

# The Integration of Child Tax Credits and Welfare: Evidence from the Canadian National Child Benefit Program\*

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## Abstract:

In 1998, the Canadian government introduced a new child tax credit. The innovation in the program was its integration with social assistance (welfare). Some provinces agreed to subtract the new federally-paid benefits from provincially-paid social assistance, partially lowering the welfare wall. Other provinces did not integrate benefits, providing a quasi-experimental framework for estimation. We find large changes in social assistance take-up and employment in provinces that provided the labour market incentives to do so. In our sample, the integration of benefits can account for between 19 and 27 percent of the decline in social assistance receipt between 1997 and 2000.

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# 1. Introduction

Policies such as the Earned Income Tax Credit (EITC) and the Medicaid Health Insurance Program in the US have targeted low-income families with children as priority recipients of government assistance. In Canada, the Canada Child Tax Benefit and the National Child Benefit (NCB) have similarly been designed to provide assistance primarily for families with children. Along with the goal of providing assistance to these families, both the EITC and the NCB have also been designed to encourage parents to participate in the labour force, with the long-term objective of helping these families provide for themselves instead of receiving transfers.

This type of ‘welfare to work’ tax credit typically focuses on the working poor, rather than the very poorest in society. Some of this emphasis derives from a concern about the efficiency cost of transfers to the poor.<sup>1</sup> While the poorest may be the most deserving, the loss of output generated by making transfers to them could exceed the value to society of the redistribution. Other motivations for these policies include broader measures of the costs of large transfers to non-workers, such as the effects of long-run dependency and stigmatization.<sup>2</sup>

Recently, Saez (2002) has shown that earnings subsidies to the working poor are preferred to direct transfers to the poorest when the extensive labour market margin is more elastic. The result comes from the high marginal tax rates that accompany direct transfers, as the high tax-back rates serve to discourage any labour market participation

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<sup>1</sup> See Immervoll et al. (forthcoming) for an extensive discussion of the efficiency-equity tradeoff in the context of child benefits.

<sup>2</sup> Ventry (2000) provides a detailed history of the political and economic debates that have accompanied the introduction and growth of the EITC in the United States.

among recipients. One of the important goals for empirical researchers, therefore, is to examine the magnitude of the extensive participation responses to labour market policies.

Most of the empirical literature has examined the labour market effects of the EITC in the United States. Because the EITC is a federal program, these studies have tended to rely on variation in the program over time (Eissa and Liebman, 1996, Meyer and Rosenbaum, 2001), or on variation within the program across families (Eissa and Hoynes, 2004, Dickert, Houser and Scholz, 1995). Hotz and Scholz (2003) summarize the findings from these and other studies and draw the following broad conclusions: the EITC positively affects labour force participation of single-parent households and these effects are substantial. The EITC has a modest negative effect on labour force participation for secondary workers in two-parent families. Finally the EITC has a negative effect on hours worked for those already in the labour force, although the negative hours effect, in the aggregate, is smaller than the participation effect.

Research on European working tax credits is more limited. In the United Kingdom, Bingley and Walker (1997) find that the Family Credit increased part-time work, while Blundell et al. (2000) simulate the effects of the Working Family Tax Credit (WFTC), uncovering positive work effects for single mothers but negative effects for married women. Several other European countries have introduced, or have plans to introduce, similar measures. Immervoll et al. (forthcoming) describe the pan-European landscape and simulate the effects of in-work versus universal benefits, concluding that universal benefits are only preferred if the government has a very large taste for redistribution.

In our paper, we examine the labour market effects of the National Child Benefit program in Canada. The unique feature of the NCB relative to policies in other countries

is its integration with social assistance (welfare) payments. Some provinces agreed to subtract the federally-paid National Child Benefit Supplement benefits from provincially-provided social assistance payments. This structure allowed former welfare recipients to carry part of their total social assistance payments with them into the work force, effectively lowering the ‘welfare wall’ of high tax rates that faces welfare recipients. Other provinces chose not to deduct the new federal benefit from recipients’ social assistance cheques, meaning that the National Child Benefit did not directly affect the welfare wall. As a result, we have a large and transparent source of identifying variation on which to base our estimates. In addition to the integration of benefits, several provinces introduced small earned income supplements as part of the National Child Benefit program. Using this variation, we are able to compare the relative efficacy of these two methods of improving labour market incentives.

We calculate the federal and provincial benefits available to each family in our data using a detailed tax and benefit simulator for the Canadian tax system. This allows us to directly estimate the marginal effects of changes in the NCB on labour force participation, social assistance receipt, hours worked, total earnings, and social assistance dollars. The continuity of the measures available offers an improvement over an approach that simply compares outcomes across discrete test and control groups.

Our findings suggest that there were strong labour market effects from the integration of child benefits with welfare for single mothers. An additional \$1,000 in benefits deducted from social assistance payments is associated with a 3.4 to 4.7 percentage point decrease in social assistance take-up, and a 3.3 to 4.6 percentage point increase in having worked. Evidence for earnings and weeks of work on the intensive margin is much weaker, with no strong evidence of a response. Both of these findings are

consistent with theory and the previous literature. Further, we find less evidence for an effect of the provincial earned income benefit programs on work incentives. We speculate that this may be related to the relative visibility of the earned income benefits versus the social assistance integration.

The rest of the paper proceeds as follows: Section 2 explains the National Child Benefit Program in detail. Section 3 presents our empirical strategy; section 4 describes the data sets and tax information used in our analyses. Sections 5 and 6 present our results, and section 7 concludes.

## 2. The National Child Benefit Program

The National Child Benefit (NCB) program was introduced in July, 1998 as a component of the Canada Child Tax Benefit. The NCB encompasses two programs, a federally-provided refundable tax-credit (called the National Child Benefit Supplement – NCB Supplement) and provincially-provided initiatives. The stated goals of the program were to reduce child poverty, promote attachment to the labour force, and reduce overlap between federal and provincial initiatives (Department of Finance 1997). Unlike programs such as the EITC, the integration and combination of benefits in the National Child Benefit program provides assistance not just to working families but also to non-working families. However, the net effect of the program in many provinces was similar to the EITC – it provided a subsidy to enter the labour force.

The annual benefit amount in 1998 was \$605 for the first child, \$405 for the second, and \$330 for the third and additional children. The benefits are reduced with

family income, starting at a threshold of \$20,921 (for 1998).<sup>3</sup> The reduction rates were set such that the benefit would be reduced to zero when income reached \$25,921 for all family sizes.<sup>4</sup> For example, starting in 1998 a family with 2 children and income of \$25,000 would receive \$186.04 annually (\$1,010 for two children; reduced by 20.2% of \$4,079).

Figure 1 traces out the benefits as a function of family income. Importantly for our empirical strategy, the incentive to work (so long as income is less than \$25,921) differs sharply by the number of children. In 2002-03, the federal government spent \$7.8 billion on the Canada Child Tax Benefit. This amount represented a real increase of 32 percent over the amount spent in 1997-1998.<sup>5</sup> Most of this increase was a result of the introduction and subsequent expansions of the NCB Supplement.

At a province's discretion, the NCB Supplement benefits could be integrated with provincial social assistance programs by deducting the NCB Supplement from social assistance payments dollar for dollar. Five of the ten provinces (Prince Edward Island, Nova Scotia, Ontario, Manitoba, and Alberta) chose to integrate their benefits in this way. We designate these five provinces as the 'clawback' provinces.

For the provinces that did not subtract the NCB from social assistance payments, more clarification is necessary. The simplest cases are New Brunswick and Newfoundland, which did not deduct NCB payments at all.<sup>6</sup> More complicated are the

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<sup>3</sup> In this paper, we refer to the reduction of benefits with higher family income as a 'reduction,' while we label the reduction of social assistance resulting from the integration of benefits under the NCB as a 'clawback.' In Canadian policy discussions, both are sometimes referred to as 'clawbacks.' To maintain clarity, we reserve the term 'clawback' to refer to the reduction of social assistance benefits with the NCB.

<sup>4</sup> The reduction rates in 1998 were 12.1% for one child, 20.2 % for two children, and 26.8% for three children.

<sup>5</sup> The dollar amounts are taken from the Public Accounts of Canada (Receiver General of Canada 2003).

<sup>6</sup> A small social assistance reduction in 1999 accompanied the introduction of the Newfoundland and Labrador Child Benefit. This makes it somewhat like the cases of Quebec, Saskatchewan, and British Columbia. More detail is provided in the Appendix.

cases of Quebec, Saskatchewan, and British Columbia. In these three provinces, provincial child benefits (rather than social assistance) are reduced to account for the NCB. Moreover, around the same time these three provinces instituted social assistance reforms that lowered rates. The net effect of these policies may be similar to the NCB, but in order to maintain our focus on the NCB we designate these provinces as ‘no clawback’ provinces since the social assistance amounts are not directly reduced by NCB expansions. Our empirical strategy, however, will check to ensure that these provinces are not confounding our estimates of the effect of the NCB. Specifically, we try including controls that fully account for the social assistance and other child benefit changes introduced over the same time period. More detail on the child benefit policies is provided in the Appendix.

Provincially-provided initiatives comprise the second part of the National Child Benefit program. The initiatives included both spending programs and provincial tax credit programs. The spending programs provided funding for child-care subsidies and health promotion programs, while the tax credits took the form of straight transfers or earned income credits. The provincial credits also affect and provide variation in incentives to work. For example, Ontario provides a Child Care Supplement for Working Families. In 2000, families must have at least \$5,000 of earnings to qualify, and the yearly benefits were \$1,100 + \$210 (per child under the age of seven) if the family is a single parent family. Benefits are then clawed back starting at \$20,000 of family income.

While much of our analysis focuses on the NCB Supplement, we do incorporate the provincial programs into our analysis as they also provide work incentives to mothers. Our analysis therefore allows us to compare the NCB Supplement integration with social assistance to the more EITC-like provincial programs. As these programs differ in both

size and method of delivery, contrasting the two may provide some insight into the relative efficacy of each program structure.

In addition to the earned income benefits, several provinces and the federal government provide a basic level of child benefits that is not tied to employment earnings. As well, there are non-cash programs such as childcare subsidies and health programs provided by the provinces under the NCB. We discuss how these benefits and programs relate to our empirical strategy in Section 3.

Because of our focus on social assistance recipients, a brief overview of social assistance in Canada is warranted.<sup>7</sup> All provinces in Canada operate separate social assistance programs for low-income families. There is considerable variation in both asset tests for eligibility and earnings exemptions by province. For example, in 2002, families in Newfoundland were allowed an earnings exemption of \$150, while families in Ontario were entitled to \$346 plus a percentage of net earnings that varied by family size. The family asset exemption in Ontario for a one-child family was \$1,530, while in Saskatchewan the same size family was entitled to \$3,000 of assets. The unweighted mean of yearly welfare income (including all benefits, both federal and provincial) for a couple with two children in 2002 was \$18,147 with a standard deviation of \$848. There is a small but positive correlation between the generosity of the provincial social assistance program and the probability that a province choose to claw back its benefits with the NCB. Our empirical approach (described in Section 3) accounts for these differences across provinces, and any change in these differences over time.

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<sup>7</sup> This discussion draws on the detailed report on social assistance produced by the National Council on Welfare (2003), to which we refer the reader for more detail.

## Labour Market Incentives

The integration of social assistance benefits under the NCB produces a strong incentive to join the labour market.<sup>8</sup> Figure 2 presents a static labour supply model with a stylized social assistance benefit. With no work, an individual receives social assistance in the amount of AB. Between B and C, extra work results in a dollar-for-dollar decrease in the social assistance benefit – the 100 percent marginal tax rate often called the welfare wall.<sup>9</sup> At C, the social assistance benefit is exhausted and earnings lead to increased consumption until point D. The standard result is represented by points  $X_0$  and B. In the absence of social assistance, someone with the preferences embodied in the utility curves in the figure would prefer to be at point  $X_0$ . With social assistance, point B is preferred, however, and the individual chooses no work.

The line segments EFG represent the change in incentives introduced by the integration of social assistance benefits under the NCB program. Because the 100 percent tax rate now ends earlier at point E, the individual keeps more of his or her earnings for work between points E and G. This may lead the individual to prefer a point such as  $X_1$  instead of point B, meaning that the individual would join the labour force.

Figure 2 also makes clear the ambiguous predictions of the model for those who were already in the labour market when the benefit was introduced. For some of them, the parallel shift of the budget constraint out to EF delivers a work-reducing income effect. For those on the FG segment, both the income and the substitution effects lead to less

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<sup>8</sup> Hotz and Scholz (2003) provide a thorough treatment of the static labour supply incentives in the EITC. Meyer (2002) shows evidence suggesting the response is much stronger on the extensive margin.

<sup>9</sup> As noted above, provincial social assistance programs allow small amounts of income to be earned before social assistance is taxed back. This “set aside” may cause some individuals to prefer to work only small amounts. Figure 2 shows a basic model without this feature, although the main implications of the model are unchanged.

work. Finally, for those operating to the left of point G, there is no change in incentives as the benefit is zero because of their high income.

In addition, the same figure can be used to think about the transfers and spending programs that do not condition on labour market attachment. These benefits are expected to diminish the incentive to work by extending the distance between A and B.

In total, the NCB program provides clear incentives to join the work force for families currently on social assistance by partially replacing social assistance with a benefit that, on net, is only received if working. In addition, the provincially-run earned income supplements provide more incentive to join the labour force. However, in both cases, the prediction for work on the intensive margin is unclear – those already working may face higher marginal tax rates on their labour so they may choose to work less.

### 3. Empirical Strategy

Our empirical strategy relies on differences in benefit levels across groups to identify the effects of the NCB Supplement on female labour supply decisions. While an advantage of this methodology is the transparency of the source of identification, we are not able to incorporate the kinks and twists in the budget constraint generated by child benefit policies as would be the case in structural model of behaviour. However, we believe that our method is fruitful for answering a relatively direct policy question about a small change in benefit incentives within the existing system.<sup>10</sup>

To test if child benefits have affected labour supply decisions, we run regressions of the type

$$Y_{pyki} = \beta_0 + \beta_1 \text{Benefit}_{pyki} + \beta_2 X_{pyki} + \beta_3 \text{prov}_p + \beta_4 \text{year}_y + \beta_5 \text{kids}_k + e_{pyki},$$

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<sup>10</sup> See Angrist and Krueger (2001) for a discussion of identification through natural experiments.

where  $p$  indexes provinces,  $y$  indexes years,  $k$  indexes number of children, and  $i$  indexes families. We observe labour market outcomes  $Y_{pyki}$  for each family and regress them on a measure of that family's observed benefits  $Benefit_{pyki}$ ,<sup>11</sup> a set of province dummies  $prov_p$ , a set of year dummies  $year_y$ , a set of dummies for the number of children (zero through three)  $kids_k$ , and a vector of other relevant controls  $X_{pyki}$ , leaving a residual term  $e_{pyki}$ .

The vector  $X_{pyki}$  contains demographic controls about the family as well as 2<sup>nd</sup> order interaction terms between the province, year, and children dummies. In this standard triple-difference specification, identification of the policy effect comes from variation across province-year-number of children cells; from the excluded province-year-number-of-children interaction. In other words, the policy effect,  $\beta_1$ , is measured by comparing, for example, women in Ontario in 1997 with no kids to those with other numbers of children in the same province in the same year.<sup>12</sup> This strategy is therefore robust to any shock that differentially affects provincial labour markets and may be correlated with the policy variable.

Specifically, provincial spending programs under the NCB typically do not discriminate based on the number of children in the family. Since our strategy compares women with different numbers of children *within* provinces, the NCB spending programs shouldn't affect our estimates. Similarly, if there are other labour market policies we do not consider in our empirical model that vary at the province-year level, our estimates will not be affected so long as the excluded policy affects everyone in a given province in a given year in the same way. To the extent that provincial programs do vary over time

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<sup>11</sup> The different benefit measures we use are discussed in detail later in the paper.

<sup>12</sup> Alternatively conceived, identification comes from comparing across years within province-number-of-children, or across provinces within year-number-of-children.

and across number-of-children, this may bias our results.<sup>13</sup> Finally, if provinces' policy choices were correlated with social assistance take-up rates, political endogeneity might affect our estimates. However, with the province-year controls included, this is only a concern to the extent that the policy decisions reflected the differential trends in social assistance among families of different sizes within a province.

A key assumption underlying this approach is the exogeneity of the province of residence, year, and number of children. For the province, this assumption would be violated if individuals switched provinces in order to benefit from different incentive structures. We consider this possibility unlikely, as the benefits are unlikely to surpass the costs of moving.<sup>14</sup> The number of children may also be influenced by benefits. Assuming that children are exogenous to benefits is standard in the EITC literature in the US (see Hotz and Scholz 2003), but the assumption may be violated if fertility decisions depend on fiscal incentives. Milligan (2005) found strong evidence that fertility did respond to fiscal incentives in Quebec's Allowance for Newborn Children program in the late 80s and early 90s, but found much less evidence of a response among women more likely to be at-risk for being on welfare.

We pursue two strategies to account for the possibility of endogenous fertility. First, we present our results using only the province-year variation in the benefits, finding results consistent with those that also incorporate the variation induced by the number of children. Second, we also present results excluding children under age 6. Since the NCB program was introduced in 1998 and our data run only until 2000, the decision to have

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<sup>13</sup> Information on the provincial spending programs is available from Federal, Provincial, and Territorial Ministers Responsible for Social Services (2003). Examples of provincial programs which vary by number-of-children do exist, the PEI drug benefit, for example, but these benefits tend to be small in comparison to the main NCB program amounts.

<sup>14</sup> This claim is supported by recent empirical evidence in Gelbach (2004) who concludes that “. . . evidence suggests little reason for concern (due to welfare migration) in using cross-state variation in welfare generosity to identify incentive effects of the welfare system on other outcome variables.”

the older children clearly preceded the introduction of the program and therefore could not have been influenced by its incentives.

Some of our dependent variables are binary, so our estimation uses a linear probability model. Blundell and Powell (2004) compare a semi-parametric control function approach to linear probability and probit results, finding the parametric models estimate a slope that is too steep. Their method requires a parsimonious set of covariates in order to be tractable, so it is not appropriate for our policy framework which requires a large set of controls to isolate the policy effect. However, their findings may suggest some caution in the interpretation of our results.

### Endogeneity of benefits

The observed benefit depends on the province, year, number of children, and income of the family. Importantly, family income is determined by many of the outcomes we intend to study as regressands, such as earnings, hours, and weeks worked. This introduces a mechanical endogeneity between observed benefits and the measures of labour supply.

To overcome the endogeneity problem, we implement an instrumental variables strategy similar to one pioneered by Currie and Gruber (1996). The essence of the strategy is to form an instrument that simulates benefits using only the exogenous determinants of benefits. As no particular family's income influences the simulated benefit, the mechanical endogeneity is purged. Because the system is exactly identified, no overidentification tests are possible. Instead, the credibility of the instrument strategy rests on the plausibility of the assumed exogeneity of the determinants of benefits.

In our case, we argued earlier that the province of residence, year, and number of children are exogenous components. To form our instrument, we take a sample of families and calculate the benefits for each province-year-number of children combination. The simulation sample is a 10 percent random sample of the families in our five years of SLID data. As we have 5 years of data, 10 provinces, and 4 family sizes (0 to 3 children), this means that we must perform 200 benefit simulations for each family in the simulation sample. Importantly, the same set of families is put through the benefit calculator for each province-year-children combination, meaning that the benefits calculated in each cell do not embody differences in income or other characteristics across cells. The mean benefit over the simulation sample of families in each cell is then matched back to the original dataset by province, year and number of children to be used as the instrument. It can be expected to predict well each family's benefit, but will not depend on a particular family's observed labour market outcomes. The process is repeated over province-year cells to form our province-year simulated instrument.

## 4. Data

We use the Census Family and the Person files of the Survey of Labour and Income Dynamics (SLID) for the years 1996 to 2000. The SLID is conducted annually by Statistics Canada with a stratified random sampling of Canadians. With survey weights, the data are potentially nationally representative. There is evidence, however, that the SLID has under-sampling of low income families.<sup>15</sup> While this does not imperil our empirical strategy, it might limit the degree to which our results are nationally

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<sup>15</sup> Frenette, Green, and Picot (2004) show that low income families are under-represented in the SLID relative to administrative tax data and to Census data. While the weights correct for under-sampling by age, province, and sex, the weights are not adjusted for under-coverage by income group.

representative. The SLID provides detailed information on demographics, income and labour market activity at the individual level, as well as information on the family size and structure at the family level. The sample size per year is around 35 thousand census families made up of 60 thousand individuals aged 15 and higher. We select our sample based on the person files, merging in family characteristics from the family files. The focus of our analysis is mothers with children, so we keep females age 18 to 50.<sup>16</sup> Single women face a different employment decision than married women, so we exclude married women from our analysis.<sup>17</sup>

The benefit calculations are made using the observed income information on each woman, along with information on the province of residence, year, and number of children. Using a tax and benefit simulator, we calculate the child benefits owing to each woman under federal and provincial refundable tax credit programs. We use the output of the simulator to form the policy variables used in the study. Our primary policy variable of interest we call *NCBSCLAW*. It is calculated by multiplying the NCB Supplement payment owed to the family by a dummy variable for the five ‘clawback’ provinces that reduce social assistance by the amount of the NCB Supplement payments.

We form the instruments described earlier in the paper using the same tax simulator. After putting our sample of families through the simulator, we select those who had positive employment earnings and take the average value of the benefit variables

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<sup>16</sup> Those under 18 are typically not eligible for social assistance. Those over 50 have few children.

<sup>17</sup> Married women are much less likely to be on social assistance. In our sample, 4.2 per cent of married women have some social assistance income compared to 16.5 per cent of single women. Among women with children, 43.5 percent of single women are on social assistance while only 4.4 percent of married women are. Moreover, the husband’s income pushes most married women over the income threshold (\$25,921 in 1998) at which all NCB Supplement benefits are gone. In our simulated benefits, 74.7 percent of single mothers receive some NCB Supplement while only 17.8 percent of married mothers do.

by province-year and by province-year-child cells.<sup>18</sup> For the province-year cells, we exclude families without children from the calculation. For the province-year-children cells, we assign each family in the simulation 0 through 3 children in turn, so that we can get a benefit measure for the same set of families for all family sizes. The resulting benefits represent an exogenous measure of what benefits a working family could expect to receive given its province, year, and family size.

The outcomes we study in our analysis include four binary variables of labour market behaviour and five continuous measures of the intensity of work. We have a binary variable for any receipt of social assistance and one for having any earnings. These dummies are relatively blunt tools, as even a small amount of income will turn the outcome variable to a one. A more subtle measure is also provided in the SLID that indicates the ‘major’ source of income for the family.<sup>19</sup> We form a dummy for having government transfers as the major source of income, and a dummy for earnings as the major source of income. The continuous measures include earnings, social assistance income, total income, hours worked, and weeks worked. All of these are measured over the calendar year in question.

Table 1 shows our labour market dependent variables across different family sizes. Except for earnings, all measures of labour supply decrease monotonically with the number of children and the measures of social assistance increase monotonically with the number of children. Single women with children are large recipients of social assistance. More than half of single women with three or more children show some social assistance

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<sup>18</sup> We exclude families without positive earners because we want to measure the incentive to be in the labour force. The instrument would still work including all zero wage earners, but its predictive power would be reduced.

<sup>19</sup> The major source of income variable is provided by the SLID. Across several income categories (earned income, pensions, government transfers, etc.), the major source is defined as the category with the highest level of income.

income, and 55.7 percent of them have transfers as the major source of income. Still, more than 63 percent of them have some earnings in the year.

More descriptive statistics are provided in Table 2. The first column presents the means and standard deviations of many of our variables for the full sample of single women. The next three columns present the same statistics for subsamples of interest – mothers of children, major transfer recipients and those who are not major transfer recipients. The 34,018 women in the full sample receive, on average over all years, \$44.67 of integrated NCB benefits (*NCBSCLAW*). Looking just at mothers of children, the benefits are higher at \$213.75. Among those with positive values, the mean of *NCBSCLAW* is \$943.29. For major transfer recipients, *NCBSCLAW* is larger on average than for those who are not major transfer recipients.

Over 16 percent of women have positive social assistance income, rising to over 43 percent of single women with children. Correspondingly, *positive earnings* is higher for the full sample of women than for the subsample of mothers, at 0.817 compared to 0.703. Looking in the last two columns, it is clear that those who have transfers as their major source of income work much less than those who do not. The education levels of the different samples vary significantly. Transfer recipients are much more likely to be high school dropouts, at 31.3 percent versus 11.1 percent for those who are not major transfer recipients. Finally, major transfer recipients are more likely to have children, and those children are more likely to be young, than single women who are not major transfer recipients.

Table 3 provides further detail on our policy variables. We show the mean of four different policy variables for single mothers for each year and province in our sample. The upper left section of the table shows the values for *NCBSCLAW*. Newfoundland,

New Brunswick, Quebec, Saskatchewan, and British Columbia show zero in all years because these provinces do not directly reduce social assistance payments for child benefits received. The clawback provinces have the NCB Supplement introduced in July, 1998, and fully in place for 1999 and 2000. The observed differences across provinces partially reflect cross-provincial differences in characteristics such as income and number of children. Our IV strategy will discard these differences and focus on the policy variation. The discussion of the other policy variables is deferred until Section 6 when the results for those variables are presented.

## 5. Main Results

To begin our analysis of results, we generate graphs of some of our labour market outcome variables through time. We then report results for OLS regression that do not account for the mechanical endogeneity of benefits with work in order to motivate the need for our instrumental variables strategy. Next, we present results for *NCBSCLAW* using our IV strategy based on province-year cells, followed by a similar strategy that allows for variation in the number of children. Finally, we show the sensitivity of our results to several alternative sample selection criteria.

### Graphs of dependent variables through time

Figures 3 through 6 graph our binary outcomes variables for provinces that claw back the NCB Supplement from social assistance and for those that did not. Figure 3 shows the proportion of women with children having positive social assistance income. Before 1998, when there was no NCB Supplement, social assistance receipt was trending

downward in both sets of provinces, possibly reflecting improving national labour market conditions. After 1998, social assistance receipt in the clawback provinces drops below that seen in the no-clawback provinces, consistent with people moving from welfare to work following the NCB Supplement incentives.

Figure 4 repeats the analysis for the variable indicating positive earnings. There is less of a difference to be seen between the two lines over time, as both increase by more than 15 percentage points over this time period. Still, the gap between them does grow by 2000. In Figures 5 and 6, however, the results are much clearer. Figure 5 displays the graph for having government transfers as the major source of income. There is a clear drop in the clawback provinces from 45.6 percent in 1998 to 30.8 percent in 2000. The line for the no-clawback provinces, however, is flat. An equal and opposite reaction is seen for the variable indicating earnings as the major source of income. From 1998 to 2000, there was an increase of over 13 percentage points in the clawback provinces and almost no change in the no-clawback provinces.

The graphical analysis has provided some preliminary visual indication that a sharp change in employment and social assistance receipt may have occurred after 1998 in the clawback provinces, but not in the no-clawback provinces.<sup>20</sup> The regression analysis in the rest of this section aims to uncover stronger more convincing evidence of what can be seen in the figures, including controls for other policy interventions that may confound the inference.

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<sup>20</sup> In an online appendix available at <http://www.econ.ubc.ca/kevinmil/research/ncb.htm>, we have posted more detailed graphs of five subgroupings of provinces. The graphs show much stronger evidence of trend breaks in 1998-1999 for the clawback provinces than for the non-clawback provinces; especially for the 'major source' graphs corresponding to Figures 5 and 6.

## OLS Results

Our main regression results are reported in Table 4. We report the coefficient on *NCBSCLAW*, scaled in \$1,000s of dollars. This means that the estimated coefficient represents the predicted change in the outcome variable when \$1,000 more NCB Supplement is clawed back from social assistance. All reported standard errors are corrected by clustering on the level of aggregation of the benefit variable, which in some cases is province-year cells and for others is province-year-children cells.

The first column reports OLS regression results of the outcome variables on *NCBSCLAW* and the set of control variables for the sample of single mothers. For each regression, we only report the coefficient on the benefit variable. Since benefit levels first rise with earnings and then later fall for those with higher family income, the predicted sign for the estimated coefficients is unclear – those with zero benefits could be women who did not work at all or they could be women who earned very much and saw their benefits completely clawed back. Correspondingly, the estimated coefficients are hard to interpret. The estimated coefficient on social assistance receipt is 0.171, suggesting a 17.1 percentage point *increase* in receipt when benefits increase by \$1,000. Having positive earnings, however, is predicted to decrease by 8.9 percentage points. High earning women have their benefits completely clawed back because of their higher family income, so high earners tend to have no benefits. This mechanical endogeneity demonstrates the difficulties inherent in using observed in-work benefit amounts to study labour market behaviour.

## IV Results

To correct for this endogeneity, we turn to our first set of IV estimates in the second column. Here, we maintain our focus on women with children. As an instrument for

benefits, we use the simulated province-year cell mean of *NCBSCLAW*. This measure of benefits throws away any individual variation in family size or income and picks up only across-province, across-time variation in benefit levels. The first stage is a regression of *NCBSCLAW* on the province-year cell mean of simulated benefits. The first stage is very strong, with a \$1 increase in the cell mean benefits predicted to increase individual imputed benefits by \$0.920.<sup>21</sup> This suggests that there is sufficient province-year-children variation to provide identification.

The coefficients for the four measures of labour market participation all have the expected sign, and three are statistically significant. A \$1,000 increase in benefits leads to a 3.8 percentage point decrease in having positive social assistance income, although it is not statistically significant. The variable indicating transfers as the major income source is more responsive, with an estimated coefficient of -0.111. The mean of this variable is 0.432, so the estimated increase represents a 25.7 percent increase over the mean. The binary measures of earnings also show stronger results, with the indicator for positive earnings showing an increase of 3.3 percentage points. The variable for having earnings as the major income source is highly responsive, with a predicted increase of 7.5 percentage points. The mean of this variable in the sample of women with children is 0.502, so the estimate represents a 14.9 percent increase over the mean. The stronger results for the ‘major source’ variables indicate that most of the response comes from women with a little labour force attachment over the year who move to have greater labour force attachment, rather than from women with precisely zero attachment joining the labour force.

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<sup>21</sup> The *t*-statistic is 54.1, implying an *F*-statistic of 2928.7.

To put these estimates in context, consider a woman with one child contemplating the welfare or work decision. On welfare, assume that she would receive \$850 per month, or \$10,200 annually. If she worked at an \$8 per hour job for 40 hours per week for 52 weeks, she would earn \$16,640; an increment of \$6,440 over social assistance. A thousand dollar increase in *NCBSCLAW* would imply that the increment to income from choosing work would increase by 15.5 percent to \$7,440. Using our estimate for ‘earnings as a major source’ of 14.9 percent, the implied elasticity in this example is 0.96 (14.9 percent / 15.5 percent). In the US literature on the EITC, Hotz and Scholz (2003) conclude that the range of credibly estimated elasticities is between 0.69 and 1.16, so, our estimate lies comfortably in that range.

The continuous labour supply measures show a mixed response. The point estimate on earnings is quite high – suggesting that earnings increase by \$988 for a \$1,000 increase in integrated benefits, although the standard error is quite large. Total income, however, does not show a strong response. Finally, we estimate an increase in hours worked of 85.8 but no significant increase in weeks worked.

For social assistance, the estimated effect of making another thousand dollars subject to integration is a decrease of \$658. This result is composed of two effects. First, some families move from social assistance to work and therefore no longer collect any social assistance. Second, for those who stay on social assistance, the dollar-for-dollar claw-back of social assistance income also leads to a mechanical decrease in social assistance income when *NCBSCLAW* increases. Because not all women in the sample are on social assistance, we shouldn’t expect the dollar-for-dollar claw-back to result in a coefficient of  $-1,000.0$ .

In the third column we expand the sample to include single women without children. We form the instrument for this sample by using the same province-year cells as before, but now include benefits at zero for the childless families. Because the childless single women live in the same province and act in the same labour markets but do not receive any benefits, these women serve as a control for unobserved factors (such as labour market conditions or other policies) in each province-year location. We include dummies for having no children, as well as second order interactions of having no children with province and year effects. In such a specification, the policy effect is therefore identified by differences in labour supply *between* childless women and women with children in any given province-year combination.

For the binary labour market indicators, the point estimates are generally larger when we include the childless women in column (3). Welfare receipt is now predicted to decrease by 4.7 percentage points for a \$1,000 increase in integrated benefits. The positive earnings indicator is also statistically significant, with a point estimate of 4.6 percentage points.

The continuous measures of labour supply lie beneath. The estimated effect on earnings is still statistically insignificant, but the point estimate is now negative. This may indicate that the previous large positive estimate was simply picking up trends in earnings across provincial labour markets or some other unobserved factor. Social assistance income is still strongly negative, with an estimated average crowd out of \$704 for each \$1,000 in integrated benefits. Total income increases by about \$1,000 although the standard error is relatively large. The impact on hours work is not precisely estimated. Finally, in the fourth column of the table we use a more flexible instrument that allows for variation in the benefit corresponding to the number of children in the family. While

this contributes more identifying variation, it could be argued that the variation is not exogenous; that the number of children might respond to the benefits incentive. We examine this possibility later in this section. The point estimates in this column are very similar to the previous specification, but more precisely measured in most cases.

Using the estimated coefficient for social assistance receipt of -4.7 and -3.4 percentage points from columns (3) and (4), we can assess the magnitude of the contribution of the NCB Supplement integration to the overall downward trend in social assistance receipt. We take 1997 as the base year as it is the last full year before the NCB was introduced.<sup>22</sup> In the clawback provinces, social assistance take-up among single mothers declined from 49.9 percent to 33.0 percent in our sample between 1997 and 2000. The average value for *NCBSCLAW* in the clawback provinces increased from zero up to \$957.31 over the same time period. Therefore, the coefficient of -3.4 per thousand dollars from column (4) suggests that 3.3 points (which is 3.4 times \$957/\$1000) of the total decline of 16.9 points can be account for by the clawback of the NCB Supplement. This represents 19.4 percent of the trend. Repeating the calculation using the slightly higher coefficient of -0.047 from column (3) suggests that 26.5 percent of the trend can be explained by the integration of the NCB with social assistance. So, our estimates suggest that the integration of the NCB Supplement with provincial social assistance programs can account for between 19 and 27 percent of the decline in social assistance receipt among single mothers.

### Sample Sensitivity Checks

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<sup>22</sup> The calculation produces a similar result using 1996 as the base year.

To assess the sensitivity of our results to some of our assumptions, we present the results for alternative samples in Table 5. For the results in column (2), we identify a population that we might expect to have a larger response and see if it is so. Women with children under age six have much greater childcare demands than those of school-going age. For this reason, the responsiveness of mothers with young children may be limited. Restricting the sample to women with children at least 6 years old also helps as a robustness check against the possibility that fertility may be endogenous. Children aged six or more were born before the NCB policy was contemplated, so can be considered exogenous to the policy. Compared to the base results, the restricted sample has much larger coefficients. The coefficient on having positive social assistance income, for example, more than triples to -0.117.

In the third column, we try another restriction for a sample we think may be more responsive. Most women over age 24 will have completed their education, while a large proportion of women in their late teens are still potentially in school. By selecting a sample of women more active in the labour market, we expect to see a higher sensitivity to the incentives in the NCB. We find point estimates that are statistically indistinguishable from the base case, although they are uniformly larger. Taken together with the results in column 2, the results appear to vary sensibly in suitably chosen subsamples.

The final column of Table 5 shows the results excluding Quebec. Because Quebec has many different policies than the rest of the country, it is informative to check if the results depend particularly on the differences between Quebec and the rest of Canada. Although the results for having positive social assistance and positive earnings are

slightly less statistically significant, the balance of the results suggest that Quebec alone is not driving our results.

## 6. Results including other policy variables

Contemporaneous with the introduction of the NCB Supplement and the integration with social assistance payments, several provinces introduced new child benefit programs as well as other changes to social assistance. In addition, there were changes at the federal benefit level over our sample period. The impact of any of these policy changes on the labour market behaviour of single women is of interest on its own. However, it is of particular interest here because other policy changes may be confounding our findings for the integration of social assistance payments through the NCB program. In this section, we pursue analysis of all of the policy changes mentioned above.

The first additional policy variable we create is *WORKBENS*. This variable records the benefits of earned income credits that are available only to those who work. This includes the in-work benefits available in some provinces as part of the provincial component of the NCB program as well as the federal Working Income Supplement and the small Goods and Services Tax Credit. (More information on these programs is available in the Appendix.) We next compute a variable we call *AUTOBENS*. This variable accounts for benefits that are paid ‘automatically’ to families, even if they have no earnings. Included in this measure are several provincial benefits and the federal Canada Child Tax Credit. This measure also accounts for the NCB Supplement in the no claw-back provinces. The final policy variable we form is *PROVSA*. This variable measures the statutory level of social assistance benefits payable to the family if it were on social assistance. We gather the data on provincial social assistance from the National

Council on Welfare (2003). The available rates vary by province and by year, and as well between single families with no children and with children.

The province-year variation in these policy variables can be seen in Table 3. For *WORKBENS* in 1996 and 1997, the federal Working Income Supplement was in effect. The amounts vary in the table by province because of differing income levels – our instrumental variables strategy removes this income variation leaving no identifying information from the Working Income Supplement. For the last three years, residents of New Brunswick, Quebec, Ontario, Saskatchewan, Alberta, and British Columbia were eligible for earned income supplements.<sup>23</sup> For the automatic benefits, the policy variation comes from small provincial credits under the NCB program, as well as the introduction of the NCB Supplement for the no claw-back provinces. Quebec’s introduction of the Family Allowance in 1997 can also clearly be seen. Finally, statutory social assistance payments changed little over this period, with the observed within-province variation mostly reflecting differing price-indexation across provinces and differences in family composition across cells. Two exceptions are Saskatchewan, which lowered social assistance payments in 1998, and Quebec which lowered them between 1996 and 1997, as part of their reforms of child benefits.

In Table 6, we present evidence using the alternative benefit measures to gauge the importance of other provincially-varying benefits versus the NCB Supplement. In all cases we use the same specification as column (4) of Table 4, exploiting child, year, and provincial variation. For *WORKBENS* and *AUTOBENS* we use the same IV strategy as we used for *NCBSCLAW* to predict benefits, but for *PROVSA* we simply use the statutory benefit rates available to the family as the policy variable.

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<sup>23</sup> New Brunswick’s earned income credit was introduced in 1997 and Quebec’s in 1989 – both before the NCB. Details on all programs are provided in the Appendix.

The results in Table 6 use each of the policy variables in isolation, and then combine them together in the fifth column. The first column uses *NCBSCLAW* and so reproduces the results from the previous table. The second column uses *WORKBENS*. Higher provincial in-work benefits provide an incentive to work very similar to the EITC. The estimates are much less precise than for *NCBSCLAW*, meaning that it is difficult to find significant coefficients. This imprecision results from the limited size and variation of the benefits aggregated into *WORKBENS*. For both of the major source variables, *WORKBENS* shows a very strong and statistically significant response. However, this may be simply picking up the impact of other policy variables that are correlated with *WORKBENS* – a possibility we check below.

The third column uses the *AUTOBENS* variable. Because receiving more benefits not conditional on earnings decreases the incentive to work, we expect to find opposite signs than we found for the first two columns. The results do show the expected sign pattern, with both of the ‘major source’ variables showing strongly significant coefficients.

The effect of provincial social assistance rates is estimated to be strong and positive for having any social assistance income. However, the other three point estimates are uniformly close to zero, although imprecisely estimated. The lack of strong variation in provincial social assistance rates over this period may contribute to these weak findings.

The final column puts all four policy variables in the same regression. Importantly, this allows us to check whether the inferences for *NCBSCLAW* have been confounded by the other social assistance and child benefit reforms ongoing during this period. For three of the four dependent variables, the point estimate and significance level for *NCBSCLAW* is stronger in column (4) than in column (1), suggesting that other provincial programs

omitted from the regressions are not driving what we saw in the main results. The estimates for *AUTOBENS* and *PROVSA* are significant for having any social assistance income, but insignificant for the other three dependent variables. The only variable with a systematic relationship across the different dependent variables is *NCBSCLAW*.

From this evidence we draw two conclusions; one strong and one more tentative. The stronger conclusion is that our main results on the impact of the integration of NCB benefits with social assistance are not driven by these other policies. The more tentative conclusion is that integration is a more effective policy than earned income credits or lower social assistance payments in increasing work among single females. While some of the point estimates for *WORKBENS* are large, the imprecision of the estimates renders it difficult to make any definitive conclusion.

One potential explanation for the stronger effect of the NCB clawback compared to earned income credits is that the NCB Supplement is directly subtracted from the recipients' monthly social assistance cheque. Recipients are therefore made well aware that they must work to receive additional benefits. On the other hand, the provincial programs are often administered separately, or through tax returns, and while the incentive structure may be similar, recipients may not be as aware of potential work incentives and crowd-out effects. Previous work has documented the relationship between take-up and the visibility of the program (Currie, 2004). In the case of the NCB individuals need not apply separately for the federal and provincial programs, and as such differential take-up is not driving differences here. However, the transparency of the mechanisms by which the programs promote workforce participation does differ and transparency arguments may indeed explain part of the differential effects on labour supply. It may also be that the NCB documentation provided to recipients made it

abundantly clear that recipients would not lose benefits through working.<sup>24</sup> However, we can not directly test these explanations.

## 7. Conclusions

In this paper, we study the introduction of the National Child Benefit program in Canada in 1998. Because some provinces chose to subtract the benefits from their social assistance programs and some did not, cross-province variation in the incentives to leave social assistance were introduced. We exploit these differences and find a large, statistically and economically significant effect on social assistance take-up and work. The magnitude of the effects we estimate are within the range of those found in the EITC literature in the United States. Our estimates suggest that between 19 to 27 percent of the total decline in social assistance receipt among single mothers can be accounted for by the integration of social assistance payments with the NCB supplement.

Saez (2002) stresses the importance of differentiating between the extensive and the intensive elasticities when evaluating labour market incentives. His optimal tax model recommends a benefit with a smaller transfer and an earnings exemption before receiving any benefit when the extensive elasticity is large, and a benefit with larger transfers and clawbacks starting at very low incomes when the extensive elasticity is less responsive. In the context of this model, the large extensive elasticities that we estimate may provide some justification for the integration of benefits under the NCB, as the integration effectively acts as an earnings exemption, with benefits received only by those who are working. As this is a feature of the NCB found neither in the EITC in the United States

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<sup>24</sup> We thank a referee for making this point.

nor the WFTC in the United Kingdom, the experience in Canada can help inform policy aimed at targeting support in other jurisdictions.

## Appendix – Details on Child Benefits

Below we provide details on the federal and provincial child benefits we include in our tax calculator. The discussion is split between the in-work benefits and the automatic benefits. Unless otherwise stated, the description applies to the year 2000. In all cases, the family income measure used to reduce benefits is from line 236 of the federal tax form, which is net family income (total income less deductions).

### In-work Benefits

Below we describe some details of the provincial in-work benefits available in certain provinces. With the exception of New Brunswick and Quebec, all of the programs were introduced in 1998. The income used for the phase-in is a measure of earned income, and income for the benefit reduction is the “line 236” net family income measure from the federal tax form.

#### *Federal Goods and Services Tax Supplement: 1991*

A credit of \$106 is phased in at a rate of 2 percent for income over \$6,546. Only childless single adults are eligible. It is reduced along with the Goods and Services Tax Credit at a rate of 5 percent for income over \$26,284.

#### *Federal Working Income Supplement: 1993*

This credit paid benefits of \$500 until 1996 and \$605, \$405, and \$330 for one, two and three children in 1997. It was phased in at a rate of 8 per cent for income higher than \$3,750, and reduced at a rate of 10 percent for family income over \$20,921. It was cancelled in 1998.

#### *New Brunswick Working Income Supplement: 1997*

For each dollar of earned income over \$3,750, a family with children receives 4 cents more Working Income Supplement up to a maximum of \$250. Family income over \$20,921 reduces the Supplement by 5 cents until it is completely gone.

#### *Quebec Parental Wage Assistance: 1989*

This program pre-dates the NCB initiative by a number of years. For 1999-2000, single families received 35 cents for every dollar earned over \$1,200 per month, and then reduced by 43 cents for every dollar of income over \$7,790 per month for singles and \$11,370 per month for couples.

#### *Ontario Child Care Supplement for Working Families: 1998*

Benefits increase with earned income over \$5,000 by 21 cents per dollar for one child under age 7, 42 cents for two children under 7, and 63 cents for three or more children

under 7. The maximum benefit is \$1,100 for single families and \$1,310 for married families. For income greater than \$20,000, the benefit is decreased by 8 cents per dollar of family income.

*Saskatchewan Employment Supplement: 1998*

The benefit is zero until \$1,500 of earned income. For earnings greater than \$1,500, the benefits are increased by 25 to 45 cents per dollar, depending on the number of children. The maximum benefit is \$2,100 for the first child, plus \$420 for each additional child. The income threshold is \$12,900 and the reduction rate is 25 cents per dollar of earnings over the threshold.

*Alberta Family Employment Tax Credit: 1998*

The benefit pays up to \$500 to families with one child and up to \$1000 for families with two children. The benefit starts when earned income reaches \$6,500 and rise by 8 cents per dollar of income over the threshold. They begin to be reduced at \$25,000 at a rate of 4 cents per dollar.

*British Columbia Earned Income Benefit: 1998*

The benefit pays up to \$605 for the first child, \$405 for the second, and \$330 for the third and fourth child. The benefit is clawed in between \$3,750 and \$10,000 at the rate necessary to ensure the maximum benefit is reached at \$10,000. The benefit is reduced for income over \$20,921 at 12.1% for one child, 20.2% for two children, and 26.8% for three children.

## Automatic Benefits

*Federal Goods and Services Tax Credit*

The benefit pays \$202 per adult and \$106 per child. It is reduced with family income at a rate of 5 percent in excess of \$26,284.

*Federal Canada Child Tax Benefit*

The benefit pays up to \$1,104 per child. It is reduced with family income at a rate of 2.5 percent for one child and 5 percent for two or more children for family income in excess of \$26,284.

*Newfoundland and Labrador Child Benefit: 1999*

The benefit pays \$204 for one child, an additional \$312 for a second child, \$336 for the third child, and \$360 for a fourth or subsequent child. It is reduced by family income in excess of \$15,921 until the income level of \$20,921 when it is exhausted. This benefit was introduced along with a social assistance reform that reduced rates.

*Nova Scotia Child Benefit: 1998*

The benefit pays \$403 for one child, an additional \$319 for a second child, and \$286 for a third or subsequent child. It is reduced with family income in excess of \$16,000 until the income level of \$20,921 when it is exhausted.

*New Brunswick Child Tax Benefit: 1997*

The benefit pays \$250 per child. It is reduced at a rate of 2.5 percent for one child or 5 percent for two or more children for family incomes in excess of \$20,000.

*Quebec Family Allowance: 1997*

The benefit initially paid \$975 per child in 1997, with an extra \$1,300 for the first child of a single-parent family. It is reduced with family income in two tiers. First, at a rate of 25 percent (35% for singles with one child) until a minimum benefit level is reached. Following that, it is reduced at a rate of 5 percent for incomes higher than \$50,000. This benefit was decreased to \$625 per child by 2000. This benefit was introduced at the same time as changes to social assistance rates.

*Saskatchewan Child Benefit: 1998*

The benefit pays \$720 for one child, an additional \$924 for a second child, and \$996 for a third or subsequent child. It is reduced with family income in excess of \$15,921 at rates between 15 percent and 60.6 percent, depending on the number of children. This benefit was decreased each time the NCB Supplement was increased. Changes to social assistance rates were introduced at the same time as this benefit was introduced.

*British Columbia Family Bonus: 1996*

Each child entitles the parent to \$1,332 per year, from which the National Child Benefit Supplement amount is subtracted. The Bonus is reduced with family income in excess of \$18,000 at a rate of 8 percent for families with one child and 16 percent for families with two or more children. Provincial social assistance rates were reformed at the time the BC Family Bonus was introduced.

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Figure 1: NCB Supplement benefit rates for 1998

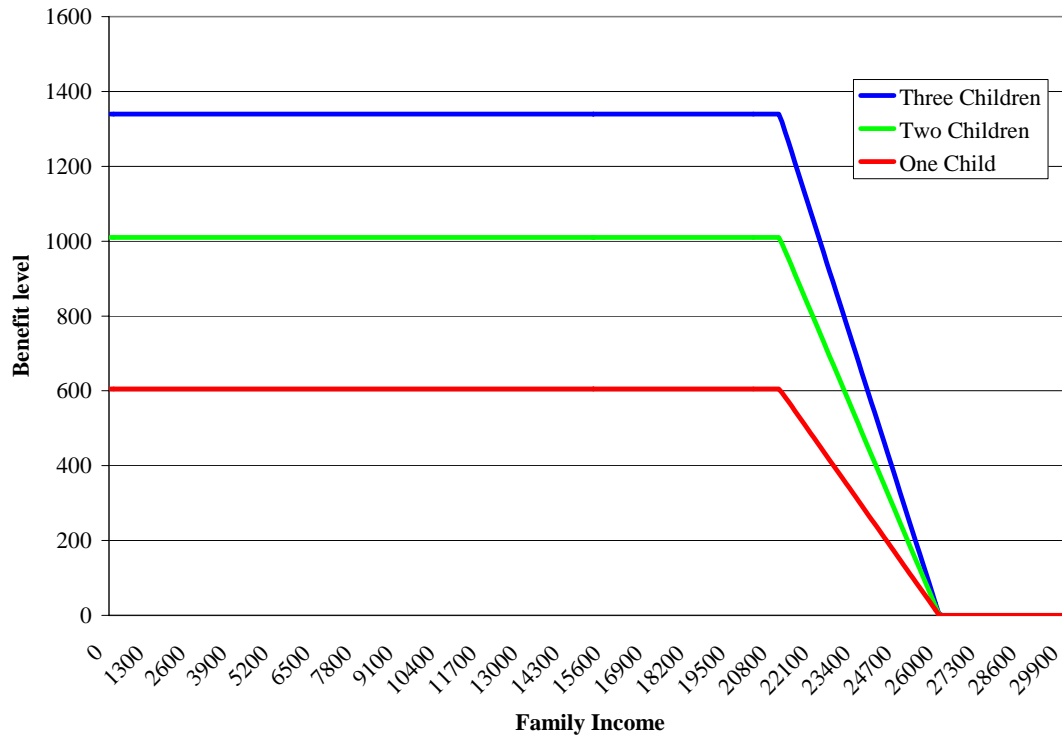


Figure 2: Static Labour Supply

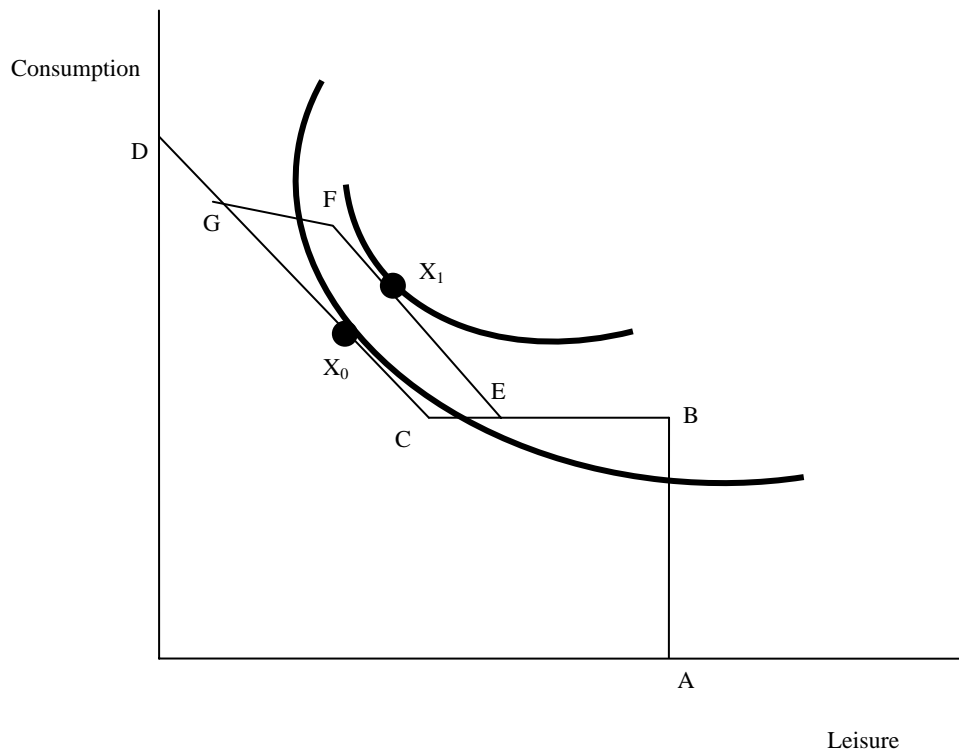


Figure 3: Social Assistance Receipt

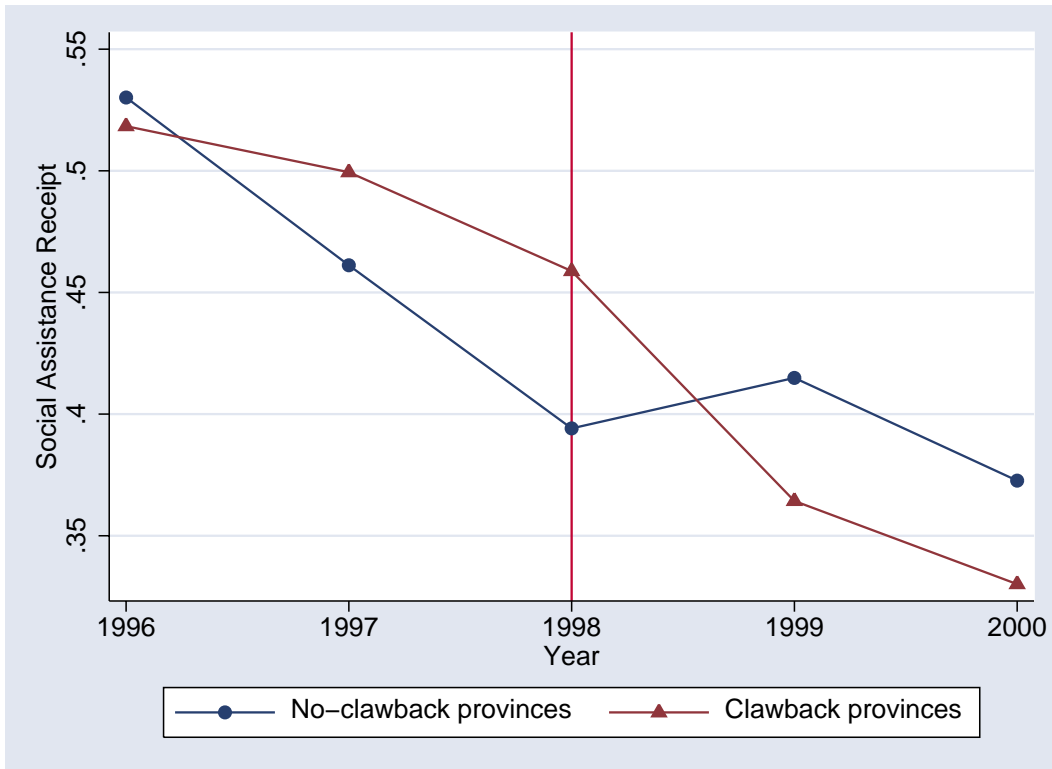


Figure 4: Positive Earnings

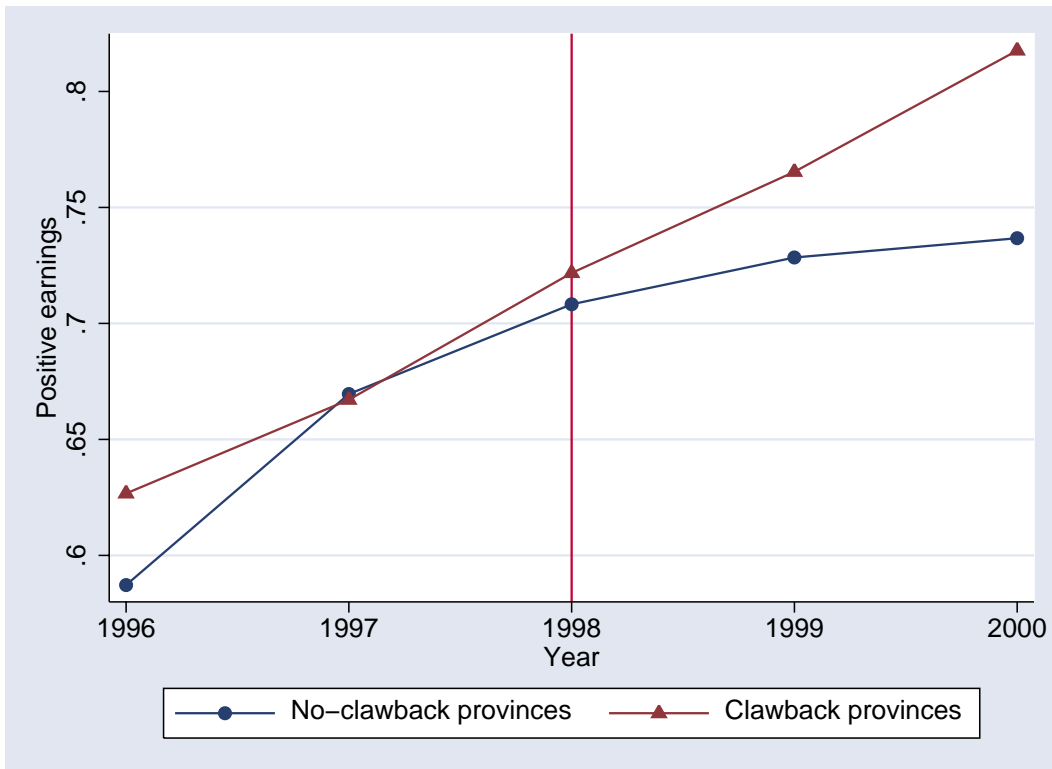


Figure 5: Transfers are Major Income Source

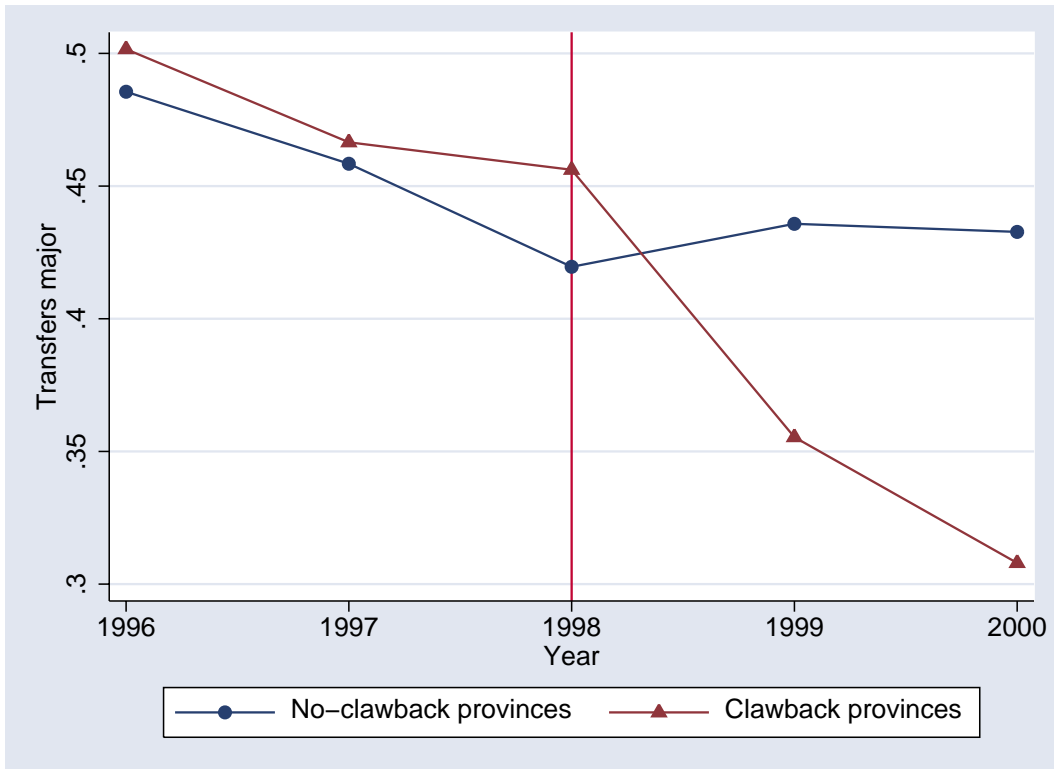


Figure 6: Earnings are Major Income Source

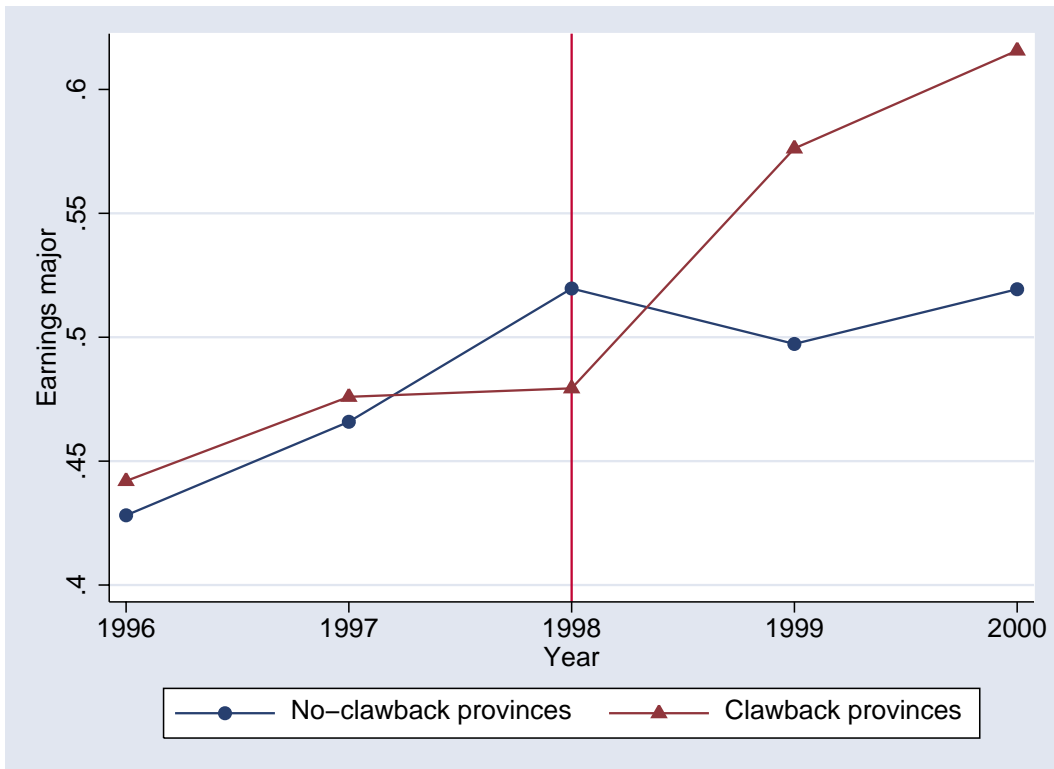


Table 1: Dependent Variables By Number of Children

	All single women	Zero children	One child	Two children	Three children
observations	34018	25994	4447	2682	895
Positive social assistance	0.165	0.094	0.403	0.460	0.520
Transfers major source	0.200	0.138	0.384	0.471	0.557
Positive earnings	0.817	0.847	0.737	0.670	0.635
Earnings major source	0.716	0.772	0.560	0.452	0.364
Weeks worked	35.8 (21.9)	36.8 (21.3)	34.1 (23.4)	30.8 (24.2)	26.3 (24.4)
Hours worked	1139.2 (900.4)	1158.7 (887.3)	1137.1 (944.7)	1018.4 (941.1)	853.6 (914.7)
Earnings	16396.4 (18629.7)	16546.6 (18818.4)	17088.2 (18259.0)	14775.7 (17248.7)	12803.0 (17358.7)
Social assistance	1196.1 (3173.1)	587.9 (2163.2)	2905.0 (4329.9)	3927.9 (5080.2)	5113.2 (6111.1)
Total income	19972.6 (18290.0)	18511.8 (18673.5)	24579.0 (16021.7)	26187.1 (15165.9)	27964.4 (14042.0)

Notes: All dollar values in 2000 Canadian dollars. Standard deviations are beneath continuous variables.

Table 2: Descriptive Statistics

	All single women	Single women with children	Major transfer recipients	Not major transfer recipients
observations	34018	8024	7272	26746
<i>NCBSCLAW</i>	44.67 (243.43)	213.75 (497.42)	126.78 (415.29)	24.19 (170.06)
Positive social assistance	0.165	0.435	0.683	0.036
Positive earnings	0.817	0.703	0.279	0.951
Age	30.0 (9.7)	35.6 (7.6)	32.2 (9.4)	29.5 (9.7)
Education - dropout	0.151	0.200	0.313	0.111
Education - secondary graduate	0.134	0.159	0.148	0.131
Education - some post secondary	0.564	0.552	0.494	0.582
Education - university graduate	0.151	0.089	0.045	0.177
Number of children	0.332	1.589	0.770	0.223
Child under age 6	0.074	0.352	0.218	0.037

Notes: All dollar values in 2000 Canadian dollars. Standard deviations are beneath continuous variables.

Table 3: Policy Variation By Year and Province

	1996	1997	1998	1999	2000		1996	1997	1998	1999	2000
<i>Average value of NCBSCLAW</i>						<i>Average value of WORKBENS</i>					
Newfoundland	0	0	0	0	0	Newfoundland	67	88	0	0	0
Prince Edward Island	0	0	313	882	1137	Prince Edward Island	180	227	0	0	0
Nova Scotia	0	0	397	992	1183	Nova Scotia	114	107	0	0	0
New Brunswick	0	0	0	0	0	New Brunswick	97	198	74	63	86
Quebec	0	0	0	0	0	Quebec	348	382	237	269	204
Ontario	0	0	304	797	945	Ontario	80	139	159	248	241
Manitoba	0	0	346	1027	1112	Manitoba	162	226	0	0	0
Saskatchewan	0	0	0	0	0	Saskatchewan	175	269	787	772	668
Alberta	0	0	289	695	862	Alberta	193	257	278	337	243
British Columbia	0	0	0	0	0	British Columbia	124	151	232	288	236
<i>Average value of AUTOBENS</i>						<i>Average value of PROVSA</i>					
Newfoundland	1900	1912	2227	2801	3678	Newfoundland	11271	11373	11449	11508	11607
Prince Edward Island	1896	2032	1977	2072	2117	Prince Edward Island	10250	9984	9680	9282	9599
Nova Scotia	2214	2222	2285	2508	2663	Nova Scotia	10568	10571	10394	10158	10047
New Brunswick	1946	2018	2444	2992	3382	New Brunswick	9580	9851	9934	9930	9926
Quebec	2280	2876	4346	4605	4537	Quebec	11537	11104	10835	10547	10295
Ontario	2067	1962	1974	2002	2063	Ontario	11949	11976	11670	11277	11097
Manitoba	1902	2021	1989	2433	2246	Manitoba	9644	9647	9344	8946	8975
Saskatchewan	2234	2267	2956	4195	4336	Saskatchewan	10389	10393	9298	9488	9458
Alberta	2139	2086	1992	1954	1954	Alberta	9198	9278	9194	9084	8972
British Columbia	2975	3801	3293	3779	3830	British Columbia	11973	11928	11624	11237	11161

Notes: All dollar values in 2000 Canadian dollars. Sample includes all single mothers of children.

Table 4: Main Regression Results

	(1)	(2)	(3)	(4)
	OLS	IV	IV	IV
sample	single mothers	single mothers	all single women	all single women
Instrument variation	--	Prov-year	Prov-year- has children	Prov-year- number children
observations	8024	8024	34018	34018
First stage	--	0.920 *** (0.017)	0.913 *** (0.009)	0.915 *** (0.008)
Positive SA	0.171 *** (0.016)	-0.038 (0.025)	-0.047 * (0.025)	-0.034 ** (0.016)
Transfers major source	0.167 *** (0.016)	-0.111 *** (0.019)	-0.118 *** (0.016)	-0.110 *** (0.017)
Positive earnings	-0.089 *** (0.016)	0.033 * (0.019)	0.046 ** (0.021)	0.046 ** (0.020)
Earnings major source	-0.216 *** (0.016)	0.075 *** (0.019)	0.071 *** (0.018)	0.070 *** (0.016)
Earnings	-12052.9 *** (584.9)	987.6 ** (490.4)	-229.9 (451.2)	391.1 (529.8)
Social assistance	1445.2 *** (184.4)	-657.9 ** (292.5)	-703.5 ** (275.0)	-680.7 *** (205.4)
Total Income	-9799.1 *** (546.6)	87.2 (357.6)	1007.4 ** (498.4)	810.6 * (473.8)
Weeks worked	-7.1 *** (0.8)	1.6 (1.0)	1.6 (0.8)	1.1 (0.9)
Hours worked	-327.4 *** (31.8)	85.8 ** (37.3)	42.1 (31.2)	61.8 * (32.5)

Notes: Reported is the coefficient on *NCBSCLAW* scaled in thousands of 2000 Canadian dollars. One, two, and three asterisks indicate statistical significance at the 10, 5, and 1 percent levels respectively. All specifications include dummies for year, province, number of children, age of woman, education level, and presence of a child under age 6. In the third column there are second-order interactions between province, year, and presence of children dummies. In the fourth column there are second-order interactions between province, year, and number of children dummies.

Table 5: Sensitivity Regression Results

	(1)		(2)		(3)		(4)	
	Base results		Exclude mothers of children under 6		Just women over age 24		Exclude Quebec	
observations	34018		31314		19280		27553	
First stage	0.915	***	0.791	***	0.896	***	0.919	***
	(0.008)		(0.008)		(0.011)		(0.011)	
Positive social assistance	-0.034	**	-0.117	***	-0.046	***	-0.036	*
	(0.016)		(0.030)		(0.016)		(0.021)	
Transfers major source	-0.110	***	-0.179	***	-0.145	***	-0.098	***
	(0.017)		(0.035)		(0.021)		(0.024)	
Positive earnings	0.046	**	0.104	**	0.075	***	0.035	
	(0.020)		(0.035)		(0.020)		(0.023)	
Earnings major source	0.070	***	0.132	***	0.101	***	0.054	**
	(0.016)		(0.037)		(0.020)		(0.021)	

Notes: Reported is the coefficient on *NCBSCLAW* reported in thousands of 2000 Canadian dollars. One, two, and three asterisks indicate statistical significance at the 10, 5, and 1 percent level respectively. All specifications include dummies for year, province, number of children, age of woman, education level, and presence of a child under age 6. There are second-order interactions between province, year, and family size dummies.

Table 6: Regressions Including Other Benefits

	(1)	(2)	(3)	(4)	(5)
	<i>NCBSCLAW</i>	<i>WORKBENS</i>	<i>AUTOBENS</i>	<i>PROVSA</i>	<i>ALL</i>
observations	34018	34018	34018	34018	34018
Positive social assistance					
<i>NCBSCLAW</i>	-0.034 ** (0.016)	--	--	--	-0.072 *** (0.021)
<i>WORKBENS</i>	--	-0.037 (0.066)	--	--	-0.113 (0.074)
<i>AUTOBENS</i>	--	--	-0.001 (0.007)	--	-0.026 ** (0.011)
<i>PROVSA</i>	--	--	--	0.041 *** (0.014)	0.038 *** (0.013)
Transfers major source					
<i>NCBSCLAW</i>	-0.110 *** (0.017)	--	--	--	-0.096 *** (0.027)
<i>WORKBENS</i>	--	-0.291 *** (0.076)	--	--	-0.145 * (0.084)
<i>AUTOBENS</i>	--	--	0.041 *** (0.009)	--	0.001 (0.017)
<i>PROVSA</i>	--	--	--	-0.008 (0.018)	0.028 (0.017)
Earnings positive					
<i>NCBSCLAW</i>	0.046 ** (0.020)	--	--	--	0.057 ** (0.028)
<i>WORKBENS</i>	--	-0.010 (0.082)	--	--	-0.091 (0.110)
<i>AUTOBENS</i>	--	--	-0.011 (0.009)	--	-0.001 (0.015)
<i>PROVSA</i>	--	--	--	0.001 (0.016)	-0.014 (0.018)
Earnings major source					
<i>NCBSCLAW</i>	0.070 *** (0.016)	--	--	--	0.077 *** (0.026)
<i>WORKBENS</i>	--	0.144 *** (0.052)	--	--	0.082 (0.067)
<i>AUTOBENS</i>	--	--	-0.021 *** (0.007)	--	0.008 (0.014)
<i>PROVSA</i>	--	--	--	0.004 (0.013)	-0.005 (0.014)

Notes: Reported are the coefficients on the noted policy variables, scaled in thousands of 2000 Canadian dollars. One, two, and three asterisks indicate statistical significance at the 10, 5, and 1 percent level respectively. The control variables are the same as in Table 4, column 4. *NCBSCLAW*, *WORKBENS*, and *AUTOBENS* are instrumented using the set of policy instruments.