30	2,535	2,535	10,139	76	76	10,139	76
1979	1,000	1,000	4,000	30	30	2,323	2,323	9,291	70	70	9,291	70
1980	1,000	1,000	4,000	30	30	2,109	2,109	8,435	63	63	8,435	63
1981	1,000	1,000	4,000	30	30	1,876	1,876	7,504	56	56	7,504	56
1982	1,000	1,000	4,000	30	30	1,692	1,692	6,769	51	51	6,769	51
1983	2,000	2,000	8,000	60	60	3,198	3,198	12,793	96	96	12,793	96
1984	2,000	2,000	8,000	60	60	3,065	3,065	12,261	92	92	12,261	92
1985	2,000	2,000	8,000	60	60	2,947	2,947	11,787	88	88	11,787	88
1986	2,000	2,000	8,000	60	60	2,830	2,830	11,319	85	85	11,319	85
1987	2,000	2,000	8,000	60	60	2,712	2,712	10,847	81	81	10,847	81
1988	4,000	4,000	na	120	120	5,212	2,606	na	156	78	na	156
1989	4,000	4,000	na	120	120	4,966	2,483	na	149	74	na	149
1990	4,000	4,000	na	120	120	4,737	2,369	na	142	71	na	142
1991	4,000	4,000	na	120	120	4,487	2,244	na	135	67	na	135
1992	4,000	4,000	na	120	120	4,420	2,210	na	133	66	na	133

(Appendix A is concluded on the next page.)

**Appendix A Concluded**

Year	Nominal dollars						Constant 1999 dollars					
	Maximum annual deduction			Weekly limit			Maximum annual deduction			Weekly limit		
	Child age		Max. family	Child age		Weekly limit	Child age		Max. family	Child age		Weekly limit
	<7	8-13		<7	8-13		<7	8-13		<7	8-13	
1993	5,000	3,000	na	150	90	5,427	3,256	na	163	98		
1994	5,000	3,000	na	150	90	5,417	3,250	na	163	98		
1995	5,000	3,000	na	150	90	5,302	3,181	na	159	95		
1996	5,000	3,000	na	150	90	5,217	3,130	na	157	94		
1997	5,000	3,000	na	150	90	5,135	3,081	na	154	92		
1998	7,000	4,000	na	175	100	7,122	4,070	na	178	102		
1999	7,000	4,000	na	175	100	7,000	4,000	na	175	100		

na not applicable.

<sup>a</sup> The limits apply federally and to all provinces and territories except for Quebec.

Sources: *Canadian Master Tax Guide*, 34th through 51st eds. (North York, Ont.: CCH Canadian, 1975 through 1996); Canada Customs and Revenue Agency form T77B E (97-99), Child Care Expense Deduction; and *The National Finances, 1970-71 and 1971-72* eds. (Toronto: Canadian Tax Foundation, 1971 and 1972).

**APPENDIX B HOURLY COST OF CARE EQUATION**

The hourly cost of care equation for child-care expense claimants (*t*-statistic in brackets) is as follows:

$$\begin{aligned}
 \text{Hourly cost} = & 0.793 + 0.044*\textit{dawage} + 0.352*\textit{wnc02} + 0.152*\textit{wnc35} \\
 & (6.39) \quad (3.03) \quad (12.85) \quad (6.25) \\
 & + 0.043*\textit{wnc612} - 0.013*\textit{whrsm3} + 0.000*\textit{whrs3sq} \\
 & (1.50) \quad (-6.91) \quad (4.93) \\
 & - 0.003*\textit{whrs35} + 0.000*\textit{whrs35sq} - 0.002*\textit{whrsbg6} \\
 & (-1.74) \quad (0.70) \quad (-1.02) \\
 & + 0.000*\textit{whrsbg6q} \\
 & (1.22)
 \end{aligned}$$

where

- dawage* = designated adult predicted wage;
- wnc02* = *dawage*\*number of children less than 3 years old;
- wnc35* = *dawage*\*number of children 3 to 5 years old;
- wnc612* = *dawage*\*number of children 6 to 12 years old;
- whrsm3* = *dawage*\*designated adult usual hours\*number of children less than 3 years old;
- whrs3sq* = *dawage*\*(designated adult usual hours)<sup>2</sup>\*number of children less than 3 years old;
- whrs35* = *dawage*\*designated adult usual hours\*number of children 3 to 5 years old;
- whrs35sq* = *dawage*\*(designated adult usual hours)<sup>2</sup>\*number of children 3 to 5 years old;
- whrsbg6* = *dawage*\*designated adult usual hours\*number of children 6 to 12 years old; and
- whrsbg6q* = *dawage*\*(designated adult usual hours)<sup>2</sup>\*number of children 6 to 12 years old.

It is assumed that hourly cost depends on the designated adult's wage, hours of work, and number of children in various age groups. The adjusted *R*<sup>2</sup> for the equation is 0.30.

**APPENDIX C LOG-WAGE EQUATION COEFFICIENTS<sup>a</sup>**

Variables	Married female		Single female		Married male		Single male	
	Coeff.	<i>t</i> -stat.	Coeff.	<i>t</i> -stat.	Coeff.	<i>t</i> -stat.	Coeff.	<i>t</i> -stat.
Constant <sup>b</sup> .....	1.834	60.30	1.701	49.32	2.194	27.09	1.709	27.56
Age of mother								
25-34 .....	0.208	9.48	0.383	17.39	0.234	9.42	0.416	9.24
Age of mother								
35-44 .....	0.293	13.16	0.481	22.41	0.346	7.95	0.795	16.73
Age of mother								
45+ .....	0.233	8.20	0.423	8.99	0.325	4.42	0.420	4.45
Completed high school .....	0.174	11.96	0.128	4.52	0.132	5.61	0.187	4.18
Some post-secondary education .....	0.260	13.19	0.177	6.34	0.228	6.03	0.234	4.74
Post-secondary diploma .....	0.386	21.24	0.364	10.75	0.277	7.50	0.351	6.03
University degree ...	0.699	34.31	0.595	13.12	0.402	18.91	0.568	8.88
Number of children under 16 <sup>c</sup> .....	-0.018	-2.14	-0.039	-3.57	0.003	0.42	-0.008	-0.60
Immigrant, speaks French or English .....	-0.042	-2.03	-0.024	-0.80	-0.047	-2.56	-0.018	-0.32
Immigrant, speaks other language ...	-0.098	-5.98	-0.212	-6.86	-0.115	-4.36	-0.189	-3.09
British Columbia ...	-0.015	-0.86	-0.045	-1.61	0.004	0.20	-0.016	-0.32
Alberta .....	-0.036	-2.02	0.007	0.26	-0.046	-1.78	0.047	1.24
Manitoba/Saskatchewan ...	-0.110	-5.61	-0.048	-1.54	-0.128	-4.34	-0.106	-2.04
Quebec .....	0.009	0.63	-0.029	-1.18	-0.048	-3.94	-0.022	-0.58
Atlantic .....	-0.021	-11.03	-0.224	-6.94	-0.218	-12.26	-0.158	-3.12
Lambda <sup>d</sup> .....	0.032	0.76	0.043	0.66	0.165	0.54	0.283	1.25
<i>n</i> .....	7,177		2,267		8,550		1,665	

<sup>a</sup> The regression is done for the subset of the 1988 Labour Market Activity Survey (LMAS) that includes individuals with children under 16 years of age. It is restricted to individuals who have annual-earnings and hours-worked information.

<sup>b</sup> The coefficient on the constant of 1.834 represents the base log-wage rate for a mother less than 25 years of age who did not complete high school and who lives in Ontario. This base rate would be reduced by 0.018 for each child the mother has.

<sup>c</sup> Although the LMAS provides information on the number of children under 16, the corresponding variable in the CNCCS is the number of children under 17.

<sup>d</sup> Lambda is the inverse Mills ratio from a probit on the probability of having worked for pay. Lambda is used to account for potential self-selection bias, although the insignificant *t*-statistic on the coefficients for lambda indicates that self-selection is not an issue.

**APPENDIX D PLOTNICK'S PREORDERED INEQUITY INDEX**

Table D1 shows Plotnick's Preordered Inequity Index (PII)<sup>68</sup> using unweighted data.<sup>69</sup> The index is calculated as follows. The area below the standard Lorenz curve<sup>70</sup> for post-tax income is deducted from the area below the preordered Lorenz curve. This difference is normalized. The preordered Lorenz curve consists of a post-tax income Lorenz curve where families are ranked according to their initial pre-tax income ranking rather than according to their post-tax income ranking. The normalization factor is twice the difference between one-half and the area below the standard Lorenz curve, times 100, which yields an index that ranges from zero to 100; an increase in the index indicates an increase in inequity. Plotnick calculates the PII for certain income and tax and transfer measures and finds very low values ranging from 0.2 to 1.8.

**Table D1 Preordered Inequity Index**

	1988		1999	
	Actual income	Potential income	Actual income	Potential income
Without the CCED .....	0.0027	0.0124	0.0056	0.0169
With the CCED .....	0.0032	0.0098	0.0060	0.0141
Percentage change .....	17%	-21%	8%	-17%

In this analysis, the only transfer payments that are included are the child tax benefit and other refundable tax credits. With the majority of transfer payments excluded, the calculated indices are extremely low. Furthermore, the analysis is restricted to two-parent families with at least one child under 6 years of age; this is done to increase homogeneity and to coincide with the results shown in figures 3 to 6. Indices are calculated for 1988 and for 1999. There is an index for actual and for potential income, with and without the CCED.<sup>71</sup> The results indicate that the CCED increases horizontal equity when potential income is the measure of ability to pay, but reduces horizontal equity when actual income is the measure of ability to pay. This result is consistent with the results of methods using other analytical tools.

**APPENDIX E KAKWANI INDEX**

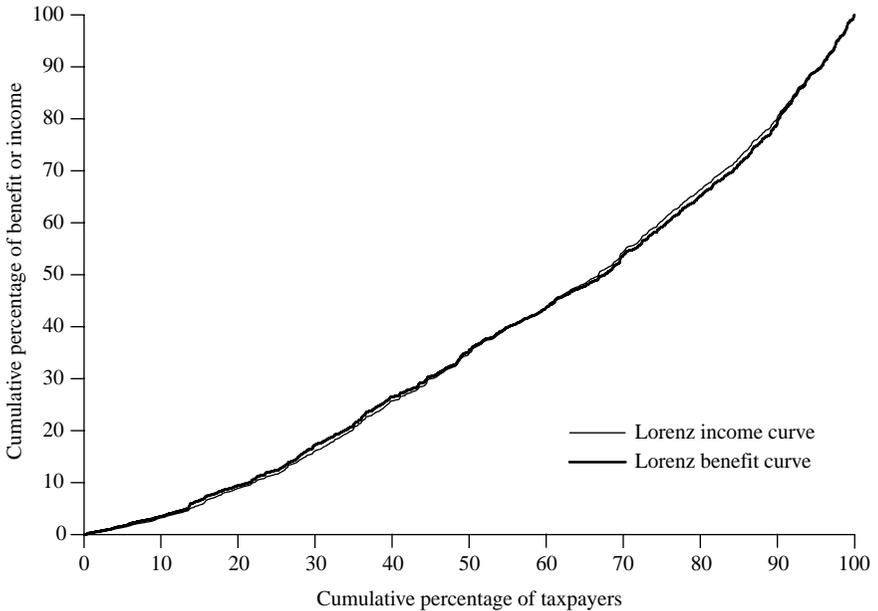
The Kakwani<sup>72</sup> index is based on the Lorenz curve. Two such curves are illustrated in figure E1. The index is calculated as twice the area below the benefit curve less the area below the income curve.<sup>73</sup> In this particular case, since the two curves almost coincide, the index is nearly zero. This implies that the benefit is neutral or proportional to income. A benefit curve lying above the income curve generates a positive index, indicating progressivity of the benefit, while a benefit curve lying below the income curve generates a negative index, indicating regressivity of the benefit. The index is calculated as follows:

$$K = 2\int B(T)dT - 2\int Y(T)dT,$$

where the integral is evaluated from 0 to 1, and

- $T$  = cumulative percentage of taxpayers,
- $B(T)$  = Lorenz curve for CCED benefits, and
- $Y(T)$  = Lorenz curve for pre-tax income.

**Figure E1 Kakwani Index, 1999 Potential Income**



### Notes

- 1 The analysis of vertical equity looks at families with children under 7 years of age because of how the tax rules are applied. The analysis of horizontal equity is restricted to families with children under the age of 6 because this group is most likely to face high child-care costs.
- 2 In this article, “earnings” and “income” are often used interchangeably because the analysis includes no estimates of non-labour income.
- 3 For an excellent description of the current provisions under section 63 of the Income Tax Act, see Debra Gordon, “Child-Care Expense Deduction” (1999), vol. 47, no. 6 *Canadian Tax Journal* 1588-1626, at 1591.
- 4 In 2000, earned income includes employment income; self-employment income; the taxable part of scholarships, bursaries, fellowships, and similar awards; net research grants; and certain earnings supplements and disability benefits. Earned income does not include property income (dividends or interest income) or regular employment insurance benefits.
- 5 See *Canadian Master Tax Guide*, 34th through 51st eds. (North York, Ont.: CCH Canadian, 1975 through 1996); *The National Finances*, 1970-71 and 1971-72 eds. (Toronto: Canadian Tax Foundation, 1971 and 1972); and Canada Customs and Revenue Agency (formerly Revenue Canada), form T778 E(1997 through 1999), Child Care Expense Deduction.
- 6 Canada, Department of Finance, *Government of Canada Tax Expenditures 1999* (Ottawa: Supply and Services, 1999), 72.
- 7 Supra note 5.
- 8 Canada Customs and Revenue Agency, form T778 E(1996), Child Care Expense Deduction.
- 9 Supra note 6, at 72.
- 10 These limits are established by the federal government and apply also to all provincial governments and territories that harmonize their tax systems with the federal system. Quebec is the exception. In 1988 Quebec made an effort to harmonize its tax system with the federal system, so the same ceilings were in effect for that year, but in general the CCED deduction rules for Quebec were different from the federal government rules for all other years.
- 11 The theory summarized here is based on a one-period model that does not allow for savings.
- 12 I heard a similar example quoted many years ago, but I cannot recall the source.
- 13 Assuming that the nanny is a live-in nanny.
- 14 The after-tax income and household services cost situation in scenario 1 improves when the nanny’s earnings are lower for a given widower’s wage, since the nanny pays tax on her wage.
- 15 How could the tax system be neutral? Taxing the stay-at-home parent for the imputed value of her home production and giving the working parent an equivalent deduction while also allowing the higher-income earner in the dual-earner family a similar deduction to defray home production replacement costs would result in neutrality. Alternatively, simply taxing the imputed value of home production and providing no deductions to either type of family would be horizontally neutral in the labour supply dimension—but not in the childless versus with-children dimension.
- 16 William M. Gentry and Alison P. Hagy, “The Distributional Effects of the Tax Treatment of Child Care Expenses,” in Martin Feldstein and James M. Poterba, eds., *Empirical Foundations of Household Taxation* (Chicago: University of Chicago Press, 1996), 99-128.
- 17 Gentry and Hagy define income as the monetary value of increases in potential consumption net of the costs incurred to earn that income.
- 18 Gentry and Hagy also point out that the argument for any tax consideration of child-care expenses is weakened when a longer time horizon is used—for example, when the family-planning stage is included.

- 19 Restricting the analysis to families with children avoids from the life-cycle earnings issue.
- 20 Gentry and Hagy define potential labour income as the parents' wage rate (imputed if not available) times 50 hours per week for 52 weeks per year.
- 21 Martin Feldstein and Daniel R. Feenberg, "The Taxation of Two-Earner Families," in *Empirical Foundations of Household Taxation*, supra note 16, 39-73.
- 22 *Ibid.*, at 41.
- 23 Michael Krashinsky and Gordon Cleveland, *Tax Fairness for One-Earner and Two-Earner Families: An Examination of the Issues*, CPRN Discussion Paper no. F/07 (Ottawa: Canadian Policy Research Networks, 1999).
- 24 Carole Vincent and Frances Woolley, "Taxing Canadian Families: What's Fair, What's Not" (2000), vol. 6, no. 5 *Choices* 3-44.
- 25 Kenneth J. Boessenkool, "Putting Tax Policy in Its Place: How Social Policy Took Over the Tax Treatment of the Family," in Douglas W. Allen and John Richards, eds., *It Takes Two: The Family in Law and Finance*, Policy Study 33 (Toronto: C.D. Howe Institute, 1999), 129-69, at 161.
- 26 Kenneth J. Boessenkool and James B. Davies, *Giving Mom and Dad a Break: Returning Fairness to Families in Canada's Tax and Transfer System*, Commentary no. 117 (Toronto: C.D. Howe Institute, November 1998), 24.
- 27 RSC 1985, c. 1 (5th Supp.), as amended.
- 28 Supra note 3, at 1599. Although the CCED is the principal federal funding mechanism for child care, direct provincial subsidies to child care exceed combined federal and provincial tax expenditures on child care through the CCED.
- 29 Peter W. Hogg and Joanne E. Magee, *Principles of Canadian Income Tax Law*, 2d ed. (Scarborough, Ont.: Carswell, 1997), 142.
- 30 The 1988 Canadian National Child Care Survey indicates that 83 percent of stay-at-home designated adults were out of the labour force rather than unemployed. See Statistics Canada, *National Child Care Survey*, catalogue no. 89M0006XDB (Ottawa: Statistics Canada, 1988).  
The fact that a person is unemployed should not impede her ability to enjoy leisure or engage in household production; however, a relatively small percentage of individuals may be unable to work because of illness or other handicaps, which should not detract from the overall analysis.
- 31 This argument ignores the fact that home child-care "costs" are already being subsidized by not being taxed. Boessenkool and Davies, supra note 26, also make this point.
- 32 Christine Hung, "Thoughts on Tax Reform and Policy: The Deduction for Childcare Expenses" (January 1998), vol. 15 *Canadian Family Law Quarterly* 251-316.
- 33 (1993), 110 DLR (4th) 470 (SCC).
- 34 Claire F.L. Young, "Child Care and the Charter: Privileging the Privileged" (1994), vol. 2, no. 1 *Review of Constitutional Studies* 20-38.
- 35 Rosanne Altshuler and Amy Ellen Schwartz, "On the Progressivity of the Child Care Tax Credit: Snapshot Versus Time-Exposure Incidence" (1996), vol. 49, no. 1 *National Tax Journal* 55-71.
- 36 Supra note 16.
- 37 Revenue Canada, *Taxation Statistics* (Ottawa: Supply and Services, 1974 through 1998); *Tax Statistics on Individuals* (Ottawa: Supply and Services, 1995 through 1997); and *Income Statistics* (Ottawa: Public Works and Government Services, 1998).
- 38 Note that vertical equity, as discussed in this section, is evaluated using actual income rather than potential income as the measure of ability to pay.
- 39 Supra note 37.

- 40 See appendix B for the equation and its coefficients.
- 41 For a discussion of the supply of child care, see David M. Blau, "The Supply of Child Care Labor" (1993), vol. 11, no. 2 *Journal of Labor Economics* 324-47.
- 42 The average hourly cost of care for families who pay for care but do not categorically plan to claim is \$1.56, and \$2.49 for those who pay and plan to claim. The "grossed-up" average for the first group is \$2.27 per hour based on the equation in appendix B.
- 43 Lambda is not used to calculate the predicted wage; the calculation yields an unbiased estimate of the wage for workers *and* non-workers; unbiased wage estimates of *workers only* can also be obtained by including lambda in the calculation. Lambda is included as a regressor in the wage equation because the wage equation is estimated using data for workers only, but is used to predict wages for both workers and non-workers. Lambda is the hazard rate or inverse Mills ratio from a probability-of-work probit. See Mark R. Killingsworth, *Labor Supply* (New York: Cambridge University Press, 1983), 143.
- 44 Family allowances are allocated to the higher-income earner.
- 45 Sources for tax information include Karin Treff and David B. Perry, *Finances of the Nation 1999* (Toronto: Canadian Tax Foundation, 1999); *Canadian Master Tax Guide*, 44th and 45th eds. (North York, Ont.: CCH Canadian, 1989 and 1990); and Thorne Ernst & Whinney, *Tax Facts: 1988-1989* (Don Mills, Ont.: De Boo, 1989).
- Although the base amount for the Canada child tax benefit for Alberta differs by age group, the Canadian benefit is used. The data do not identify children who are 17 years old—these children are omitted in calculations where they might otherwise be included.
- 46 Families with children of preschool and kindergarten age are the ones most likely to have significant child-care costs when parents work outside the home.
- 47 Plotnick indices are calculated for these series, which are discussed in appendix D. See Robert Plotnick, "A Measure of Horizontal Inequity" (1981), vol. 63, no. 2 *The Review of Economics and Statistics* 283-88.
- 48 Family allowances for 1988 are included in the calculation of taxes but are treated as neither income nor a benefit (or tax reduction) when tax rates are calculated. Family allowances were not affected by the CCED, but the child tax credit is.
- 49 Krashinski and Cleveland, *supra* note 23, make this point. I am thankful to Gordon Cleveland and Jon Kesselman for observing that the attainment of vertical equity is not the goal of the CCED. Other child-care programs such as child-care subsidies and other social programs such as social assistance, as well as progressive income taxation, are specifically designed to address vertical equity issues.
- 50 "Income" refers to total income before deductions; the empirical work in this study focuses solely on predicted employment and self-employment income and excludes property income.
- This equation works provided that the CCED does not cause the taxpayer to move into a different tax bracket; otherwise, the benefit will be a weighted average of two different marginal tax rates.
- 51 The analysis can be extended to all users of paid child care if we assume that benefits are derived from either the tax system or the lower fees of care providers who do not issue receipts.
- 52 It is important to note, however, that low-income potential claimants do not receive any benefit either because they have no tax liability or, more rarely, because their child-care costs are unusually large in relation to their earnings.
- 53 Note that since predicted and potential earnings are based on a predicted wage rate, the earnings range is narrower than it would have been if actual wage rates had been used.
- 54 The results are similar for families with two children under 7 years of age.

- 55 For a discussion of this index and its antecedents, see Alexander M.G. Gelardi, "The Progressivity of Helping Families with Children: The Canadian Experience, 1985-1994" (1999), vol. 11 *Advances in Taxation* 61-88. See appendix E for information on how this index was derived.
- 56 The CNCCS data are weighted data. Using weights in the calculation of the index results in the repetition of each observation  $n$  times, where  $n$  is the observation's weight. This tends to reduce the variance of the income and benefit distribution.
- 57 Victor R. Fuchs, "Women's Quest for Economic Equality" (1989), vol. 3, no. 1 *The Journal of Economic Perspectives* 25-41.
- 58 Shelley A. Phipps and Peter S. Burton, "Collective Models of Family Behaviour: Implications for Economic Policy" (1996), vol. 22, no. 2 *Canadian Public Policy* 129-43. They provide an excellent overview of the literature on decision making within households.
- 59 Morley Gunderson and W. Craig Riddell, *Labour Market Economics: Theory, Evidence, and Policy in Canada*, 3d ed. (Toronto: McGraw-Hill Ryerson, 1993), 98-99; and Statistics Canada, *Labour Force Annual Averages, 1989-94*, catalogue no. 71-529-XPB, at B-43.
- 60 Statistics Canada, CANSIM database, matrices D984596 and D984644.
- 61 See the Statistics Canada Web site at <http://www.statcan.ca/english/Pgdb/People/Labour/labor24c.htm>.
- 62 Statistics Canada, *The Daily*, June 9, 1998, catalogue no. 11-001E.
- 63 Supra note 37.
- 64 "Taxable returns" are those that result in a tax liability; "all returns" include returns that do not result in a tax liability.
- 65 Supra note 37; and Statistics Canada, *The Consumer Price Index*, catalogue no. 62-001-XPB.
- 66 Supra note 37.
- 67 For a discussion of child-care subsidies and their goals, see Gordon H. Cleveland and Douglas E. Hyatt, *Subsidies to Consumers or Subsidies to Providers: How Should Governments Provide Child Care Assistance?* Working Paper no. R-97-7F (Ottawa: Human Resources Development Canada, Applied Research Branch, March 1997).
- 68 Supra note 47.
- 69 Weighted data would not allow identification of rerankings.
- 70 Lorenz curves are illustrated in appendix E.
- 71 Although changing the tax system (for example, by eliminating the CCED) would likely generate behavioural responses that would affect actual family income, I do not attempt to model these responses in this article.
- 72 Supra note 55.
- 73 This modified version of the Kakwani index is used for tax benefits rather than tax costs. For tax costs, the signs of the areas are inverted.