

New Reform Strategies and Welfare Participation in Canada

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Abstract: *This paper attempts to measure reductions in Canadian welfare participation associated with novel and aggressive policy tools implemented in some provinces: work requirements, diversion, earning exemptions, and time limits, referred to here as new reform strategies. Controlling for province-specific benefit levels, eligibility requirements, GDP growth, labor market conditions and demographic composition, the empirical models suggest that welfare participation declines 24 percent in provinces that adopt strong sanctions penalizing participants who fail to satisfy work requirements -- two-and-a-half times more than in provinces with weak sanctions. Adoption of new reform strategies explains at least 10 percent of observed declines in welfare participation from 1994 to 2005 using the most conservative empirical models and substantially more under alternate specifications.*

Keywords: Social Assistance, PRWORA, TANF, Work Requirements, Diversion, Earnings Exemptions, Time Limits, Natural Experiments

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NEW REFORM STRATEGIES AND WELFARE PARTICIPATION IN CANADA

1. INTRODUCTION

During the 1990s and 2000s, Canada's welfare system¹ transitioned from a relatively centralized program with federal administrative controls to a decentralized mix of programs in which provinces had considerable discretion to undertake new policies. Province-specific policy transitions generated substantial heterogeneity in both the composition and timing of changes aimed at reducing the number of welfare recipients. Passage of The Canada Health and Social Transfer (CHST) in 1996 implemented block-grant funding and removed most federal rules restricting how provinces managed their welfare systems, which was a major event in the decentralization process. Policy transitions in the provinces did not, however, uniformly coincide with CHST in 1996, nor were they uniform in content and stringency of implementation.² While some provinces aggressively experimented with new policy tools aimed at reducing welfare participation, nearly all reduced welfare benefit levels and tightened eligibility requirements, which are referred to in this paper as *standard tools* of welfare reform.

¹ *Welfare* refers to government programs that provide cash benefits to individuals with low incomes. In Canada, welfare is referred to as *social assistance*.

² A key aspect of CHST that distinguishes the extent of decentralization in Canada from that of the U.S. is the absence of new federal mandates in Canada. The U.S.'s Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) required a specific set of new policies for all states: five-year time limits on welfare participation and the requirement of work activity for a minimum proportion of each state's welfare clients. Federal law also partially restricted US states from lowering benefit levels. In contrast, decentralization of Canada's welfare system had no federal mandates aimed explicitly at reducing welfare participation or incentivizing work. Thus, while states were given discretion in other policy areas such as earnings exemptions and diversion strategies, federally mandated work-participation requirements led to relatively similar sets of policy changes going into effect across the 50 states shortly after passage of PRWORA in 1996. Federal limits on cuts in benefit levels in the U.S., once again, implies more uniformity among states than among provinces. These two layers of federal control guiding welfare reform in the U.S., which were not part of Canada's decentralized reforms, suggest at least the possibility that the most stringent among the new reform strategies adopted by provinces could have exceeded, in stringency, those that took place in most states. For example, British Columbia adopted reforms comparable to PRWORA and cut benefit levels. This contrasts with the by-and-large valid generalization that Canada's welfare reforms were, on the whole, less stringent than the U.S.'s. From a statistical point of view, the main point here is that decentralization in Canada severed province-level from federal policy to a greater extent than in the U.S., stringency notwithstanding, which generated substantial variation that has yet to be fully coded in econometric studies of welfare participation.

The phrase *standard tools* is introduced to distinguish benefit levels and eligibility requirements, which have been studied extensively, from less frequently studied policy tools that are the focus of this paper: work requirements, diversion, earning exemptions, and time limits (described in more detail in subsequent sections), which are referred to jointly in this paper as *new reform strategies*. Several provinces aggressively implemented different combinations of these new reform strategies, although at different times. Others did not. Provinces' heterogeneous adoption decisions and adoption dates also overlapped in different ways with benefit reductions and tightening of eligibility requirements, further obscuring the effects on welfare participation rates attributable to new reform strategies and their stringency of enforcement.

Canada's welfare participation rate began to decline in 1994, two years prior to passage of the CHST. Following passage of the CHST, welfare participation continued to decline and remained substantially lower for a sustained period, raising the question: What role, if any, did new reform strategies play in the observed decline in Canada's welfare participation rate?

This paper attempts to address this question by measuring disaggregated effects of the new reform strategies on provinces' welfare participation rates, while controlling for changes in province-specific benefit levels, eligibility requirements, GDP growth, labor market conditions and demographic composition. Heterogeneity of provinces' adoption decisions and adoption dates that resulted from decentralization of Canada's social assistance program can be considered as a collection of natural experiments providing valuable statistical information with which to measure the effects of new reform strategies, above and beyond the effects of benefit levels and eligibility requirements.

Benefit levels and eligibility requirements have been studied extensively. Allen (1993) uses micro-data to show that differences in benefit levels and asset exemption levels among

provinces have statistically and economically significant effects on welfare participation.

Dooley's (1999) longitudinal micro-data study of single mothers similarly finds that benefit levels relative to labor market wages (controlling for age and family structure) explain a large share of variation in welfare participation decisions among this important subpopulation.

Christofides, Stengos and Swidinsky (1997) and Christofides (2000), however, argue that changes in wages and personal characteristics may be more important than changes in benefit levels and shifts in other institutional variables that characterize welfare programs. Klassen and Buchanan (1997) focus on eligibility requirements and find that labor market conditions more powerfully influence welfare participation rates.³

Compared to the substantial literature focused on benefit levels and eligibility requirements, few studies have attempted to disaggregate the four new reform strategies as implemented in Canada and measure their effects relative to benefit levels and eligibility requirements. One reason is that the very heterogeneity that makes new reform strategies potentially rich with relevant statistical information also presents a formidable challenge in coding heterogeneous laws, enforcement practices, and timing profiles into policy variables that can be operationalized within a standard econometric model. This paper attempts to address that challenge. In their micro-data study of the effects of unemployment benefits and social assistance benefits on individual entry and exit decisions, Finnie and Irvine (2008) provide a useful discussion of the potentially important role that new reform strategies might have played in influencing welfare participation rates. In their econometric strategy, they attempt to control for this confounding source of unobserved variation using year fixed effects. The intent of this paper is to complement that approach by utilizing additional sources of information about

³ An overlapping set of questions about the determinants of welfare participation have been extensively investigated using US data (e.g., Blank, 2001, 2002; Acs, Phillips and Nelsen, 2005; Ribar, 2005).

provinces' adoption decisions, timing, and stringency of enforcement, concerning the four new reform strategies.

Using a more aggregated policy measure than ours, Kneebone and White (2009) capture an important aspect of what we are seeking to measure (i.e., the effect of new reform strategies relative to the standard policy tools of benefit levels and eligibility requirements). They introduce a variable that they refer to as “administrative procedures,” an indicator that “turns on” from 0 to 1 for province-years in which strong administrative procedures for reducing welfare participation were in effect, which turns out to consist solely of Alberta (1993-2003), British Columbia and Ontario (1996-2003).⁴ We undertake to implement a more disaggregated coding methodology that maps a substantial body of source material (published by provincial governments and third-party analyses of stringency of enforcement in different province-years) into policy variables measuring the presence of new reform strategies. Coding this additional information enables the empirical models in this paper to quantify which among multiple policy mechanisms (that researchers studying U.S. welfare reforms have focused on) were most strongly associated with observed declines in the provinces' welfare participation rates.

The empirical models presented here use data covering the 20-year period from 1986 to 2005, described in detail below, with the “province-year” as the unit of observation.⁵ This contrasts with Kneebone and White (2009), whose estimates use 15 years of data ranging from 1989 to 2003. By incorporating the years 2004-2005, the estimates reported in this paper more

⁴ Shannon (2009) coded provinces into categories that distinguish aggressive versus non-aggressive reforms, but in the context of explaining labor supply decisions. See also Green and Warburton (2004), who examine the effects of diversion strategies in BC on long-run welfare participation.

⁵At the time of writing, Canada’s National Council of Welfare had published welfare participation counts broken out by province only through 2005. Another reason for making 2005 the end-point of the time horizon for data analysis is to avoid dealing with the potentially confounding effect of the split (which occurred around this time) of the CHST into the Canada Health Transfer (CHT) and the Canada Social Transfer (CST).

fully reflect British Columbia's aggressive implementation of new reform strategies in 2002, as well as those adopted by Nova Scotia's and, to a lesser extent, Saskatchewan, in 2001.

Table 1 summarizes new reform strategies adopted in the provinces since 1986. Documents released by provincial welfare agencies and numerous other sources guided the taxonomy laid out in Table 1 for classifying new reform strategies into work requirements with strong sanctions for non-compliance, work requirements with weak sanctions, strong diversion of would-be welfare recipients into alternative sources of support, weak diversion, earnings exemptions⁶ to encourage work, and time limits that cap the duration for which recipients can receive benefits.⁷ According to Table 1, most provinces pursued some type of new reform strategy, although the stringency of sanctions used to enforce work requirements and of diversion varied in important ways, as recorded in the column headings distinguishing *weak* from *strong* versions of work requirements and diversion.⁸

The paper proceeds as follows. Section 2 describes Canadian welfare participation rates at the national and provincial levels and documents differences in benefit levels and eligibility requirements, income growth and unemployment rates, and adoption of new reform strategies across provinces and through time. These groups of variables serve as three competing categories of information to explain observed reductions in welfare use that took place from 1994 through 2005. Section 3 presents summary statistics and models used to estimate the

⁶ In the models introduced subsequently, three variables code the variation in earning exemptions across province years: the earning exemption threshold, the tax back rate on earnings above this threshold, and an interaction term.

⁷ Note that the adjective “new” is slightly misleading in the case of earnings exemptions since some provinces experimented with them decades earlier. Even in the beginning year of our sample, virtually all provinces had some form of earnings exemptions in place allowing welfare recipients who earned labor income to keep a non-zero fraction of labor market earnings. One reason for classifying earnings exemptions as “new reform strategies” is because some provinces used them more aggressively during the 1986-2005 period. Prior to passage of PRWORA in 1996, labor market earnings of long-term welfare participants in the U.S. were taxed at 100 percent, generating a potentially strong disincentive to work. In the US context, earnings exemptions can indeed be regarded as one of the important new reform strategies put forward by advocates of welfare reform.

⁸ Source material and the method in which *Weak* versus *Strong* designations were coded are discussed in the following section. Appendix A presents additional detail.

effects of these three groups of explanatory variables on welfare participation. Section 4 presents empirical results based on finely disaggregated specification using a multi-dimensional set of variables to code information collected from ministerial sources summarized in Table 1 about changes in new reform strategies. The robustness of the new information revealed by the disaggregated multi-dimensional representation is investigated by comparing findings with a simpler specification using a single variable to code variation in the presence of new reform strategies. The findings in Section 4 are intended to address the question posed earlier by measuring the effects of new reform strategies relative to other factors thought to influence welfare participation. Section 5 concludes with discussion and interpretations of the empirical findings.

2. DECLINING WELFARE PARTICIPATION AND CONCURRENT POLICY CHANGE

Welfare Participation in Canadian Provinces

Figure 1 disaggregates welfare participation into time paths for Alberta, British Columbia, Ontario, and an aggregate of other provinces (weighted by population). The time paths in Figure 1 vary considerably both in level and trend.⁹ Welfare participation peaks in all provinces between 1993 and 1997. Subsequent declines are nearly monotonic, although levels and rates of decline are markedly different. For example, Figure 1 shows a significant decline in welfare participation in British Columbia since 2002 not observed in other provinces.¹⁰

Table 2 computes changes in levels (in units of percentage points) and percentage declines in welfare participation rates, by province, from 1994 (the year in which Canada's

⁹ Based on data from the National Council of Welfare (2003, 2006), welfare participation rates are computed annually as the fraction in each province of the non-elderly population (those strictly under the age of 65) receiving welfare in March of a given year.

¹⁰ In general, the rate of welfare participation is higher in Canada than in the US. In part, this is because adults with no children are eligible for benefits in Canada, while only families with dependent children are eligible in the U.S.

national rate of welfare participation peaked at 12.5 percent) to 2005. Despite heterogeneity among provinces' varying approaches to welfare seen earlier in Table 1, the fact that every province experienced large declines in welfare participation leaves open the possibility that macroeconomic factors positively shocking all provinces were largely responsible for the observed declines. Nevertheless, the heterogeneity among provinces remains striking. Alberta's welfare participation rate declined by more than 66 percent (the largest percentage change in Table 2) while Newfoundland's declined by less than 18 percent. Ontario had by far the largest absolute decline in welfare participation rates, dropping by 8.6 percentage points.

Standard Reform Tool #1: Reducing Welfare Benefits

Each province has its own formula mapping household type (i.e., numbers of adults and children in the household) of welfare-eligible individuals into benefit levels for individuals in that household.¹¹ Table 3 shows percentage declines in real welfare benefit levels (expressed in 2007 Canadian dollars) for individuals classified, respectively, in the three most common household types. Benefit levels fell in nearly all provinces across most household types.¹² In general, provinces aggressively reduced welfare benefit levels between 1994 and 2005. As can be seen from Table 3, some provinces such as British Columbia, Ontario and Saskatchewan reduced benefits fairly evenly across different household types. Alberta, Manitoba, New Brunswick, and Prince Edward Island, on the other hand, cut benefits more sharply for childless welfare recipients (listed in Table 3 under the column labeled *Single, No Child*), more than twice

¹¹ Social assistance participants are individuals rather than households. A household can have multiple social assistance participants who are counted individually as welfare participants. Formulas used by provinces to compute individual benefit levels depend, however, on the individual's household type.

¹² These trends in Canada contrast with those in the U.S., where states were more constrained in their ability to reduce benefit levels.

as much as for individuals in *Single Parent, One Child* households.¹³ Despite the overall trend of benefits reductions, Newfoundland raised real benefits for individuals in *Single, No Child* households by a remarkable 45 percent while hardly adjusting real benefits for the other two household structures over the same 11-year period.¹⁴

Standard Reform Tool #2: Tightening Eligibility Requirements

Eligibility requirements include means tests, asset exemption limits, age restrictions on teenage participation, and residency requirements.¹⁵ Unfortunately, there are insufficient data to individually code all these dimensions used by provinces to vary welfare eligibility requirements. The coding approach here focuses on provinces' maximum liquid asset exemption levels (expressed in 2007 Canadian dollars). Applicants with liquid assets in excess of this dollar amount are not eligible for welfare. Compared with benefit levels, there is far less year-over-year change in asset exemption levels within each province, although when changes do occur, they tend to be rather large.¹⁶

¹³ Classifying household types is not always straightforward, especially the designations *single* and *coupled*. Following the National Council of Welfare's interpretation of these terms, *single* refers to an adult living at an address with no other adults living at the same address. By this definition, the label *single* provides no definitive information about relationship or marital status. One presumes that *single* correlates with being unmarried and, perhaps more weakly, with having no partner to provide financial support and assist in raising children. Similarly, the designation *coupled* refers to an adult living at an address with precisely one other adult.

¹⁴ According to the National Council of Welfare, Newfoundland's unusual rise in benefits levels for the childless arose as a shift between two rather extreme policies (NCW, 2003; personal communication with D. Richard, February 9, 2010, Researcher and Policy Advisor at the National Council of Welfare). LexisNexis searches for news accounts of large changes in welfare benefit levels in Newfoundland during this period did not uncover any stories in the local press, however, suggesting the possibility of a discrepancy between reported benefits levels and those actually used. Inspecting Newfoundland's benefit levels time series year by year, one finds that the province reduced benefits for *Single, No Child* recipients between 1996 and 1999. Thereafter, the province repeatedly raised benefit levels for individuals classified as *Single, No Child*, reaching what is, as of 2005 (and at the time of writing), the highest benefit level for this household type across all province-years.

¹⁵ One of the most well known shifts in eligibility requirements occurred in 1987, when Ontario passed the "spouse in the house" rule that expanded eligibility for welfare by enabling unmarried, cohabitating couples to qualify for welfare as single adults for up to three years. Ontario's policy was unique among provinces and led to an estimated increase of 9,000 single parents who were made newly eligible for welfare (Holden, 1987), providing one example of the potential importance of changes (in both directions) in eligibility requirements.

¹⁶ For example, British Columbia in 1992 raised asset exemption limits from C\$1500 to C\$5000 (in nominal terms) after having left them unchanged for six years and later reduced the exemption limit to C\$2500 in 2002.

New Reform Strategies

Despite the variation in benefit levels and eligibility requirements described above, some observers have argued that experimentation with new welfare reform strategies exerted even stronger influence on welfare participation in Canada (NCW, 1997; Gorlick and Brethour, 1998). According to Table 1, there were four broad categories of new reform strategies adopted in some provinces, which are described below.

Work Requirements. Work requirements refer to policies that require welfare participants to search for work, participate in job training programs, volunteer, or hold a job in the private or public sector. Typically, welfare participants are required to regularly document job search, training, and work activities. Depending on province and year, failure to comply with these work requirements can result in sanctions (i.e., penalties, usually in the form of reduced payments). Provinces' policies differ both in terms of *whether* and *how much* welfare participants lose for failing to comply with work requirements. The coding scheme adopted here classifies work requirements as *Weak* if sanctions for non-compliance require forfeiting more than zero and less than 100 percent of the monthly benefit payment.¹⁷ Work requirements are considered *Strong* if welfare participants face losing 100 percent of the welfare benefits for non-compliance.¹⁸

Diversion. Diversion refers to policies that seek to reduce the number of those who complete applications for welfare, encouraging or requiring would-be welfare participants to tap other sources of income instead. The rationale for diversion is straightforward: even if it incurs

¹⁷ Sanctions in province-years with *Weak* work requirements typically amount to \$100 or less per month.

¹⁸ This classification scheme follows convention frequently used in studies with US data (e.g., Danielson and Klerman, 2008). Since Newfoundland and Quebec (with the exception of the years 1990 through 1994) had work requirements with no sanctions to punish non-compliance, they are coded as having no work requirement at all. As part of this classification, stringency of enforcement was considered as well – for example, how easy it is for recipients facing sanctions to appeal, and whether welfare case workers have discretion not to impose sanctions.

up-front costs, diversion can (at least in theory) save the welfare system money over the long term by reducing the number of new entrants, thereby reducing the probability that they wind up as long-term welfare participants. Diversion is classified as *Weak* if the policy is in essence an information campaign that notifies would-be welfare applicants about work opportunities, eligibility for other government programs (e.g., unemployment insurance), or spousal and/or family support they are already entitled to collect (especially alimony and child support payments).¹⁹ Diversion is classified as *Strong* if case workers who screen welfare applicants have discretion to do *one* of the following: offer immediate cash loans or one-time payments (e.g., to cover short-term job- or job-search-related costs); institute waiting periods that automatically delay eligibility for would-be applicants; or require would-be applicants to liquidate all assets, move in with relatives, visit food banks, or satisfy other prerequisites that must be undertaken before welfare applications are considered. Since 2002, British Columbia requires applicants to document job search efforts during a mandatory three-week waiting period before proceeding with an application and receiving the first welfare payment.

Earning Exemptions. Historically, welfare participants face very high implicit marginal tax rates, as income from employment typically results in loss of means-tested benefits (Anderson, 1978; Wolfe, 2002; and Grogger and Karoly, 2005). Earning exemptions are essentially tax cuts on the labor market earnings of welfare recipients, aiming to encourage work by exempting some portion of labor market earnings from taxes. Coding focuses on two parameters that characterize a province's earnings exemption policy. First, there is a threshold up to which point earnings are not taxed at all, typically in the range of C\$100 to C\$300 per

¹⁹ Increasing hassle costs faced by new applicants is another mechanism through which diversion can affect welfare participation. The diversion strategy typically requires applicants to complete lengthy questionnaires and provide additional documentation, which raises the cost of applying.

month. The second parameter is the marginal tax rate applied to labor market earnings above this threshold. Table 1 classifies province-years as having earnings exemptions if: (1) the threshold of allowable tax-free earnings is strictly greater than zero, *and* (2) the marginal tax rate for earnings above this threshold is strictly less than 100 percent.²⁰

Time Limits. Time limits refer to policies that stipulate a maximum duration for which welfare benefits can be received. In Canada, British Columbia is the only province to ever institute time limits. British Columbia's time limits allow welfare participants to receive benefits for a maximum of two years out of every five-year period.²¹

3. DATA SUMMARY AND MODELS OF WELFARE PARTICIPATION

Data Sources

Data on welfare participation, welfare benefit levels, as well as earnings and asset exemptions, were obtained from the National Council of Welfare (1987) and its *Welfare Incomes* series published nearly every year from 1990 through 2008.²² Province-specific population counts, demographic information, unemployment rates, real GDP growth, and real unemployment insurance payouts²³ were collected from data files compiled by Statistics Canada.²⁴ Finally, minimum wage rates were obtained from the *Minimum Wage Database* compiled by Human Resources and Skills Development Canada (2009).

²⁰ Models reported below include these two earnings exemptions variables and an interaction term.

²¹ In the U.S., time limits were first introduced under PRWORA. This federal law imposes a five-year lifetime limit. Some states have enacted lifetime limits as low as two years. British Columbia's revolving five-year window can be regarded as a weaker hybrid. Large numbers of participants in both the U.S. and British Columbia qualify for exemptions from time limits, which adds to the difficulty of categorically ranking one welfare system as more stringent than the other.

²² We were unable to locate usable data measuring the proportion of welfare participants who were disabled across all province-years. Thus, welfare participation rates include disabled receiving social assistance benefits in both the numerator (number of welfare participants) and denominator (population age 64 and under).

²³ Canadian data sources use the term "employment insurance" in place of "unemployment insurance."

²⁴ Statistics Canada data files used in building the data sets for this paper are: *Provincial Economic Accounts*, *Income Trends in Canada 1976 to 2007*, CANSIM database tables 051—0012, 051—0020, 051—0012, 276—0001, 282—0086, 384—0009, and the *Labour Force Survey* (Statistics Canada, 2007, 2009, 2010a, 2010b).

Summary Statistics

Table 4 presents summary statistics for variables used in subsequent regression models. The number of observations is 200, resulting from 10 provinces observed over 20 years.²⁵ Between-province variance is greater than within-province variance (although these contrasts are not shown in Table 4). The dependent variable is welfare participation, measured as the fraction of the non-elderly population (age 64 and under) counted as welfare participants in each province-year, labeled PARTICIPATION, which ranges from a minimum of 1.97 percent (Alberta in 2002 and 2005) to a maximum of 15.27 percent (Newfoundland in 1997).²⁶

Recall that Table 1 classifies province-years into four distinct new reform strategies. Table 1 further breaks down work requirements and diversion into *Weak* and *Strong* stringency categories, based on publications by provinces, researchers and news accounts uncovered in Lexis-Nexus searches. Also, as discussed above, variation across province-years in earnings exemptions requires two variables to code threshold levels and marginal tax rates (on earnings above the thresholds). An interaction term for the earnings threshold and earnings tax is included in some regressions. Coded as finely as possible, the information generated by heterogeneous new reform strategies can be represented as the following eight variables:

WORKREQ_STRONG, WORKREQ_WEAK, DIVERSION_STRONG, DIVERSION_WEAK, and TIMELIMITS (dummy variables that take on the value of 1 in province-years in which these

²⁵ Appendix V lists and describes all variables used in this study. The appendices provide additional detail on source documents and discussions of how new reforms were interpreted and coded as *Weak* versus *Strong*. These are not intended to be published but rather are made available for those interested in further detail underlying the coding of new reform variables.

²⁶ We also experimented with transformed versions of the dependent variable (e.g., natural log and re-scaled arc-tan transformations) mapping the unit interval to theoretically unbounded subsets of the real number line. These transformations led to greater asymmetry (i.e., skewness or non-normality) in the corresponding empirical distributions and increased the influence of observations in the tails of the distribution. Thus, untransformed welfare participation rates appeared to be the best option for the dependent variable in the empirical welfare participation models reported in the next section.

policies are active, and 0 otherwise), plus two earnings exemption variables and their interaction, `logEARNINGS_THRESH`, `EARNINGS_TAX` and `THRESH_TAX_INTERACT`.²⁷ New reform strategies coded as indicator variables that were adopted mid-year are represented by a fraction based on the number of months (out of 12) that those policies were in effect.²⁸ A second set of empirical models is specified with a *coarsely* coded single variable `NEWREFORM`, which takes on the value of 1 in any year in which three or more of the new reform strategies were in effect.

According to Table 4, the mean of 0.15 for `WORKREQ_STRONG` indicates that 15 percent of the 200 province-years in the sample have strong work requirements in effect. Table 4 also shows that weak work requirements were more common in Canada, having been active in 26 percent of province-years. The mean value of `EARNINGS_TAX` in Table 4 shows the high marginal tax rate of 82 percent faced by welfare participants (in the mean province-year) on labor market earnings above the exemption threshold level. The mean of 0.21 for the coarsely coded `NEWREFORM` (included only in the second set of regression results presented in the next section) indicates that 21 percent of province-years have three or more new reform strategies (weak or strong) in effect.

The macroeconomic variables `UNEMPLOYMENT` and `REALGDPGROWTH` fluctuate considerably, which is of course beneficial for precision in estimation. The empirical models

²⁷ Real maximum earnings thresholds (`logEARNINGS_THRESH`) were transformed by adding a dollar to each value and then taking natural logs.

²⁸ A potentially important issue concerns coding of policies implemented in month $m \in \{2, 3, \dots, 12\}$ of year t and possible sensitivity of regression estimates to whether these policies are coded as occurring in year t or year $t + 1$. Three approaches were investigated, which turned out to produce barely noticeable differences in estimated regression coefficients. The first approach was “aggressive time coding” indicating 1 in the year of implementation (t) regardless of the month in which it began. The “intermediate time coding” approach assigned the value of 0 to the reform variables in years prior to t , a value of $(13 - m)/12$ in year t , and a value of 1 in all years thereafter in which the policy remained in effect. Policies that were discontinued received a fractional value that similarly depended on how many months the policy remained in effect. Finally, the “conservative time coding” approach assigned 1 to the reform variable in year $t + 1$ and 0 prior to that. None of these different schemes for coding policy variables led to substantial differences, whether policies implemented and discontinued mid-year were considered to be in force retroactively from the beginning of the year, fractionally throughout the year, or only in effect the following year.

include two lags of each of the two macroeconomic variables, not listed as separate rows in Table 4 because lagged variables have nearly identical empirical distributions.

Table 4 shows that the variable measuring benefit levels, `logBENEFITS_SINGLE_ONECHILD`, ranges from 9.46 to 10.00 covering slightly more than 50 log-approximated percentage points.²⁹ The variable `logASSET_THRESH`, which proxies for different eligibility requirements with higher asset thresholds indicating more lenient rules, has a range of variation of 2.16. This range is substantially larger than for benefit levels, translating to approximately 216 percentage points relative to the mean.

In addition, the models include controls for labor market policy tools, namely the log of the real minimum wage (`logMINWAGE`) in each province-year, as well as the log of real annual per capita unemployment insurance transfer payments for non-elderly out-of-work Canadians (`logUNEMP_INS`). Where applicable, all variables measured in Canadian dollars are converted from nominal to real by re-expressing in units of \$C2007.

Finally, the models include five controls for demographic differences across provinces and through time. The proportion of the 64-and-under population who are single parents is measured by the variable `SINGLEPARENTS`, providing an important control for exogenous differences in demand for welfare. The interprovincial rate of migration (i.e., the net number of

²⁹ The models in this paper use benefit levels for individuals whose household type is *Single Parent, One Child* as a proxy for fluctuations in all benefit levels. As the heterogeneous changes in benefit levels across household types in Table 3 show, any scalar-valued proxy is necessarily imperfect, because those changes were non-uniform across household types. According to Human Resources and Skills Development Canada (HRSDC, 2006), 61 percent of all adult welfare recipients in 2005 (excluding the disabled) had *Single, No Child* household status, while another 21 percent were *single* with at least one child. Alternate runs of all models reported here using a weighted average index of benefit levels in different province-years are available from the authors. Two points argue in favor of using *Single, One Child* benefits as a proxy. First, the anomalous 45 percent increase in benefits for childless welfare recipients makes Newfoundland a troublingly influential outlier. Pair-wise correlation between *Single, No Child* and *Single, One Child* benefit levels is 0.70 when Newfoundland is excluded (over the sample of 190 province-years) and just 0.38 when included (based on all 200 province-years). The second point is that single parent households tend to have longer spells on welfare (Barrett and Cragg, 1998) and therefore substantially larger per-case costs that account for a larger share of all social assistance transfer payments.

people moving into each province as a fraction of the destination province's non-elderly population) is given by MIGRATION. Differences in education outcomes are crudely proxied for by the each province-year's high school dropout rate, labeled DROPOUT. This could be a relevant difference in demand for welfare, assuming that provinces with more formal education have more skilled workers and therefore less need for income support programs (Coelli, Green and Warburton, 2007). The variable ELDERLY records the ratio of the numbers of over-64 residents to 64-or-under residents in each province-year.³⁰ The number of non-permanent residents per non-elderly person in each province-year is measured by NONPERM_RESIDENTS, which includes people claiming refugee status; people holding a study, work or Minister's permit; and/or non-Canadian-born dependants of non-permanent residents.

Empirical Models

Empirical models begin with a benchmark model labeled Model A that includes only new reform variables without other controls. Model B adds macroeconomic factors with one- and two-year lags. Model C adds the standard welfare reform tools (namely, benefit levels and eligibility requirements) together with the closely related labor market policy tools (minimum wage and unemployment insurance). Model D adds the five demographic variables. Models that include province fixed effects are labeled "+PFE" and those that include year fixed effects are labeled "+YFE".

³⁰ Two countervailing effects are possible: a province with a greater-than-average ratio of elderly residents could provide additional childcare services that enable working-age people with children to work more. Or the elderly ratio might represent yet another demand on working-age people's time, reducing their chances of labor market participation (and increasing chances of welfare participation).

The summary statistics in Table 4 describe eight new reform variables *finely coded*, including one interaction term for the two earnings exemption variables, which capture cross-province and temporal variation in new reform strategies. Model A is:

$$Y_{it} = \alpha + \text{NRS}_{it}'\mu + \varepsilon_{it}, \quad (1)$$

where Y_{it} represents the welfare participation rate in province i (ranging from 1 to 10) in year t (ranging from 1986 to 2005); NRS_{it} represents an 8x1 vector of new reform strategy policy variables: $\text{WORKREQ_STRONG}_{it}$, WORKREQ_WEAK_{it} , $\text{DIVERSION_STRONG}_{it}$, $\text{DIVERSION_WEAK}_{it}$, TIMELIMITS_{it} , $\log\text{EARNINGS_THRESH}_{it}$, EARNINGS_TAX_{it} and $\text{THRESH_TAX_INTERACT}_{it}$ (the interaction term between the two earning exemption variables). NRS_{it}' represents the transpose of NRS_{it} ; μ is an 8x1 vector of coefficients on the new reform strategy variables; ε_{it} represents unobserved heterogeneity, assumed to have zero mean and a block diagonal variance matrix that allows for within-province correlation while assuming between-province independence; and α is the coefficient on the constant.

For ease of seeing the encompassing relationship among the models built up by successively including additional variables, these models are denoted using an abuse of notation that re-uses Greek symbols that are (and should be denoted as) distinct mathematical objects.

Model B adds the 6x1 vector M_{it} , which includes UNEMPLOYMENT and REALGDPGROWTH and their two respective lags. Model B is:

$$Y_{it} = \alpha + \text{NRS}_{it}'\mu + M_{it}'\rho + \varepsilon_{it}, \quad (2)$$

where ρ is a 6x1 vector of coefficients that represent the marginal effects of the macroeconomic variables on welfare participation. All other symbols are defined analogously to Model A (with the caveat that each re-used symbol is quantitatively distinct from previous and future appearances of that symbol in other models).

Model C includes the standard reform policy tools (benefit levels and eligibility requirements) and two labor market policy tools (minimum wage and unemployment insurance benefits). The 4x1 vector SRT_{it} stacks the variables: $\log ASSET_THRESH_{it}$, $\log BENEFITS_SINGLE_ONECHILD_{it}$, $\log MINWAGE_{it}$ and $\log UNEMP_INS_{it}$. Model C is:

$$Y_{it} = \alpha + NRS_{it}'\mu + M_{it}'\rho + SRT_{it}'\pi + \varepsilon_{it}, \quad (3)$$

where π is a 4x1 vector of coefficients measuring the expected change in welfare participation from a one-unit change in these four policy variables that influence labor market conditions. By including minimum wage and unemployment benefits in the same block of variables in which the standard welfare reform tools appear, the goal is to make it more difficult for the effect sizes on new reform policy variables to survive the inclusion of standard reform tools, which are likely to have important joint interactions with minimum wages and unemployment insurance payments. The intent is to conservatively compare the explanatory power of new reform policy variables with that of benefit levels and eligibility requirements.

Next, Model D includes five demographic variables that measure changes in the composition of the population in each province-year. The 5x1 vector D_{it} stacks the variables: $SINGLEPARENTS_{it}$, $MIGRATION_{it}$, $DROPOUT_{it}$, $ELDERLY_{it}$, and $NONPERM_RESIDENTS_{it}$, and Model D is given by:

$$Y_{it} = \alpha + NRS_{it}'\mu + M_{it}'\rho + SRT_{it}'\pi + D_{it}'\kappa + \varepsilon_{it}, \quad (4)$$

where κ is a 5x1 vector of coefficients measuring effects on welfare participation of one-unit changes in each demographic variable.

Province fixed effects (PFE) are the 9x1 vector of coefficients λ multiplying province indicators stacked in the 9x1 vector L_i (for location) consisting of time-invariant dummies for all provinces other than Alberta (the province with the largest percentage reduction in its welfare

participation rate, which serves as the omitted reference class).³¹ Year fixed effects (YFE) are the 19x1 vector of coefficients τ multiplying year indicators stacked in the 19x1 vector T_t (for time) consisting of dummies for all years other than 1986 (the first year in the sample, which serves as the omitted reference class).³² The fully encompassing model, with all regressors, province and year fixed effects, is referred to as Model D+PFE+YFE:

$$Y_{it} = \alpha + NRS_{it}'\mu + M_{it}'\rho + SRT_{it}'\pi + D_{it}'\kappa + L_i'\lambda + T_t'\tau + \varepsilon_{it}. \quad (5)$$

The standard errors of estimated coefficients for all models specified above are computed using Arellano's (1987) clustered covariance matrix (CCM) technique, which assumes that ε_{it} is uncorrelated between provinces but autocorrelated within province.³³ This estimator produces noticeably larger standard errors that deflate t statistics and make it more difficult for the model to find statistical significance. The reduced likelihood of finding statistical significance is desirable because the statistically significant effects that do emerge are conservative in the sense of having demanded more from the data to reach significance. Under classical assumptions for a panel model based on N units (provinces) observed for T periods and with K regressors, the degrees of freedom for t statistics is $NT - K - 1$.³⁴

³¹ If i represents any province other than Alberta, then the i th element of L_i is 1, and all other elements are zero. If i represents Alberta, then all 9 elements of L_i are 0. Province fixed effects provide a coarse set of controls for difficult-to-measure differences in provinces' other policies, culture, and physical capital per worker (perhaps absorbing too much variation but tending to shrink other estimated effects).

³² If $t > 1986$, then the t th element of T_t is 1, and all other elements are zero. If $t = 1986$, then all 19 elements of T_t are 0. Year fixed effects measure an arbitrary time trend common across all provinces.

³³ Bertrand et al. (2004) caution that, without proper control for autocorrelation, standard measures of statistical significance are misleading.

³⁴ Arellano's (1987) method is appropriate when $N > T$. For the case of the data in this paper where $T > N$, however, Hansen (2007) proposes a more conservative measure of degree of freedom, $N - 1$, when using CCM to control for autocorrelation. Therefore, how one interprets the t statistics in Tables 5 and 6 (presented in the next section) depends on whether Hansen's or Arellano's distributions for t statistics are assumed. Under classical assumptions of a t distribution with $200 - (9 + 19 + 23 + 1) - 1 = 156$ degrees of freedom (based on 9 province fixed effects, 19 year fixed effects, 23 other regressors, and a constant in Model D+PFE+YFE), a t value of magnitude 1.65 cuts off a 2-sided 90 percent confidence region; and a t value of magnitude 1.98 cuts off a 2-sided 95 percent confidence region. Under Hansen's more conservative approach with $10 - 1 = 9$ degrees of freedom, the critical t values are 1.83 and 2.26, for 90 and 95 percent confidence levels, respectively.

4. RESULTS

Table 5 presents estimated coefficients and t statistics for Models A+PFE+YFE through D+PFE+YFE (i.e., Models A through D with province and year fixed effects). These models suggest that work requirements with strong sanctions are associated with the largest reductions in welfare participation among all other policy tools used to implement welfare reform. Estimates from Model D for WORKREQ_STRONG suggest that the enactment of work requirements with strong sanctions reduced welfare participation by 2.54 percentage points, with a t value of 2.0. Relative to the unconditional mean welfare participation rate of 8.97 percent (averaging across province-years, not weighted by population), province-years with strong work requirements reduced welfare participation by 27 percent. Work requirements with weak sanctions (WORKREQ_WEAK) also have statistically significant effects on welfare participation, with an effect size of 39 to 57 percent as large as strong work requirements, depending on the model. That work requirements are associated with reduced welfare participation rates is generally consistent with studies based on US data (see Grogger and Karoly, 2005, for a survey). The differential effects of stringency of sanction policies have generally received less attention, although some US studies find that more stringent sanction policies are associated with additional reductions in welfare use of 16 to 39 percent (Rector and Youssef, 1999; Danielson and Klerman, 2008).³⁵

Table 5 also suggests that diversion strategies (weak or strong) have little effect on welfare participation in the presence of other policy tools and controls.³⁶ Few studies have

³⁵ For contrasting results, see Hofferth, Stanhope, and Mullan Harris (2002), who find that sanctioning policy has no impact on welfare exit rates. Likewise, Macurdy, Mancuso, and O'Brian-Strain (2002) conclude that neither work requirements nor sanctioning policy have significant effects on welfare participation in the U.S.

³⁶ Diversion has very strong, negative coefficients when province fixed effects are excluded. Likewise, Appendix B, presents benchmark regression results that include bivariate models showing that, without other variables in the model, strong diversion has a large negative association with welfare participation rates.

sought to measure the degree to which diversion affects welfare participation. In part, this is due to diversion strategies often being so nuanced across different jurisdictions as to preclude uniform coding for econometric models. Declines in welfare entry rates in Canada suggest that diversion may play an important role (Finnie, Irvine, and Sceviour, 2005). Green and Warburton (2004) examine the impact of tightened eligibility requirements in British Columbia for a short period between 1995 and 1996. They find that added caseworker scrutiny (one interesting dimension of diversion) had no long-term impacts on welfare participation.

Time limits are associated with negative, but statistically insignificant, effects on welfare participation. This contrasts with bivariate regressions in which time limits had large unconditional negative associations with welfare participation (see Appendix B). It is possible that some welfare participants anticipated the implementation of British Columbia's time limits and exited social assistance prior to its implementation so as to ration eligibility, thus reducing the explanatory power of this policy variable.³⁷ US data indicate that time limits reduce welfare participation (Swann, 2005; Grogger, 2004; and Grogger, Haider and Klerman, 2003).

Estimated coefficients in Table 5 can be combined with information from Table 4 to compute marginal effects with respect to a doubling of the earnings threshold. For a province-year with the mean marginal tax rate of 82.08, the expected change in the welfare participation rate associated with a one-unit increase in `logEARNINGS_THRESH` (an approximate doubling of the threshold) is computed based on Model D+PFE+YFE as $1.32 - (0.02 \times 82.02) = -0.0483$, which turns out to fall short of statistical significance. The effect sizes for this marginal effect are small across all the models in Table 5 (0.1 or less). Similarly for the marginal effects associated with large changes in the marginal tax rate. This indicates that (at least in the presence of other

³⁷ Coding time limits according to when British Columbia first made public its intentions to limit welfare use (late in 2001), however, did not qualitatively change this findings.

new reforms and controls in the models in Table 5) earnings exemptions do not tend to coincide with large changes in welfare participation, all else equal.

Comparing the four models from left to right in Table 4 (as macroeconomic factors, labor market policy tools, and demographics are successively added to the model), one sees that unemployment rates have large and statistically significant effects but that none of the additional blocks of variables make the effect of strong work requirements disappear. The unemployment coefficients in Model D+PFE+YFE (which are jointly significant) imply that, if unemployment declines by one percentage point for one year and then returns to its average, then the welfare participation rate is expected to rise by 0.68 after two years ($= 0.45 + 0.20 + 0.03$). This implies a roughly two-thirds percentage point rise in welfare participation predicted within two years for every one percentage point rise in unemployment. Summing the three coefficients for real GDP growth and its two lags yields the prediction that, following a temporary one percentage point increase in GDP growth, welfare participation is expected to fall by 0.07 percentage points within two years (which is not statistically distinguishable from zero).

Model C+PFE+YFE adds other policy variables as competing explanations for the observed declines in welfare participation. The coefficients on `logBENEFITS_SINGLE_ONECHILD` are large but imprecisely estimated, indicating an approximate 2 percentage-point increase in welfare participation rates associated with a doubling of benefit levels for single parents with one child. Although the literature on benefit levels is mixed, the benefits effects in Table 4 are consistent (although one would of course prefer greater statistical precision) with important micro-data findings by Allen (1993), that frequency of child birth, divorce, and welfare participation are positively associated with benefit levels. Another important point of comparison in the benefits literature for interpreting coefficients in Table 5 is

Milligan and Stabile (2007), who find that reductions welfare benefits—which occurred in Alberta, Manitoba, Nova Scotia, Ontario, and Prince Edward Island—could account for 19 to 27 percent of the decline in welfare participation in those provinces.

Counter to intuition, the two models in Table 5 that include asset exemption levels (`logASSET_THRESH`) imply that increasing this variable (making eligibility requirements more lenient) would be associated with reductions in welfare participation rates. The effect size is rather small, however, with a 10 percent loosening of this eligibility requirement predicting increases in welfare participation rates in the hundredths rather than tenths of percentage points. Estimates for effects of changes in minimum wage and unemployment insurance are large but statistically insignificant. The negative coefficients on `logUNEMP_INS` suggest that unemployment insurance benefits function as a substitute for going onto welfare. Finally, considering the demographic information in Table 5, none of these variables were individually or jointly significant (statistically or economically).

New Reform Strategies as a Single Policy Variable

To facilitate comparison with Kneebone and White (2009) and studies using US data, this section collapses the eight new reform variables used in the models reported in Table 5 to a single variable, referred to here as `NEWREFORM`, which takes on the value 1 in province-years with three or more new reform strategies in effect, and 0 otherwise. Five provinces are in the treatment group as indicated by `NEWREFORM`, although during different time periods: Alberta (March 1993–), British Columbia (January 2002–), Ontario (September 1996–), Prince Edward

Island (June 1995–), and Saskatchewan (May 2001–). Province-years not indicated on that list comprise the control group.³⁸

Table 6 reports estimates only of models including all the regressors, with three versions varying in terms of province and year fixed effects. In Model D with no fixed effects, the effect of NEWREFORM on welfare participation rates is estimated to be -2.49 ($|t| = 4.0$). After including province and year fixed effects, the effect size falls by more than half to -1.16 ($|t| = 1.7$) in Model D+PFE+YFE. Even this reduced effect size represents a 12.9 percent reduction relative to the unconditional mean rate of welfare participation in the sample. Most of the reduction in the effect size of NEWREFORM occurs moving from Model D to D+PFE (after including labor market policy tools). Although effects of changes in benefit levels are once again estimated imprecisely, from Table 6 it can be computed (dividing the coefficient on NEWREFORM by the coefficient on `logBENEFITS_SINGLE_ONECHILD`) that, in order to decrease the expected participation rate by the same amount as in a province enacting NEWREFORM, a province would have to decrease benefit levels by 69, 21 and 32 percent (in Models D, D+PFE, and D+PFE+YFE, respectively).

Since a time series with a persistent long-run trend can lead to statistical anomalies that overstate statistical significance, as a robustness check, alternative estimates of the variables in these models were computed using the Hodrick-Prescott (HP) filtering technique, which separates a time series into a trend and residuals (Hodrick and Prescott, 1997). HP-filtered versions of each province's welfare participation time series, as well as all non-binary variables

³⁸ Prince Edward Island is somewhat of an outlier in that, from various accounts, its implementation of new reform strategies was substantially less aggressive than in the other four provinces. Restricting the treatment group to the provinces of Alberta, British Columbia, and Ontario (see Kneebone and White, 2009) produces an effect size for NEWREFORM of -1.92 ($|t| = 1.7$), as shown in Model D+PFE+YFE in Table 6. Thus, when the disaggregated new reform variables introduced in this paper are collapsed into a single variable indicating province-years with three or more new reform strategies in place, the empirical model in this paper qualitatively replicates Kneebone and White's estimates.

on the right-hand side of the model, were computed and models were re-estimated, which produced the same negative coefficient on NEWREFORM with even larger t statistics. As further robustness checks, models were run using differenced data and with lagged left-hand-side variables on the right-hand side, not once over-turning the qualitative finding of NEWREFORM's negative effect on welfare participation rates.

New Reform Strategies' Contribution to Observed Declines in Welfare Participation

Table 7 compares the contributions of the four most prominent factors - the implementation of new reform strategies, declines in the contemporaneous and long-run unemployment rates, and lower benefit levels - in explaining the observed decline in Canada's welfare participation rate from its peak in 1994 through 2005.³⁹

One basic question is whether the decline was due to policy, macroeconomic fluctuations, or something else? Table 7 indicates that the policies pursued by new reform users explain about 10 percent of the decline in welfare participation during this period using the most conservative model D+PFE+YFE, which is perhaps overparameterized with fixed effects absorbing much of the variation in participation rates.⁴⁰ Declines in the unemployment rate that occurred between

³⁹ The other factors, such as tightened eligibility requirements and changes to the minimum wage, were not statistically significant. This table was modeled after a table published in CEA, 1999, about the role of US policies in explaining post-1996 declines in US welfare participation. Column (1) shows estimated coefficients from Model D+PFE+YFE in Table 6. Column (2) shows the observed change in the province-population-weighted national average of each right-hand-side factor (computed as the 2005 observation minus the 1994 observation of x). Column (3) shows the expected change in the rate of welfare participation since 1994 based on the observed change in a single right-hand-side factor (holding all else equal), computed as the product (or sum of products) of the coefficient(s) in Column (1) and change(s) in x in Column (2). Column (4) translates expected declines in welfare participation (reported in Column (3) as changes in expected welfare participation rates in units of percentage points) into headcounts measuring the expected number of Canadians prevented from receiving welfare each year, attributable to changes in x on the right-hand-side, one factor at a time, equal what was actually observed from 1994 to 2005. Finally, Column (5) reports percentages of the observed decline attributable to different factors, computed as Column (3) divided by the observed percentage point decline in Canada's welfare participation rate of -6.4 (= 6.1 percent in 2005 minus 12.5 percent in 1994).

⁴⁰ A more stringent coding scheme for NEWREFORM consisting of indicators for provinces with work requirements with strong sanctions in place - that is, the provinces of Alberta, British Columbia, and Ontario - explains 16 percent of the decline in welfare participation over this period. This further reinforces the finding from

1994 and 2005 explain 19 percent when only contemporaneous unemployment is in the model, and 39 percent in the contemporaneous plus two-lag specification. Reductions in welfare benefits can explain about 12 percent of the decline – slightly more than the adoption of new reform strategies– although coefficients on welfare benefits in Table 6 were statistically insignificant, even under classical assumptions about the distribution of t statistics.

Kneebone and White (2009) find that new reform strategies in Alberta, British Columbia, and Ontario explain 47 to 65 percent of the reduction in welfare participation in those particular provinces between 1992 and 2003 (as opposed to declines in Canada, in general). They also find that changes in the unemployment rate explain only 11 to 21 percent of the declines. Their econometric model contains fewer control variables, which, judging from the substantially larger effect sizes on new reform policies that appear in the models from Tables 5 and 6 with fewer controls, may contribute to the larger effects they report. Table 7 also provides comparisons of effect sizes on new reform strategies versus unemployment rates in analogous empirical models based on US data. Compared to the relative contributions for Canada in Table 7, US studies generally find that new reforms played a relatively larger role than did reductions in unemployment rates. For instance, CEA (1999) finds that policies under the PRWORA comparable to new reform strategies accounted for about 36 percent of the decline in welfare participation between 1996 and 1998, while the unemployment rate accounted for only 8 percent.⁴¹

5. DISCUSSION AND INTERPRETATION

Table 5 that work requirements with strong sanctions is the policy tool with the largest empirical association with declines in welfare participation among policy effects estimated precisely enough to achieve statistical significance.

⁴¹ If new reform strategies have their largest effects shortly after implementation, then the much narrower time period in CEA (1999), as compared to the 13-year period of decline examined here, could explain the differences between our findings and those of US studies.

Welfare reform in Canada continues to spark controversy. The aspect that this paper intends to address concerns the descriptive question of whether new reform strategies actually achieved their stated goal of reducing the number of Canadians on social assistance. This paper contributes new empirical measures of changes in welfare policy based on province-level data and documents published by provincial and federal government agencies. The new reform strategies for which the coding scheme introduced here provides new empirical measures include: work requirements with sanctions, diversion, earnings exemptions, and time limits. By including controls for provinces' macroeconomic conditions and several other frequently studied policy tools, the econometric approach of this paper undertakes to set up a “horse race” among competing sources of variation, allowing the data to reveal which among them had the largest associated effect sizes.

Among the different new reform strategies implemented at the province level, it appears that work requirements with strong sanctions for non-compliance had the largest overall effect. Specifically, the presence of strong work requirements is associated with a 27 percent reduction in welfare participation, up to two-and-a-half times larger than the effect of work requirements with weak sanctions. Other new reform strategies had large standard errors and failed to achieve statistical significance. And, among these, only time limits had a large effect size.

To answer the question posed in the introduction regarding the differential effect of new reform strategies above and beyond that of benefit levels and eligibility requirements, the data suggest that new reforms -- in particular, work requirements with strong sanctions -- were at least as important as, and possibly more important than, reductions in benefit levels and eligibility requirements. New reform strategies, when coded coarsely as a single variable indicating province-years with three or more new reform strategies in effect, could explain about 10 percent

of the decline in welfare participation observed in Canada since 1994, roughly equal to the much less precisely estimated effects of reductions in welfare benefit levels, which occurred in most provinces from 1994-2005. Improving labor market conditions, as measured by provinces' declining unemployment rates, accounted for two to four times more of the observed reduction in Canada's welfare participation relative than new reform strategies did.

Contextualizing these findings is difficult given that we do not measure the proportion of welfare leavers who find employment or the well-being of welfare applicants that may be affected by these policies.⁴² This highlights an important limitation of using data aggregated to the province-year level, from which differential policy effects for vulnerable subpopulations are unavailable. Estimating the effects of new reform strategies on particular subpopulations such as immigrants (cf., Baker and Benjamin, 1995), or lengths of welfare spells among childless welfare recipients versus those with children (cf., Barrett and Cragg, 1998) requires micro-level data. The new reform policy measures introduced here will hopefully motivate further statistical investigation using micro-data to examine how these policy changes influenced rates of entry, exit, and participation among different subpopulations.

⁴² For instance, Hughes and McCuaig (2000) provide cautionary evidence about programs that send welfare recipients to work as child care workers and express concern about the general availability of child care for those who wish to leave welfare for work.

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Table 1: New Welfare Reform Strategies by Implementation Date (1986-2005)

Province	Work Requirements with Sanctions		Diversion		Earning Exemptions	Time Limits
	Weak	Strong	Weak	Strong		
Alberta	¹ Jan 1991 - Feb 1993	⁸ Mar 1993 -		¹⁶ Mar 1993 -	Jan 1986 -	
British Columbia	² Jan 1996 - Dec 2001	⁹ Jan 2002 -	¹² Jan 1996 - Dec 2001	¹⁷ Jan 2002 -	¹⁹ Jan 1986 - Dec 1995	²⁰ Apr 2002 -
Manitoba	³ May 1996 -				Jan 1999 -	
New Brunswick	⁴ May 1995 -				Jan 1996 - Dec 2004	
Newfoundland						
Nova Scotia		¹⁰ Aug 2001 -	¹³ Aug 2001 -			
Ontario		¹¹ Sep 1996 -		¹⁸ Jun 1996 -	Jan 1986 -	
Prince Edward Island	⁵ June 1995 -		¹⁴ April 1995 -		Jan 1990 -	
Quebec	⁶ Jan 1990 - Sep 1994				Jan 1986 - Dec 1988	
Saskatchewan	⁷ Jun 1997 -		¹⁵ May 2001 -		Jan 1989 -	

¹ The Supports for Independence program required welfare participants to look for work or obtain training, and failure to do so resulted in sanctions (NCW, 1992). However, these work requirements had little practical effect because participants could easily appeal the decision and retain benefits at least on an interim basis while waiting for their appeals to be heard (Jeffs, 1993). Therefore, these work requirements are coded as *weak*.

² Under the BC Benefits Act welfare participants were required to participate in work-related activity or have their benefits reduced (NCW, 1997).

³ Through the Employment and Income Assistance program welfare participants are required to complete an Action Plan that laid out their work-related responsibilities (NCW, 1997). Failure to fulfill one's Action Plan resulted in a \$50 sanction, which could rise to \$100 after six months. Since benefits cannot be fully eliminated, these work requirements are coded as *weak*.

⁴ Under the Family Income Security Act, welfare participants are required to take job training classes, perform a job search, or work (NB, 1995). Otherwise, they will face a reduction in benefits. Since benefits cannot be fully eliminated, these work requirements are coded as *weak*.

⁵ Under the Social Assistance Act welfare participants are required to look for work, attend school, or take part in job training classes (PEIHSS, 2003). Penalties for noncompliance were reportedly infrequent. Therefore, these reforms are coded as *weak*.

⁶ The Act Respecting Income Security provided welfare participants who engaged in work-related activity a bonus of roughly \$100 in additional welfare benefits (NCW, 1997). Since benefits cannot be fully eliminated for non-participation in work-related activities, these "sanctions" are coded as *weak*.

⁷ Under the Saskatchewan Assistance Plan welfare participants are required to set forth a personal transition plan outlining goals and responsibilities that would lead to self-sufficiency (Gorlick and Brethour, 1998). Penalties for noncompliance were reportedly infrequent. Therefore, these work requirements are coded as *weak*.

⁸ The Supports for Independence Program was slowly phased out in favor of the Alberta Works program. Under Alberta Works welfare participants are required to participate in work related activity or face sanctions that either reduced or eliminated benefits (AB, 2009).

⁹ The Employment and Assistance Act, which replaces BC Benefits, requires welfare participants to participate in work-related activity or have their benefits reduced by \$100 for two months (if a family with dependent children), or eliminated entirely (if a single adult) (BC, 2002).

¹⁰ The Employment Support and Income Assistance Act requires welfare participants to enter an Employment Action Plan (NS, 2008). The first instance of non-compliance could be sanctioned with a loss of benefits for 6 weeks; repeated non-compliance could result in loss of eligibility to welfare.

¹¹ Under the Ontario Works program welfare participants who do not participate in mandatory work requirements will have their benefits reduced, or cancelled, for three months at the first instance of non-compliance (ONCSS, 2008). This sanction increases to six months for subsequent offenses.

¹² The BC Benefits Act expected welfare applicants to have pursued all alternate sources of support before gaining access to welfare (BC, 1999). The province was also temporarily successful in requiring new residents to wait three months before becoming eligible for assistance (NCW, 1997). Finally, a short-lived pilot program required some districts to subject welfare applicants to added screening procedures. Despite these and other measures, however, the province demonstrated a questionable ability to enforce eligibility requirements, and are thus coded as *weak*.

¹³ Under the Employment Support and Income Assistance Act, welfare applicants are expected to pursue all other "feasible" forms of assistance, such as other government support programs like unemployment insurance benefits, child tax credits, and the like (NS, 2008). If, after evidence provided to case workers suggest the applicant is employable, the applicant must show some evidence of job search activity within the past 30 days. If the caseworker is satisfied that sufficient job search has been undertaken, then the applicant can be admitted onto welfare.

¹⁴ The Social Assistance Act requires that welfare applicants be informed of, and be strongly encouraged to pursue, other forms of assistance, such as Employment Insurance and Worker's Compensation benefits, prior to joining welfare (PEIHSS, 2003).

¹⁵ Under the Building Independence umbrella program welfare applicants are now processed through call centers (SK, 2002). Rather than enroll applicants into welfare immediately, callers are alerted to other means of support and, as necessary, diverted to the Jobs First program. The Job First program provides job training services to applicants and informs them of local job opportunities.

¹⁶ Under the Supports for Independence program employable welfare applicants are now required to wait before gaining welfare eligibility (NCW, 1997). The duration is unspecified but applicants may be required to first attend an orientation session before attaining eligibility to welfare. In addition, case workers have the discretion to deny eligibility for employable, single applicants (Boessenkool, 1997). Also, applicants are required to pursue all other forms of assistance, including liquidating their assets. Furthermore, case workers have the discretion to use funds to meet emergency needs other than through enrollment into welfare, such as providing the cost of transportation for applicants who agreed to move to a neighboring province.

¹⁷ The Employment and Assistance Act requires welfare applicants to wait three weeks, during which they were required to attend an orientation session and perform job search before gaining eligibility for welfare (BC, 2002). Also, applicants are not eligible for welfare unless they can show they have worked for two years in succession.

¹⁸ Ontario Works mandates that all welfare applicants pursue all other sources of income before eligibility to welfare can be obtained (ONCSS, 2008). These sources include food banks, untapped spousal support, and the liquidation of assets. Welfare applicants are processed through call centers that put applicants through a screening process. Documentation requirements are extensive.

¹⁹ In addition to 1986-1995, British Columbia again put earnings exemptions in place (temporarily) between 2001 and 2002 (NCW, 2002; 2003). In 2003, however, the province eliminated all earning exemptions (NCW, 2004). Since then, welfare participants pay 100 percent tax on all labor market earnings.

²⁰ In 2002, British Columbia implemented a time limit stipulating that applicants could receive benefits for a maximum of two years out of every five-year period (BC, 2002). Since that time, however, twenty-five classes of individuals have been exempted from such restrictions, including single parents with a child younger than three years of age.

Table 2: Changes in Welfare Participation* Rates Among Non-Elderly Canadians from 1994 to 2005, by Province

<u>Province</u>	<u>1994**</u> <u>Participation</u> <u>Rate</u>	<u>2005</u> <u>Participation</u> <u>Rate</u>	<u>Change in</u> <u>Percentage</u> <u>Points</u>	<u>Percentage</u> <u>Change</u>
Alberta	5.9	2.0	-3.9	-66.4
British Columbia	11.3	4.2	-7.1	-62.8
Manitoba	9.9	6.4	-3.5	-35.3
New Brunswick	11.6	7.3	-4.4	-37.5
Newfoundland	13.5	11.1	-2.4	-17.6
Nova Scotia	13.5	6.7	-6.8	-50.2
Ontario	14.9	6.3	-8.6	-57.8
Prince Edward Island	11.6	5.9	-5.7	-49.1
Quebec	12.8	8.1	-4.7	-37.0
Saskatchewan	10.0	6.2	-3.8	-37.6

* Most spells on welfare among Canadians last less than a year. In British Columbia, for example, Barrett and Cragg (1998) found that most welfare spells end within three months, and only 10 percent of welfare spells last longer than a year (mostly single parents). By contrast, the authors note that roughly 40 percent of spells on welfare in the U.S. last more than two years.

** Canada's national rate of welfare participation peaked in 1994.

Table 3: Percentage Changes in Real Welfare Benefits from 1994 to 2005, by Household Type*

<u>Province</u>	<i>Common Household Types</i>		
	<u>Single, No Child</u>	<u>Single Parent, One Child</u>	<u>Coupled, Two Children</u>
Alberta	-17.9	-8.6	-9.3
British Columbia	-24.1	-18.2	-17.1
Manitoba	-29.9	-6.1	-16.1
New Brunswick	-16.4	4.0	12.4
Newfoundland	45.2	-0.2	5.8
Nova Scotia	-28.8	-15.5	0.9
Ontario	-34.4	-31.2	-30.4
Prince Edward Island	-32.6	-12.7	-9.7
Quebec	-10.2	-5.8	3.0
Saskatchewan	-10.4	-12.3	-11.2

*The label *single* refers to an adult living at an address with no other adults and does not imply anything about marital or relationship status. It is possible for a person classified as *single* to be married, unmarried, with a romantic partner, or without, as long as those significant others do not reside at the same address. Similarly, *coupled* refers to households with two adults living at the same address. In 2005, about 61 percent of adult welfare recipients (excluding those categorized as disabled) were in the category *Single Adult, No Child*; 21 percent were *single* adults with at least one child; and about 10 percent were *coupled* with dependent children (HRSDC, 2006). The three household types in this table cover most welfare participants and are the most common classifications, they are not exhaustive.

Table 4: Summary Statistics (N = 200*)

<u>Variables**</u>	<u>Min</u>	<u>Mean</u>	<u>Median</u>	<u>Max</u>	<u>Std Dev</u>
<i>Dependent Variable***</i>					
PARTICIPATION	1.97	8.97	8.94	15.27	2.74
<i>New Reform Strategies (Finely Coded)</i>					
WORKREQ_STRONG	0.00	0.15	0.00	1.00	0.36
WORKREQ_WEAK	0.00	0.26	0.00	1.00	0.44
DIVERSION_STRONG	0.00	0.13	0.00	1.00	0.34
DIVERSION_WEAK	0.00	0.15	0.00	1.00	0.35
TIMELIMITS	0.00	0.02	0.00	1.00	0.13
logEARNINGS_THRESH	0.00	4.48	5.16	6.14	1.97
EARNINGS_TAX	50.00	82.08	80.00	100.00	16.07
<i>New Reform Strategies (Coarse)</i>					
NEWREFORM	0.00	0.21	0.00	1.00	0.40
<i>Macroeconomic Factors****</i>					
UNEMPLOYMENT	3.90	10.11	9.55	20.10	3.74
REALGDPGROWTH	-4.65	2.53	2.41	15.60	2.48
<i>Standard Reform Tools</i>					
logBENEFITS_SINGLE_ONECHILD	9.46	9.64	9.64	10.00	0.10
logASSET_THRESH	6.95	8.08	8.07	9.10	0.48
<i>Labor Market Policy Tools</i>					
logMINWAGE	1.76	1.94	1.93	2.18	0.09
logUNEMP_INS	5.62	6.70	6.66	7.92	0.59
<i>Demographics</i>					
SINGLEPARENTS	4.67	7.72	7.79	10.88	0.95
MIGRATION	-2.37	-0.19	-0.16	1.72	0.63
DROPOUT	7.10	13.64	13.45	23.04	3.53
ELDERLY	9.71	15.48	15.85	19.11	2.04
NONPERM_RESIDENTS	0.32	3.13	2.47	11.78	2.11

*200 observations are derived from 10 provinces observed at 20 points in time.

**Summary statistics for province fixed effects and year-specific dummy variables included in most versions of the model are not presented here. Inclusion of these indicator variables is indicated in the presentation of regression results.

***PARTICIPATION is the fraction of a province's population age 64 and under receiving welfare benefits in a particular year. Thus, PARTICIPATION is a rate and its units are percentage points, with a theoretical range of 0 to 100, and an empirical range of 1.97 (in Alberta) to 15.27 (in Newfoundland).

****Lagged versions of the macroeconomic variables, UNEMPLOYMENT and REALGDPGROWTH, are included in regression models reported later. Summary statistics for lagged variables are not shown because lagged and unlagged variables have (nearly) identical empirical distributions.

Table 5: Regression Results with Finely Coded New Reform Strategies, with Province and Year Fixed Effects

Variables	<i>Estimated coefficients and absolute t values for Models:</i>							
	<u>A+PFE+YFE</u>	<u> t </u>	<u>B+PFE+YFE</u>	<u> t </u>	<u>C+PFE+YFE</u>	<u> t </u>	<u>D+PFE+YFE</u>	<u> t </u>
<i>New Reform Strategies (Finely Coded)</i>								
WORKREQ_STRONG	-2.39	3.3	-2.19	3.9	-2.48	2.6	-2.45	2.0
WORKREQ_WEAK	-1.36	2.2	-1.21	2.4	-0.98	2.0	-0.97	2.0
DIVERSION_STRONG	0.18	0.1	-0.02	0.0	0.57	0.4	0.45	0.3
DIVERSION_WEAK	1.14	1.4	0.83	1.0	0.87	1.0	0.87	0.9
TIMELIMITS	-0.12	0.1	-1.34	0.9	-2.07	1.3	-1.43	0.7
logEARNINGS_THRESH	1.27	1.8	1.34	2.0	1.45	2.3	1.32	2.0
EARNINGS_TAX	0.04	1.3	0.07	1.6	0.06	2.0	0.06	1.5
THRESH_TAX_INTERACT	-0.01	1.5	-0.02	1.8	-0.02	2.2	-0.02	1.8
<i>Macroeconomic Factors</i>								
UNEMPLOYMENT			0.45	4.0	0.47	3.2	0.49	2.6
UNEMPLOYMENT_{t-1}			0.20	2.0	0.20	2.4	0.20	2.4
UNEMPLOYMENT_{t-2}			0.03	0.2	0.09	0.6	0.05	0.2
REALGDPGROWTH			0.00	0.1	-0.02	0.8	-0.03	0.7
REALGDPGROWTH_{t-1}			-0.02	1.0	-0.03	1.2	-0.04	1.5
REALGDPGROWTH_{t-2}			-0.05	1.5	-0.04	1.3	-0.05	1.2
<i>Standard Reform Tools</i>								
logBENEFITS_SINGLE_ONECHILD					1.89	0.5	2.36	0.6
logASSET_THRESH					-0.66	2.8	-0.57	1.8
<i>Labor Market Policy Tools</i>								
logMINWAGE					3.52	1.0	2.97	0.8
logUNEMP_INS					-1.83	1.3	-1.95	1.7
<i>Demographics</i>								
SINGLEPARENTS							0.07	0.4
MIGRATION							0.08	0.2
DROPOUT							-0.05	0.6
ELDERLY							-0.03	0.1
NONPERM_RESIDENTS							-0.13	0.9
Constant	3.06	1.3	-3.76	1.0	-11.97	0.3	-13.83	0.3
Province Fixed Effects	Yes		Yes		Yes		Yes	
Year Fixed Effects	Yes		Yes		Yes		Yes	
R-Squared	0.878		0.918		0.925		0.926	

Table 6: Regression Results with New Reform Strategies Coded as a Single Policy Variable, with and without Fixed Effects

<u>Variables</u>	<u>D</u>	<u> t </u>	<u>D+PFE</u>	<u> t </u>	<u>D+PFE+YFE</u>	<u> t </u>
<i>New Reform Strategies (Coarse)</i>						
NEWREFORM	-2.49	4.0	-1.24	2.1	-1.16	1.7
<i>Macroeconomic Factors</i>						
UNEMPLOYMENT	0.44	4.6	0.57	4.2	0.33	1.9
UNEMPLOYMENT_{t-1}	0.09	0.8	0.02	0.1	0.19	1.9
UNEMPLOYMENT_{t-2}	0.30	2.5	0.42	4.1	0.17	1.2
REALGDPGROWTH	-0.06	1.4	-0.03	0.8	-0.01	0.4
REALGDPGROWTH_{t-1}	-0.08	4.4	-0.07	3.5	-0.04	3.0
REALGDPGROWTH_{t-2}	-0.10	4.7	-0.07	2.3	-0.05	1.0
<i>Standard Reform Tools</i>						
logBENEFITS_SINGLE_ONECHILD	3.63	0.7	5.79	1.1	3.63	0.8
logASSET_THRESH	0.22	0.6	0.57	1.5	-0.01	0.0
<i>Labor Market Policy Tools</i>						
logMINWAGE	4.71	1.6	1.88	0.5	2.33	0.7
logUNEMP_INS	-2.42	3.7	-1.41	1.3	0.42	0.3
<i>Demographics</i>						
SINGLEPARENTS	0.47	2.2	0.39	2.1	0.23	1.1
MIGRATION	0.38	1.5	0.49	1.3	0.20	0.4
DROPOUT	-0.06	0.6	-0.13	1.6	-0.10	1.0
ELDERLY	0.17	1.5	0.06	0.3	-0.14	0.6
NONPERM_RESIDENTS	-0.07	0.3	-0.12	0.8	-0.13	1.1
Constant	-33.37	0.7	-57.61	1.3	-39.75	0.9
Province Fixed Effects	No		Yes		Yes	
Year Fixed Effects	No		No		Yes	
R-Squared	0.770		0.872		0.908	

Table 7: Per-Factor Contribution* to Observed Declines in Welfare Participation, 1994-2005

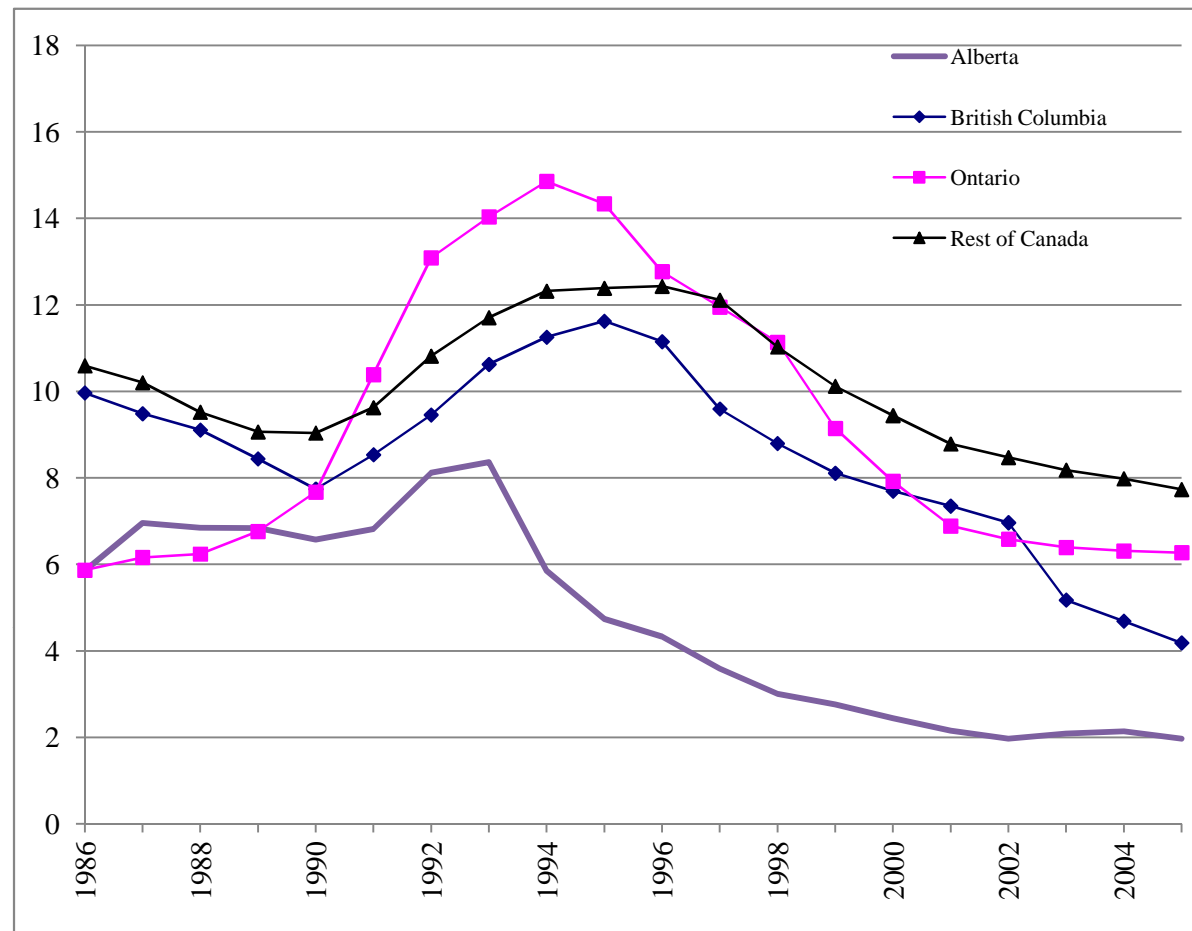
<u>Factor (x)</u>	(1) Estimated Coefficient (β) from Model D+PFE+YFE	(2) Change in each factor (Δx) from 1994 to 2005	(3) Expected Change in the Welfare Participation Rate ($\beta\Delta x$) from 1994 to 2005, Per Factor	(4) Expected Number of Canadians Prevented From Collecting Welfare Per Year, Per Factor	(5) Percentage Contribution to Explaining the Observed Decline in Welfare Participation 1994-2005
New Reform Strategies	-1.16	0.567	-0.66	-179,830	10.2
Decline in Unemployment	0.33	-3.656	-1.21	-331,045	18.8
Decline in Longrun Unemployment	0.69	-3.656	-2.52	-688,039	39.2
Lower Benefit Levels**	3.63	-0.204	-0.74	-201,733	11.5
Other					20.3

* The relative contribution in the last column of this table is the expected decline in welfare participation (from its peak in 1994 through 2005, given in the third column) divided by the observed (unconditional) decline in welfare participation during that same period, which was -6.4 percentage points. Column (1) repeats (or, in the case of Longrun Unemployment, Longrun GDP Growth and Demographics, computes a simple sum of) coefficients from Model D+PFE+YFE in Table 6. These coefficients are interpreted as the expected change in the annual rate of welfare participation (in units of percentage points on a zero to 100 scale) conditional on a one-unit change in the right-hand-side factor. Column (2) computes the 2005-province-population-weighted change in each right-hand-side factor (e.g., the 2005 province-weighted unemployment rate minus the 1994 province-weighted unemployment rate = -3.656). The change in New Reform Strategies of 0.534 is the fraction of Canadians in 2005 living in a province with new reform strategies in place (provinces in which NEWREFORM = 1) minus the fraction of Canadians in 1994 living in a province with new reform strategies in place.

Column (3) is the product of columns (1) and (2). Column (3) computes the mean Canadian province's expected decline in its annual rate of welfare participation attributable to changes in the right-hand-side factor from 1994 through 2005. In Column (4), the expected number of Canadians per year prevented from going onto welfare that is associated with observed changes in each x-factor is computed as the expected decline in welfare participation from Column (3) translated to headcounts using population data from 2005 (age 64 and under). In the final column, the per-factor contribution to explaining the observed (unconditional) decline of -6.4 percentage points is computed as the expected decline in Column 3 divided by -6.4. A negative contribution implies that the factor changed in a direction which, all else equal, would have increased welfare participation.

** Coefficient for logBENEFITS_SINGLE_ONECHILD not significant at either the 90 percent or 95 percent confidence level. Contribution of tightened eligibility requirements (proxied by logASSET_THRESH) omitted due to estimates not having either economic or statistical significance.

Figure 1: Time Paths of Welfare Participation in Canada*



* The large upward trend in Ontario welfare participation can be traced to a number of factors, including a decision by the province to raise welfare benefit rates every year between 1986 and 1992, as documented by the National Council of Welfare (1991, 1992).