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Abstract: *Heterogeneous welfare reform policies and timing of those policies among Canadian provinces reveal new information about the roles of different policy tools in accounting for declines in welfare participation. Work requirements, diversion, earnings exemptions, and time limits—referred to as new reform strategies—appear to explain at least 16 percent of observed welfare participation declines from 1994 to 2005, more than eligibility requirements and benefit levels explain. Conservative estimates imply that welfare participation falls by 1.9 percentage points (21 percent relative to mean welfare participation) in provinces and years with stringent combinations of new reform strategies in place.*

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

JEL Codes: H53, I38

New Reform Strategies and Welfare Participation in Canada

Section 1: Introduction

During the 1990s, the Canadian welfare system transformed from a relatively homogeneous, nationally administered system to a decentralized mix of province-specific welfare programs that generated substantial heterogeneity in the composition and timing of policy changes aimed at reducing the number of welfare recipients. Passage of The Canada Health and Social Transfer (CHST) in 1996, which implemented a block grant funding system and removed federal rules about how provinces manage their welfare systems, was a major event in this process of decentralization.[1] This paper seeks to exploit the statistical variation generated by these 10 natural experiments brought about by changes in provincial welfare policies to measure the effects of new reform strategies on welfare participation.[2] We use variation in the

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[1] A key aspect of CHST that differentiated the Canadian experience of welfare decentralization from the U.S.'s was that the US law (the Personal Responsibility and Work Opportunity Reconciliation Act, or PRWORA) mandated a specific set of new reform strategies—time limits and sanctions for non-compliance to work requirements—as federal law. In addition, states were constrained in their ability to lower welfare benefit levels and were required to have 25 percent of their caseload participating in work-related activity. Thus, while states were given freedom in other policy areas, such as earnings exemptions and diversion strategies, federal work participation mandates meant that similar sets of policy changes went into effect across the 50 states shortly after the passage of PRWORA in 1996. In contrast, Canada's decentralization had, at its core, no federally mandated initiatives specifically aimed at reducing welfare use or incentivizing work. This allowed for greater differences in the combinations of policy changes that were undertaken across provinces and substantial differences in their timing.

[2] Welfare refers to government programs that provide cash benefits to individuals with low incomes. In Canada, welfare is officially referred to as social assistance. Welfare participation is measured in this paper as the fraction of

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substance and implementation dates of provinces' mixes of new reform strategies to estimate these policies' effects on the rate of welfare participation, aggregated at the level of province-years, and estimated using province and year fixed effects, 1986 to 2005, while controlling for provincial-level differences in benefit levels, economic growth, unemployment, labor market policy variables, and demographic characteristics.

We classify policy tools for controlling welfare participation into two categories to differentiate the standard tools that have been studied extensively in the extant literature from four new reform strategies that were implemented during decentralization as provinces took greater control over the design and implementation of welfare policy. The label s*tandard tools* refers to benefits reductions and the tightening of eligibility requirements, which are perhaps the most direct way for governments to try reducing welfare use. Until 1993, differences among provinces' welfare policies were largely restricted to different benefit levels and eligibility requirements. In contrast, the label *new reform strategies* refers to four policy tools that emerged more recently in one or more provinces: work requirements with sanctions for non-compliance, diversion of would-be welfare recipients to alternative sources of support, earnings exemptions to encourage work, and time limits that cap the duration for which recipients can receive benefits.[3] The primary goal of this paper is to use the rich heterogeneity afforded by Canada's

a province's non-elderly adult population receiving welfare benefits in a given year. More detail on data sources and the definition of these variables appears in Section 2.

[3] The adjective "new" is slightly misleading in the case of earnings exemptions in Canada, since some provinces experimented with them decades earlier and all provinces had some form of earnings exemptions in place allowing welfare recipients who earned labor income to keep some positive fraction (relative to the extreme of a 100 percent tax of labor market earnings). The main reason for classifying earnings exemptions under the "new reform strategies" label is to follow convention based on welfare reform studies using US data. Prior to passage of

multiple natural experiments to measure the effect of new reform strategies on welfare participation.[4]

Effects of benefit levels and eligibility requirements on welfare participation have been studied extensively, although without coalescing to a consensus concerning whether these effects (in comparison with labor market conditions and exogenous macroeconomic shocks) are important determinants of welfare participation. Allen (1993) documents that differences in benefit levels and asset exemption levels among provinces have significant effects on welfare participation. Dooley's (1999) longitudinal study of single mothers similarly finds that benefit levels relative to labor market wages (together with controls for age and family structure) explain a large share of variation in welfare participation decisions among this important subpopulation. Christofides (2000) and Christofides, Stengos and Swidinsk (1997), however, argue that changes in wage rates and personal characteristics are perhaps more important than changes in benefit levels and the other welfare policy variables that they considered using two-equation models of labor supply and welfare participation. Finnie, Irvine and Sceviour (2004) similarly argue that individual attributes explain Canadians' decisions to take up welfare better than do changes in the standard tools of welfare reform. Klassen and Buchanan (1997) focus on eligibility

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PRWORA in 1996, labor market earnings of long term welfare participants in the U.S. were taxed at 100 percent, creating a strong disincentive to work. At least in the U.S. context, earnings exemptions can be regarded as one of the important new reform strategies put forward by advocates of welfare reform.

[4] As early as Gorlick and Brethour (1998), social scientists were documenting dramatic changes in Canada's welfare system and the concomitant introduction of new reform strategies (notably, work requirements). Since Gorlick and Brethour, a wide-ranging group of researchers from different disciplines and with distinct perspectives have contributed to documenting the heterogeneity and novelty of new reform strategies as defined in this paper (e.g., Morel, 2002; Wallace, Klein, and Reitsma-Street, 2006; Maxwell, 2009; Saulnier, 2009).

requirements and find that labor market conditions rather than policy variables drive welfare participation rates. Additional studies concerning benefit levels and eligibility requirements have contributed greatly to establishing empirical regularities linking these standard tools for controlling welfare participation to other important economic outcomes (Charette and Meng, 1994; Fortin, Lacroix and Drolet, 2004; Arnau, Fortin and Cremieux, 2005; Card and Hyslop, 2005; Card and Robins, 2005; Lemieux and Milligan, 2008).[5]

Turning now to new reform strategies, relatively little econometric analysis exploiting the valuable statistical variation afforded by heterogeneity in provinces' adoption of new policies has appeared.[6] One reason for this may be that the very heterogeneity that makes new reform strategies potentially rich with relevant information also presents a formidable challenge: How to code diverse laws, enforcement practices, and timing profiles in a concise, yet comprehensive manner that can be included as an explanatory variable in an otherwise standard econometric framework? This paper takes up the task of coding these new-to-Canada welfare reforms that appeared mostly in the 1990s and estimating their effects on welfare participation.

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[5] An overlapping set of questions about the determinants of welfare participation have been investigated extensively using US data (e.g., Blank, 2001, 2002; Acs, Phillips and Nelsen, 2005; Ribar, 2005). In the context of our focus on new reform strategies, the US literature on time limits, which is one of the toughest and most controversial of the new reform strategies, is particularly relevant (Grogger, Haider and Klerman, 2003; Grogger, 2004).

[6] Green and Warburton (2004) studied the effects of diversion policies using a randomized policy experiment in British Columbia and found no evidence of long-run effectiveness of this policy tool. Shannon (2009) coded Canadian provinces into categories that distinguish aggressive from non-aggressive reformers, but in the context of explaining labor supply decisions. Using US data, Danielson and Klerman (2008) coded the same four policies that we define as new reform strategies. The present study draws inspiration from these studies' coding techniques and their focus on new reform strategies, attempting to adapt these approaches to model Canadian welfare participation within a standard econometric framework.

Table 1 presents a more detailed view of the new reform strategies, their variegated combinations among provinces and heterogeneous dates of implementation. The information in Table 1 is the result of our attempts to assiduously collect source material from 10 provincial welfare agencies, and multiple other sources, summarizing new reform strategies (i.e., welfare policies other than benefit levels and eligibility requirements) put in place since 1986. Table 1 shows that many provinces pursued some type of new reform strategy, but that stringency of sanctions used to enforce work requirements and the aggressiveness of diversion tactics varied in important ways, as recorded in the column headings that distinguish *weak* from *strong* versions of work requirements and diversion. According to Table 1, three provinces stand out as relatively aggressive in implementing stringent combinations of new reform strategies: Alberta, British Columbia, and Ontario.[7] The econometric models of welfare participation at the heart of this paper include variables that code the information in Table 1 together with variables measuring benefit levels, eligibility requirements, labor market policy variables (i.e., minimum wage and unemployment benefits), macroeconomic shocks, and annual measures of province-specific demographic composition.

The major questions we attempt to address concern the effect of new reform strategies on rates of welfare participation relative to other frequently studied factors thought to influence welfare participation. The comparisons are threefold. First, we compare the effect of new reform strategies relative to the effect sizes of benefit levels and eligibility requirements in explaining reductions in welfare participation that took place from 1994 to 2005. New reform strategies turn out to be at least as important as benefit levels and eligibility requirements in

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[7] A detailed account of welfare policy in each province and source material used in coding the new reform strategies in Table 1 can be found in Appendix A ("An Overview of Canadian Welfare Reform").

explaining observed declines in welfare participation. Second, we quantify the effect size of new reform strategies relative to minimum wage and unemployment insurance benefits. New reform strategies turn out to be at least as important as welfare benefits levels, and at least an order of magnitude more important than eligibility requirements, in contributing to observed declines in welfare participation. Differences across provinces and over time in the real minimum wage had almost no effect. And, according to all the empirical models, declining unemployment benefits induced more people to participate in welfare (substituting out of less attractive unemployment benefits) all else equal. Finally, we compare effect sizes of new reform strategies against the good luck of random macroeconomic fluctuations (for which policy makers would have a more difficult time claiming responsibility) proxied here by real GDP growth, unemployment, and lags of both these variables. GDP growth has no statistically significant effects, but provinces' unemployment rates have powerful effects, accounting for a quarter to half ofthe decline in welfare participation.

The paper proceeds as follows. Section 2 describes patterns in welfare use in Canada at the national and provincial levels and presents data on benefits reductions, macroeconomic fluctuations, and new reform strategies as competing information sources for explaining the dramatic reductions in welfare use that nearly all observers agree took place from the mid 1990s through 2005. Section 2 also describes the methodology for classifying province-year combinations as having new reform strategies in effect. Section 3 presents the data and empirical models of welfare participation. Section 4 presents estimated results from these empirical models: those with province and year fixed effects, with different versions of the variable coding new reform strategies, and data-filtering techniques for extracting trends, conducting robustness checks, and identifying which among new reform strategies had the

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largest effects. The findings in Section 4 are intended to address the questions posed in the introduction concerning the relative magnitude of new reform strategies' effects relative to other factors influencing welfare use. Finally, Section 5 concludes with a discussion and interpretation of the empirical findings.[8] This document makes reference to numerous appendices documenting: data sources and institutional details used to code new reform strategies (Appendix A); supplementary descriptive statistics and empirical models (Appendix B, C, D, H1, H2, H3, NR, and R); and figures that guided certain modeling choices and interpretations of the quantitative findings (Appendix AG, HP1-HP4, P, and WB). These appendices are not intended for publication due to space considerations and are instead posted online.[9]

Section 2: Why Did Welfare Participation Fall in Canada?

Changes in Welfare Participation in Canada and its Provinces[10]

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[8] Contextualizing our findings is challenging given the divergence among previous findings. Previous studies that measure effects of new reform strategies in Canada or the U.S. have come to different conclusions. Hughes and McCuaig (2000) study programs that send welfare recipients to work as child care workers, providing cautionary evidence about difficult-to-anticipate challenges that new reform strategies may face.   In the U.S context, Ziliak, Figlio, Davis and Connolly's (2000) analysis of US state-level welfare caseloads attributes virtually all observed declines after 1996 to macroeconomic fluctuations rather than policy changes under the heading of welfare reform. Not every technique for measuring effect sizes for new policies produces the same answer, however, as Swann (2005), for example, reports rather strong evidence that work requirements and time limits lead to large declines in welfare use.

[9] http://www.utdallas.edu/~nberg/Berg_ARTICLES/APPENDICES-Berg-Gabel-2010-10-11.pdf

[10] The period study for the data and empirical models analyzed subsequently is the 20 years from 1986 to 2005. At the time of writing, Canada's National Council of Welfare had published welfare participation counts broken out by province only through 2005. Another transition that occurred around this time was the split of the CHST into the Canada Health Transfer (CHT) and the Canada Social Transfer (CST).

Figure 1 disaggregates welfare participation into time paths for each province, which vary considerably both in level and slope[11] Welfare participation reached a peak in all provinces between 1993 and 1997. The subsequent declines were nearly monotonic, although the levels and rates of decline were markedly different. Table 2 computes percentage declines in welfare participation by province, from 1994 (the year in which Canada's national rate of welfare participation peaked) to 2005. Despite heterogeneity among provinces' approaches to welfare reform emphasized earlier in Table 1, every province experienced large declines in welfare participation. Table 2 shows that Alberta declined by more than 66 percent while Newfoundland declined by less than 18 percent. Ontario had by far the largest percentage-point reduction, dropping a remarkable 8.6 percentage points.

Changes in Welfare Benefits

Table 3 shows percentage declines in real welfare benefits which occurred in nearly all provinces' formulas for paying benefits to the three most common kinds of households.[12] Each province has its own formula for mapping the household structure of a welfare-eligible individual into a benefit level. Household structure sometimes raises conundrums of classification, especially the designation "single." Following the National Council of Welfare's interpretation of this term, *single* refers to an adult living at an address with no other adults living

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[11] Welfare participation data from the National Council of Welfare (2003, 2006) is computed annually as the fraction of the non-elderly population in each province receiving welfare in March of a given year. See Appendix AG for nationally aggregated welfare participation overlaid with GDP growth and the unemployment rate.

[12] The percentage versus levels distinction matters qualitatively for some comparisons because benefit levels for single adults with no children are generally much smaller than benefit levels for single or coupled parents with dependent children. In provinces like British Columbia and Ontario, benefits for Single, No Child individuals were cut more than for Single, One Child households in percentage terms, but the same or less in dollar terms.

at the same address. By this definition, the label "single" provides no definitive information about marital- or relationship status, although one presumes it 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.

Some provinces such as British Columbia, Ontario and Saskatchewan reduced benefits fairly evenly across different household structures. Alberta, Manitoba, New Brunswick, and Prince Edward Island, on the other hand, cut benefits for childless welfare recipients (listed in Table 3 under the column labeled Single, No Child) by at least twice as much as for Single Parent, One Child households. Despite the overall trend of benefits *reductions*, Newfoundland raised real benefits for Single, No Child individuals by a remarkable 45 percent, while hardly adjusting real benefits for the other two household structures over the same 11-year period.[13]

Overall, these large declines in benefits show that the standard tool of benefit reductions was aggressively used. If benefit level reductions explained the entire decline in welfare participation, then we should be able to put variables measuring the new reform strategy

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[13] According to the National Council of Welfare, Newfoundland's unusual rise in benefits levels for the childless arose due to a shift between two rather extreme shifts in policy (NCW, 2003), and thanks to personal communication with D. Richard (February 9, 2010), Researcher and Policy Advisor at the National Council of Welfare. LexisNexis searches for news accounts of radical changes in welfare benefits in Newfoundland during this period did not uncover any stories in the local press about dramatic cuts, suggesting the possibility of a discrepancy between reported benefits levels and practice in the field. 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 Single, No Child individuals, reaching what is as of 2005 (and at the time of writing) the highest level for this household structure across all provinces.

variables side-by-side in a regression with fluctuating benefits as controls and expect the policy coefficient to be roughly zero. If, on the other hand, new reform strategies made a substantive difference in reducing welfare participation rates across Canada, then we should see large coefficients on this variable that codes the new reform strategies, even in the presence of the benefit levels controls.

The multiple household structures in Table 3 raises the question of which benefit levels to include as controls in the empirical model presented in the next section. The models we report subsequently use welfare benefits for Single Parent, One Child as a proxy for all fluctuations in benefit levels. As Table 3 shows, any scalar-valued proxy will be imperfect because benefit levels did not fluctuate uniformly among different household structures. 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 21 percent were single with at least one child, and 10 percent were coupled with at least one child. Based on representativeness of the population of Canadian welfare recipients, one could easily argue that it makes more sense to use benefit levels for Single, No Child households, or a weighted average. Two points argued in favor of our approach of using Single, One Child benefits, however. A 45 percent increase in benefits for childless welfare recipients (which coincided with every other province reducing benefits by 10 to 35 percent) makes Newfoundland a troublingly influential outlier. Pair-wise correlation between Single, No Child and Single, One Child benefits is 0.70 when Newfoundland is excluded (with 180 observations from 9 provinces observed over 20 years) and just 0.38 when included (with 200 observations). A second reason to focus on benefit levels for single parents is that this household type tends to have longer spells

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on welfare (Barrett and Cragg, 1998) and per-case costs are therefore much larger.[14] Appendix WB shows annual time paths of each province's welfare benefit levels for a Single Parent, One Child household, revealing nice variation across provinces and through time.

Changes in Eligibility Requirements

Eligibility requirements such as means tests, asset exemption limits, age restrictions on teenage recipients, and residency requirements are policy tools for influencing welfare participation rates.[15] Unfortunately, there are insufficient data to code the numerous dimensions in which provinces vary in their welfare eligibility requirements. As a second best, we use provinces' maximum liquid asset exemption levels expressed in 2007 Canadian dollars as a proxy for changes in eligibility rules. Applicants with liquid assets in excess of this dollar amount are not eligible for welfare. Compared with benefit levels, there is not nearly as much year-over-year change in the asset exemptions variable, although when changes do occur, they tend to be rather large.[16]

New Reform Strategies in the Provinces

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[14] In unreported runs of the empirical models introduced subsequently, we tried all three of these benefits levels individually as the single benefits proxy in the model and, in some runs, we included both Single, No Child and Coupled, Two Children benefits even though this specification suffers from the multicolinearity problem.

[15] One of the most well known adjustments in eligibility requirements came in 1987, when Ontario passed the "spouse in the house" rule that expanded eligibility for welfare by enabling unmarried, cohabiting 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 made newly eligible for welfare (Holden, 1987), which gives but one indication 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.

Despite the substantial variation in benefit levels and eligibility requirements, a case can be made based on documentary evidence (NCW, 1997; Gorlick and Brethour, 1998), that the real action in Canada in terms of welfare-related policy change was generated by provinces' experimentation with new welfare reform strategies (i.e., work requirements with sanctions, diversion, earnings exemptions, and time limits). Recall that Table 1 (discussed in the Introduction) summarizes new reform strategies put in place in various combinations and in different years.

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. Failure to comply can, in some province-years, result in sanctions. Provincial policies differ in terms of whether and how much a welfare participant loses for failing to comply with work requirements. Work requirements are classified as *Weak* if sanctions for non-compliance require forfeiting a fraction of the benefit payment (often $100 or less according to sanctions policies in provinces with *Weak* work requirements). Work requirements are considered *Strong* if welfare participants face losing 100 percent of the welfare benefits for non-compliance.[17] Another dimension of the stringency of work requirements described in the notes in Table 1 concerns how easy it is for recipients facing sanctions to appeal, and whether welfare case workers have discretion to not impose sanctions.

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[17] Newfoundland and Quebec (with the exception of the years 1990 through 1994) had work requirement policies with no sanctions to punish non-compliant participants, and are therefore coded as having no work requirement at all.

Diversion

The next policy tool coded in Table 1 as a new reform strategy is diversion, referring to policies that seek to reduce the number of potential welfare applicants who complete applications for welfare by diverting would-be welfare participants to tap other sources of income instead. The rationale for diversion is straightforward: to save the welfare system money over the long term by reducing the number of people who end up as long-term welfare participants, even if it incurs up-front costs. Table 1 classifies diversion as *Weak* if the policy is primarily an information campaign notifying would-be welfare applicants of work opportunities, their eligibility for other government programs (e.g., unemployment insurance), or spousal and/or family support that they are already entitled to collect (especially alimony and child support payments).[18] Diversion is considered *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 costs of clothing for a job interview; to buy a bus ticket to a neighboring province); demand that would-be applicants wait a week or more before completing the application; or require would-be applicants to liquidate all assets, move in with relatives, visit food banks, or engage in other activities as prerequisites that must be undertaken before the welfare application is complete. The coding in Table 1 does not require that a province engage in all of these to be classified as strong diversion as the footnotes in that table explain. Alberta (since 1993) and British Columbia (since 2002), for example, require most welfare applicants to automatically wait before a welfare application can be completed. For example, applicants in British Columbia

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[18] Another component of diversion policies is that welfare applicants are required to complete lengthy questionnaires and provide extensive documentation to apply for welfare, which raises the implicit cost of applying.

are required to document job search during a mandatory three-week waiting period before proceeding with an application and receiving the first welfare payment.

Earning Exemptions

The third policy tool coded in Table 3 as a new reform strategy is earnings exemptions. These are tax incentives that aim to encourage work among welfare participants by exempting some portion of labor market earnings from taxes. There are two parameters that define a province's earnings exemption policy. First, there is a threshold of earnings that is not taxed at all, typically C\$100 to C\$300 per month (in nominal dollars). The second parameter is the rate of taxation on labor earnings above this threshold. Table 1 classifies a province as having implemented earnings exemptions if it has *both* a non-zero earnings exemption threshold and a tax rate of less than 100 percent. This binary classification is an admittedly coarse measure, and we examine the effects of these parameters separately with a version of the welfare participation model in which the new reform strategies policy variable is unbundled into as fine-grained components as possible. Details of provincial earnings exemptions policies are described in Appendix A.

Time Limit

Finally, time limits refer to policies that stipulate a maximum duration for which benefits can be drawn. Only British Columbia has instituted time limits. Under British Columbia's time limits policy, a welfare participant can receive benefits for a maximum of two years out of every five-year period.[19]

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[19] In the U.S., time limits were first introduced under PRWORA. The federal law in the U.S. imposes a five-year lifetime limit on the receipt of welfare benefits, with some states having enacted lifetime limits as low as two years. British Columbia's revolving five-year window can therefore be thought of as a hybrid policy—not as strict as US

Mapping New Reform Strategies into the Policy Variable: NEWREFORM

Table 4 shows the mapping from the new reform strategies summarized in Table 1 into a policy variable representing province-year combinations in which new reform strategies were in effect to be used in subsequent econometric models. We construct four versions, beginning with the most restrictive definition of what it means for a province-year to have new reform strategies in effect, labeled NEWREFORM1, and then loosen the criteria gradually (i.e., number and stringency of policies in Table 1 that must be in place simultaneously for a province-year to be classified as having new reform strategies in effect), constructing successively more inclusive versions: NEWREFORM2, NEWREFORM3 and NEWREFORM4. All of these are indicator variables that "turn on" (from 0 to 1) to indicate province-year combinations in which criteria, specified in detail below, are met.

NEWREFORM 1 requires that a province-year has three or more reform policies from Table 1 simultaneously in effect, excluding weak work requirements and weak diversion. NEWREFORM1 is the main explanatory variable in the regression results reported below, and we feel that it best distinguishes the province-years where substantially novel policies were implemented (Alberta from 1993 on, British Columbia from 2002 on, and Ontario from 1996 on).[20] NEWREFORM2 defines new reform strategy province-years slightly more inclusively, indicating province-years with three or more reform policies (weak or strong) in effect.

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limits, but stricter than other Canadian provinces that have no limits on the length of time one can receive welfare benefits.

[20] This version of the policy variable also most closely tracks with the policy bundle that U.S. states are required to have in place under PRWORA. Thus, NEWREFORM1 can be regarded as an indicator for province-years in which US-style reforms were in effect. Unlike the US, however, NEWREFORM1 distinguishes sharply among provinces, since most province-years, even post-1996, are not indicated as having new reform strategies in effect.

NEWREFORM3 indicates province-years in which any form of work requirement was in effect. Finally, NEWREFORM4 is the crudest and most inclusive measure of new reform strategies, switching from 0 to 1 in all provinces in 1996 to mark Canada's federal enactment of the CHST, giving provinces new autonomy over welfare policy. NEWREFORM4 is crude in at least two ways, and provides a benchmark against which to see what the information added in constructing REFORM1 buys us in terms of effect size and variance explained. REFORM4 does not capture differences between provinces' post-1996 welfare reform policies, nor does it account for different dates of implementation across provinces.

Another potentially important sensitivity we were concerned about was whether, given a policy implemented in month $m \in \{1, 2, \ldots, 12\}$ of year t, it matters if we code this as occurring in year t or year $t +1$. We tried three approaches that turned out to have barely noticeable effects on estimated regression coefficients. The first approach was "aggressive coding" indicating 1 in the year of implementation (t) regardless of the month in which it began. Our "intermediate coding" approach assigned the value of 0 to the reform variables in years prior to t, a value of $m/12$ in year t, and a value of 1 in all years after t. Finally, the "conservative coding" approach assigned 1 to the reform variable in year $t +1$ and 0 prior to that. None of these variations in the coding of the policy variable had substantial effects, whether mid-year dates of implementation were considered to be in force retroactively from the beginning of the year, fractionally throughout the year, or only the following year.

Section 3: Data and Statistical 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*

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series published nearly every year from 1990 through 2008.[21] Provincial population data,

demographics, unemployment rates, real GDP, and unemployment insurance transfers[22] were

provided by numerous data files compiled by Statistics Canada.[23] Finally, minimum wage rates

were obtained from the *Minimum Wage Database* compiled by Human Resources and Skills

Development Canada (2009).

Summary Statistics

Table 5 presents summary statistics for variables used in subsequent regression models.

The number of observations is 200, resulting from 10 provinces observed over 20 years. The

dependent variable is welfare participation, measured as the fraction of the non-elderly

population counted as welfare participants in each province-year, labeled PARTICIPATION,

ranging from a minimum of 1.97 percent (Alberta in 2002 and 2005) to a maximum of 15.27

percent (Newfoundland in 1997). The macroeconomic variables UNEMPLOYMENT and

REALGDPGROWTH show a wide range of fluctuation, which is of course beneficial for the

precision of estimated regression coefficients. The empirical models will include lagged

versions of the two macroeconomic variables, not listed as separate rows in Table 5 because

lagged variables have nearly identical empirical and identical asymptotic distributions.

NEWREFORM1 indicates that 13 percent of province-years have new reform strategies in

effect, according to the most stringent criteria matching welfare policy in the U.S. after 1996.

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[21] Unfortunately, we were not able to find usable data across all province-years in our sample measuring the
proportion of welfare participants who are disabled.

[22] Canadian data sources use the term "employment insurance" in place of "unemployment insurance."

[23] 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).

The gradual loosening of the criteria used to define variations on the coding of our main policy variable can be seen in the increasing coverage of province-years: 13, 24, 42 and 49 percent.

The variable measuring variation in welfare benefits in Table 5 is labeled logBENEFITS_SINGLE_ONECHILD and ranges from 9.46 to 10.00, slightly more than 50 log-approximated percentage points. The variable logASSET_THRESH proxies for provinces' different eligibility requirements, with higher asset thresholds indicating more lenient eligibility rules. Its range of variation of 2.28 (= 9.35-7.07) is substantially larger than for the benefits variable, translating to approximately 228 percentage points relative to the mean. Provincial minimum wage rates have been deflated to real terms and logged to form the variable logMINWAGE, with a range of variation similar to that of the welfare benefits variable. The variable logUNEMP_INS is the annual unemployment insurance transfer for a non-elderly out-of-work Canadian in a particular province-year (assuming an unemployed worker draws the benefit for an entire 12 months) deflated to constant 2007 dollars and then logged.

The proportion of the non-elderly population who are single parents is measured by the variable SINGLEPARENTS, presumably controlling for additional information regarding exogenous differences in demand for welfare. The interprovincial rate of migration (i.e., the net number of people moving into each province as a fraction of the destination province's non-elderly population) is given by MIGRATION, while education outcomes are approximated by high school dropout rates, labeled DROPOUT. A province with more formal education has, one presumes, more skills and is therefore less likely to require welfare (Coelli, Green and Warburton, 2007). The variable *ELDERLY* records the ratio of the number of over-65 to 65-or-under residents in each province-year. Two countervailing effects are possible: a province with a greater than average ratio of elderly residents might provide additional childcare services

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enabling working-age people with children to work more, or the elderly might represent another demand on the time of working-age people, reducing the chance of labor market participation (and increasing the chance of welfare participation). The number of non-permanent residents per non-elderly person in a given province-year is measured by NONPERM_RESIDENTS, which includes people claiming refugee status; people holding a study, work or Minister's permit; and/or a non-Canadian-born dependant of a non-permanent resident.[24]

Empirical Models

We build up the empirical models successively, beginning with a relatively small, exclusively macroeconomic benchmark model consisting of real GDP growth and the unemployment rate—contemporaneously and with two lags each—for a total of 2x3 = 6 variables in addition to a constant:

$$\text{Model A:} \qquad Y_{it} = \alpha + M_{it}'\mu + \varepsilon_{it},$$

where Y_{it} represents the welfare participation rate in province i at time t; M_{it} represents the 6x1 vector of province-specific GDP growth and unemployment with two lags (using similar indexing throughout: i indicating provinces and t indicating time periods, $i = 1,\ldots,10$; $t = 1,\ldots,20$); M_{it}' represents the transpose of M_{it}; μ is a 6x1 vector of coefficients on the macroeconomic 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.

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[24] Appendix R ranks the provinces according to each of the variables listed in Table 5, confirming several stereotypes and generating surprises as well. Appendix V provides a variables list with detailed descriptions of all variables in Table 5.

Next, we include the main explanatory variable, NEWREFORM1$_{it}$, which captures between-province and intertemporal variation in new reform strategies. We will adopt an abuse of notation by specifying models that re-use Greek symbols which should be demarcated with distinct symbols. This elision of substantive differences (i.e., the fact that error terms and coefficients in different models are distinct mathematical objects) aids in seeing the construction of the model. Model B (with macro variables and new reform strategies) is as follows:

Model B: $\quad Y_{it} = \alpha + M_{it}'\mu + \text{NEWREFORM1}_{it}\,\rho + \varepsilon_{it},$

where ρ is a scalar valued coefficient on NEWREFORM1, and all other symbols represent analogously defined quantities although, of course, quantitatively distinct from previous and future models that re-use symbols.

Model C adds to Model B four additional policy variables denoted by the 4x1 vector P$_{it}$, which contains: logASSET_THRESH$_{it}$, logBENEFITS_SINGLE_ONECHILD$_{it}$, logMINWAGE$_{it}$ and logUNEMP_INS $_{it}$:

Model C: $\quad Y_{it} = \alpha + M_{it}'\mu + \text{NEWREFORM1}_{it}\,\rho + P_{it}'\pi + \varepsilon_{it},$

where π is a 4x1 vector of coefficients measuring the expected change in welfare participation from a one-unit change in a policy variable.

Next, we add five pieces of information about the demographic composition of each province-year, denoted by the 5x1 vector D$_{it}$, which stacks the variables: SINGLEPARENTS$_{it}$, MIGRATION$_{it}$, DROPOUT$_{it}$, ELDERLY$_{it}$, and NONPERM_RESIDENTS$_{it}$:

Model D: $\quad Y_{it} = \alpha + M_{it}'\mu + \text{NEWREFORM1}_{it}\,\rho + P_{it}'\pi + D_{it}\kappa + \varepsilon_{it},$

where κ is a 5x1 vector of coefficients measuring the effect on welfare participation of a one-unit change in demographic composition.

We construct a set of province fixed effects, denoted L_{it} (for location) and coded as a 9x1 vector of indicator variables for all provinces other than Alberta (which, as the province with the largest percent reduction in welfare participation, serves as the left-out reference class). The fixed effect indicator variables are multiplied by the corresponding vector of coefficients λ, the product of which can be added to all previous models (labeled "+FE" for fixed effects) to control for province-specific differences not captured so far. For example, the model D+FE refers to:

Model D+FE: $Y_{it} = \alpha + M_{it}'\mu + NEWREFORM1_{it}\,\rho + P_{it}'\pi + D_{it}'\kappa + L_{it}'\lambda + \varepsilon_{it}$,

Finally, a 19x1 vector of year-specific fixed effects denoted T_{it} (with year 1 left out as the reference class) is multiplied with the corresponding 19x1 vector of constants, τ, which measure an arbitrary time trend common across all provinces, the product of which is added to all four models (labeled "+FE+YR" for province and year fixed effects. Thus, the fully encompassing model with all regressors, province and year fixed effects is:

Model D+FE+YR: $Y_{it} = \alpha + M_{it}'\mu + NEWREFORM1_{it}\,\rho + P_{it}'\pi + D_{it}'\kappa + L_{it}'\lambda + T_{it}'\tau + \varepsilon_{it}$.

The standard errors of estimated coefficients in these models are computed using Arellano's (1987) clustered covariance matrix (CCM) technique, which assumes that ε_{it} is uncorrelated across provinces but autocorrelated within province.[25] This estimator produces noticeably larger standard errors that deflate t statistics and make it more difficult for the model to indicate 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, substantively (because of large effect sizes) and statistically (because of small standard errors). Under classical assumptions for

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

a panel model based on N units observed for T periods and with K regressors, the degrees of

freedom for t statistics is $NT - K - 1$.[26]

Section 4: Regression Results

Table 6 presents estimated coefficients and t statistics for Models A+FE+YR through

D+FE+YR (which include both province and year fixed effects). Model A+FE+YR shows the

macroeconomic benchmark model with only unemployment and real GDP (and 2 lags each) in

addition fixed effects on the right hand side, which produces an R-squared of 87.0. Model

A+FE+YR's coefficients imply that, if unemployment went up by one percentage point for one

year and then returned to average, then welfare participation would be expected to rise by 0.46

percentage points contemporaneously, rise by 0.61 (= 0.46 + 0.15) after one year (assuming that

unemployment returned to its mean after one year), and then rise by 0.74 after two years (= 0.46

+ 0.15 + 0.13). This implies a roughly three-quarter percentage point rise in welfare participation

predicted within 2 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 one

percentage point increase in GDP growth, welfare participation is expected to fall by 0.05

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[26] Arellano's (1987) method is appropriate when $N > T$. For the case of the data considered in this paper where N is
fixed and $T > N$, 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 6 and 7 (presented
in the next section) depends on the approach taken. Under classical assumptions of a t distribution with 200-(9+19-
15)-1=156 degrees of freedom (based on 9 province fixed effects, 19 year fixed effects, and 15 other regressors), 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.

percentage points within two years. Converting the effects of macroeconomic variables to head counts (from a base population of 1,663,000 Canadians who were on welfare in 2005, or 6.1 percent of Canada's non-elderly population), a 1 point increase in the rate of unemployment in 2005 implies that approximately 202,000 Canadians would become welfare participants by the end of 2007, and a 1 percentage point increase in GDP growth implies an expected decline of approximately 14,000 Canadians exiting the welfare program within two years. Only contemporaneous UNEMPLOYMENT is significant at the 95 percent confidence level. (See Appendices C and D for estimated results based on Models A through D and Models A+FE through D+FE.)

Model B+FE+YR introduces NEWREFORM1 (which measures province-years in which new reform strategies were in full effect). Controlling for macroeconomic factors, Model B+FE+RY suggests that the enactment of new reform strategies reduced welfare participation by 2.16 percentage points, with a large t value. Relative to the unconditional mean welfare participation rate of 8.97 percent (averaging across province-years, not weighted by population), new reform strategies reduced welfare participation by 24.0 percent.

Model C+FE+YR adds other sources of information as competing explanations for the observed declines in welfare participation. Controlling for macroeconomic factors and other policy variables (i.e., welfare benefit levels, asset exemption levels, the minimum wage, and unemployment benefits), Model C+FE+YR produces nearly as large an effect of new reform strategies on welfare participation, but its t statistic of 1.7 is no longer statistically significant using Hansen's recommended 9 degrees of freedom. The effect size is economically significant, translating into a 21 percent reduction and hundreds of thousands of Canadians prevented from participating in welfare.

As Table 6 shows, Model D+FE+YR adds demographic controls. Contrary to what one might expect, the fraction of single parents—as a source of inter-province variation in the demand for welfare—as well as migratory population flows does not noticeably reduce the effect size of NEWREFORM1. The effect of new reform strategies on expected welfare participation remains economically significant at -1.91 percentage points but, again, with statistical precision that depends on one's interpretation of the t statistic whose magnitude is 1.7 (with p-value 0.12, or 88 percent confidence, under the assumption of a t distribution with 9 degrees of freedom).

Table 7 presents regression coefficients on four different versions of the variable that codes whether new reform strategies were in effect. Models B through D are variations on the inclusion of additional policy variables and demographic controls. Table 7 facilitates a comparison policy variation coded in NEWREFORM1 with successively more inclusive (i.e., less demanding) criteria for a province-year to be counted as having new reform strategies in place. We estimate variations of models B, C and D using four versions of the policy variable: NEWREFORM1, NEWREFORM2, NEWREFORM3 and NEWREFORM4. With three models that vary which other regressors are included (B, C and D); three fixed effects configurations (no fixed effects; province fixed effects, labeled "+FE"; and province-plus-year-fixed effects, labeled "+FE+YR"), a total of 3x4x3=36 coefficients and their t statistics are presented.

With the full set of control variables (labeled in Table 7 as Variations on Model D), province-years with new reform strategies in effect are associated with a reduction in welfare participation of somewhere between 1.91 and 2.72 percentage points when measured in the most restrictive definition (i.e., as NEWREFORM1). Looking only at Alberta, British Columbia, and Ontario, a 2-percentage-point reduction in welfare participation (holding constant all other macroeconomic and policy variables) would imply that these provinces' new reform strategies

prevented up to 344,000 Canadians per year from participating in the welfare system. The

magnitudes and, to a lesser extent, the statistical significance of estimated coefficients on new

reform strategies shrink as progressively coarser proxies are used (NEWREFORM2 through

NEWREFOR4). This suggests that the stringency of implementation and specificity of place and

time coded in NEWREFORM1 contain important information about the drivers of declines in

welfare participation.

New Reform Strategies' Contribution to Observed Declines in Welfare Participation

Table 8 presents calculations that facilitate a comparison of the contributions of different

policy tools in explaining the observed decline in welfare participation rates, analogous to a table

published by Council of Economic Advisors (1999) about the role of US policies in explaining

post-1996 declines in US welfare participation.   The first column shows the estimated

coefficients from Models D, D+FE and D+FE+YR. The second column shows the change in the

province-population-weighted national average of the right-hand-side factors between 1994

(when the national participation rate was at its maximum) and 2005 (when participation rates

have largely reached their lowest levels in decades). The third column shows the expected

change in the rate of welfare participation since 1994 based on the observed change in one right-

hand-side factor at a time, computed as the product (or sums of products) of the coefficient in the

first column and "change in x" listed in the second column. The Demographics factor depends

on five coefficients and changes in x variables, and only the sum of these five products are

reported in the third column of Table 8. The fourth column translates expected declines into

counts of the expected number of Canadians not receiving welfare each year attributable to a

one-factor change equal to that which was actually observed 1994-2005. The fifth column of

Table 8 divides the third column (expected change in welfare participation per factor) by the

observed -6.4 percentage point decline in Canada's welfare participation rate (-6.4 = 6.1 percent in 2005 minus 12.5 percent in 1994) to compute relative percentages of the observed decline attributable to different policy tools.

The per-factor attribution of expected percentage declines—to macroeconomic variables, new reform strategies, standard tools for controlling welfare participation, labor market policy tools, and demographic factors—attempts to provide more finely differentiated evidence that addresses the frequently discussed question: following an observed decline in participation rates, was it policy, the macroeconomy, or something else? Table 8 indicates that, depending on the model, the policies pursued by new reform users explain 16 to 23 percent of the decline in welfare participation during this period. Declines in the unemployment rate that occurred between 1994 and 2005 explain 26 to 39 percent when only contemporaneous unemployment is in the model, and 43 to 61 percent of the decline in welfare participation in the contemporaneous+two-lag specification. Overall, it appears that reductions in the unemployment rate played the largest role during this period but that, among the five policy tools in the encompassing models with a full set of right-hand-side variables, new reform strategies had by far the largest effect size.[27] Although the percentage decline in participation and absolute number of welfare recipients is large and clearly economically significant, the relative effect size

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[27] In Model D+FE+YR, coefficients on welfare benefits, eligibility requirements, the minimum wage, and unemployment benefits were statistically insignificant , even under conventional assumptions about the distribution of the model's t statistics.   Even in Models D and D+FE, as shown in Appendices C and D, only unemployment benefits were statistically significant. By contrast, across these various models, the variable NEWREFORM1 was statistically significant at the 90 percent confidence level, or better.

of new reform strategies vis-à-vis the unemployment rate is considerably smaller than effects found for similar reform initiatives in the U.S.[28]

Which Among New Reform Strategies is Important?

Table 9 summarizes three alternative specifications similar to Model D, D+FE and D+FE+YR, except that NEWREFORM1 is unbundled into five indicator variables corresponding to its policy-tool components.[29] These are labeled D', D'+FE and D'+FE+YR. Work requirements are coded as strong and weak versions, labeled WORK_STRONG and WORK_WEAK. And earnings exemptions to incentivize work among welfare recipients is unbundled into its two respective components: the threshold defining how much labor market earnings are tax-free (labeled as the variable logEARNINGS_THRESH), and the tax rate for earnings above this threshold (EARNINGS_TAX). The disaggregated policy effects in Table 9 point squarely to work requirements with strong sanctions as being associated with the largest reductions in welfare participation. Although TIMELIMITS is associated with a larger reduction in Model D', the inclusion of province-specific fixed effects makes it disappear, while the effects of WORK_STRONG survives all model specifications.

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[28] Council of Economic Advisors (1999), for instance, finds that PRWORA accounted for about 36 percent of the decline in welfare participation between 1996 and 1998, while the unemployment rate accounted for but 8 percent. This is possibly due to the much narrower time period, in contrast to the 13-year period of decline examined here. Alternatively, the welfare policy reforms in the US may have been more comprehensive relative to the policies they replaced, compared to the new reform strategies of even the most aggressive reformers in Canada.

[29] The timing of diversion policies was highly correlated with strong work requirements, leading to unstable results. Diversion was dropped from the unbundled regression models in Table 9. Therefore the variable WORK_STRONG should be interpreted as a combination of strong work requirements and diversion, since the data do not contain enough independent variation in these two components to differentiate their effects. See Appendix NR for the summary statistics of these individual new reform strategies.

Sensitivity to Alternative Model Specifications

A number of alternative model specifications were estimated to check the robustness of the findings reported so far. The first robustness check concerns our main independent variable. As shown in Table 7, the different measures of new reform strategies indicate that NEWREFORM1 produced the largest and most significant effects. Table 9 shows that among all the new reform strategies considered, it was work requirements with strong sanctions that made most of the difference. Another robustness check on the stability of the main coefficient of interest was to include alternative proxies for benefit levels. Recalling from Table 3 that benefit levels are available by province for two other household structures, we re-ran our models to see if these alternative benefit measures would make the new reform strategies coefficient shrink in magnitude. We observed no such shrinkage of change in statistical significance.

Finally, because a time series with a persistent long-run trend can lead to statistical anomalies that overstate statistical significance, we adopted the Hodrick-Prescott (HP) filtering technique, which separates a time series into a trend and residuals (Hodrick and Prescott, 1997). We constructed HP-filtered versions of each province's welfare participation time series, as well as all non-binary variables on the right-hand side of the model, and re-estimated the models using the HP trends. The HP trends correlate highly with the original unfiltered time series (as one can easily see in the Figures showing HP trends and residual time series in Appendix HP4). It is not surprising, therefore, that the results of regressing the HP trend in PARTICIPATION using province and year fixed effects were nearly identical to those reported in Table 6. See Appendix H1 for more details. The coefficients in models with HP trend as the dependent variable measure effects on the long-run components of welfare participation apart from short-run cyclical variation. We also ran models using the zero-mean HP residuals to see if the policy

variables had interesting effects on the short-run cyclical component (according to the HP filter). The results are contained in Appendices H2 and H3.

Section 5: Discussion and Interpretation

This paper contributes a new measure of the changes in welfare policy that appeared in Canada in the 1990s based on province-level data collected from a variety of administrative sources. These new reform strategies include work requirements with sanctions, diversion, earnings exemptions, and time limits. It appears that new reform strategies played a larger role than other policy variables in reducing welfare participation since the mid 1990s. Improving labor market conditions as measured by provinces' declining unemployment rates, however, accounted for (depending on the empirical model through which the data are viewed) roughly two to three times more reduction in welfare participation relative to reductions resulting from the implementation of new reform strategies. The empirical strategy in this paper finely differentiates among policy tools that until now have not been included in a single model of welfare participation. Perhaps the most novel comparison to emerge from this fine-grained analysis of welfare policy is that the effect of new reform strategies is large relative to eligibility requirements and benefit levels, which have received more attention from empirical researchers in the past. Finally, we find some evidence that, among the new policy tools that provinces experimented with since the 1990s, work requirements with strong sanctions have the largest and most robust effects on welfare participation.

To our knowledge, this is the first study to collect ministerial source information for all provinces to construct a welfare reform measure that encodes the new and oftentimes more stringent reform strategies that appeared in Canadian provinces since the 1990s. This study is

also unusual in comparing the relative effect size of particular welfare reform tools considered side-by-side in a multivariate environment with macroeconomic variables, labor market policy tools, and other welfare reform tools. This econometric test sets up a "horse race" among four competing sources of variation, allowing the data to decide which effect sizes are relatively large.

One limitation of our approach relative to the micro-data studies mentioned earlier is of course the information lost in province-level aggregation. Estimating new reform strategies' effects on particular subpopulations such as immigrants (cf., Baker and Benjamin, 1995), or differences in lengths of welfare spells between childless welfare recipients versus parents (cf., Barrett and Cragg,1998) requires micro-level data. Our data, aggregated at the provincial level, do contain reasonably good controls for the demographic composition of provinces, although province-level data cannot tell us all that we would like to know. This work will hopefully motivate further statistical investigations using micro data and longitudinal data to examine how these policies influenced welfare participation among different subpopulations.

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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 - Dec2001	[9]Jan 2002 -	[12]Jan 1996 - Dec2001	[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, 1992a). 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 suggests 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, 2008).

[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

Province	1994** Participation Rate	2005 Participation Rate	Change in Percentage Points	Percentage Change
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 Structure*

Province	*Common Household Structures*		
	Single, No Child	Single Parent, One Child	Coupled, Two Children
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 "single" person to be married, unmarried, with a 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 single adults with no children; 21 percent were single adults with at least one child; and about 10 percent were couples with dependent children (HRSDC, 2006). Finally, although the three household structures cover most welfare participants, they are not exhausted and should be treated as representative categories.

Table 4: Four Versions of NEWREFORM, the Main Explanatory Policy Variable Indicating Province-Specific Dates of Implementation

Province	NEWREFORM1	NEWREFORM2	NEWREFORM3	NEWREFORM4
Alberta	Mar 1993 -	Mar 1993 -	Jan 1991 -	Apr 1996 -
British Columbia	Jan 2002 -	Jan 2002 -	Jan 1996 -	Apr 1996 -
Manitoba			May 1996 -	Apr 1996 -
New Brunswick			May 1995 -	Apr 1996 -
Newfoundland				Apr 1996 -
Nova Scotia			Aug 2001 -	Apr 1996 -
Ontario	Sep 1996 -	Sep 1996 -	Sep 1996 -	Apr 1996 -
Prince Edward Island		Jun 1995 -	Jun 1995 -	Apr 1996 -
Quebec			Jan 1990 -Sep 1994	Apr 1996 -
Saskatchewan		May 2001-	Jun 1997-	Apr 1996 -

*NEWREFORM1 adopts the strictest and narrowest definition of a new NEWREFORM user, requiring that a province has three or more NEWREFORM policies from Table 1 in place, excluding weak work requirements or weak diversion, in a given year. NEWREFORM2 defines NEWREFORM slightly more inclusively, counting provinces that have three or more NEWREFORM policies in place, weak or strong, in the same year. NEWREFORM3 includes provinces that have adopted any form of work requirement. NEWREFORM4, the crudest and most inclusive measure, simply turns on all province indicators in 1996 marking Canada's federal enactment of the CHST. This instrument is crude in two ways: it does not distinguish among provinces' differing policy approaches to welfare NEWREFORM, and it does not account for different timing of policy implementation across the provinces.

Table 5: Summary Statistics (N = 200*)

Variables**	Min	Mean	Median	Max	Std Dev	Between-Province/ Total Variance***
*Dependent Variable****						
PARTICIPATION	1.97	8.97	8.94	15.27	2.74	0.73
*Macroeconomic Variables*****						
UNEMPLOYMENT	3.90	10.11	9.55	20.10	3.74	0.95
REALGDPGROWTH	-4.65	2.53	0.00	15.60	2.48	0.20
*Policy Variables******						
NEWREFORM1	0.00	0.13	0.00	1.00	0.34	0.70
NEWREFORM2	0.00	0.24	0.00	1.00	0.42	0.61
NEWREFORM3	0.00	0.42	0.00	1.00	0.49	0.43
NEWREFORM4	0.00	0.49	0.38	1.00	0.49	0.00
logBENEFITS_SINGLE_ONECHILD	9.46	9.64	9.64	10.00	0.10	0.71
logASSET_THRESH	7.07	8.16	8.15	9.35	0.53	0.80
logMINWAGE	1.76	1.94	1.93	2.18	0.09	0.82
logUNEMP_INS	5.62	6.70	6.66	7.92	0.59	0.96
Demographic Variables						
SINGLEPARENTS	4.00	6.68	6.72	9.20	0.78	0.33
MIGRATION	-2.01	-0.16	-0.14	1.55	0.55	0.79
DROPOUT	7.10	13.64	13.45	23.04	3.53	0.43
ELDERLY	8.85	13.37	13.69	16.04	1.55	0.99
NONPERM_RESIDENTS	0.27	2.72	2.13	10.28	1.84	0.92

*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 some versions of the model are not presented here. Inclusion of these dummy variables is indicated in the presentation of regression results.

***This measure refers to the fraction of each variable's sample variance accounted for by between-province variation rather than within-province variation over time. Most of these between-province variation rates are greater than 0.50 and sometimes close to 1, indicating that, for those variables, differences between provinces tend to be greater than fluctuations through time.

****PARTICIPATION is the fraction of a province's under-65 population 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) and 15.27 (in Newfoundland). We also experimented with transformations such as the natural logarithm and even a scaled arctan transformation mapping the unit interval to the entire unbounded real line. These transformations, however, led to greater asymmetry (i.e., greater skewness) in the empirical distribution, which increases the influence of observations in the tail of the distribution. Thus, the raw participation rate was the best measure of PARTICIPATION to use as our dependent variable in the analysis. See Appendix P for a more detailed analysis.

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

******It surprises some observers that, in Canada, single adults with no children (Single, No Child) are eligible for welfare. Childless singles comprise about 61 percent of all Canadian adults on welfare in a given year. However, most of the longer-term and therefore most expensive welfare cases are families with dependent children (single or coupled). To represent benefit levels for each province and in each year, we chose benefit levels for a single parent with one child (Single Parent, One Child). This household structure, or family type, represents about 21 percent of all adults on welfare in a given year. Excluding the province of Newfoundland (whose benefits levels for a Single, No Child is an extreme outlier possibly resulting from errors made in data reporting), the pair wise correlation between benefit levels for a Single Adult, No Child and Single Parent, One Child is 70.0 percent. As a result of this large overlapping variation, the Single Parent, One Child welfare benefit measure in our empirical models serves as a good single-number proxy for benefit fluctuations in general.

Table 6: Regression Results, Province and Year Fixed Effects

Variables	*Estimated coefficients and absolute value t statistics for* Models:							
	A+FE+YR	|t|	B+FE+YR	|t|	C+FE+YR	|t|	D+FE+YR	|t|
Macroeconomic Variables								
UNEMPLOYMENT	0.46	3.2	0.45	3.6	0.42	3.0	0.46	2.6
UNEMPLOYMENT_{t-1}	0.15	1.0	0.24	1.8	0.22	2.2	0.22	2.3
UNEMPLOYMENT_{t-2}	0.13	0.8	0.05	0.3	0.14	0.9	0.08	0.5
REALGDPGROWTH	0.00	0.0	0.02	0.9	0.01	0.5	-0.01	0.3
REALGDPGROWTH_{t-1}	-0.02	0.4	-0.01	0.2	-0.01	0.5	-0.03	1.3
REALGDPGROWTH_{t-2}	-0.03	0.5	-0.02	0.3	-0.01	0.3	-0.03	0.7
Policy Variables								
NEWREFORM1			-2.16	3.2	-1.92	1.7	-1.91	1.7
logBENEFITS_SINGLE_ONECHILD					3.28	0.7	3.79	0.9
logASSET_THRESH					-0.40	0.8	-0.27	0.6
logMINWAGE					2.73	0.8	2.66	0.8
logUNEMP_INS					-0.88	0.5	-1.29	0.8
Demographic Variables								
SINGLEPARENTS							0.13	0.7
MIGRATION							0.16	0.4
DROPOUT							-0.06	0.6
ELDERLY							0.01	0.0
NONPERM_RESIDENTS							-0.19	2.2
Constant	-0.09	0.0	0.85	0.4	-27.06	0.5	-31.25	0.7
R-Squared	87.0		90.0		90.8		91.3	

Table 7: Estimated Coefficients on NEWREFORM with Alternate Model Specifications

version of policy variable and inclusion of fixed effects*	variations of models B, C and D					
	Variations on Model B	|t|	Variations on Model C	|t|	Variations on Model D	|t|
NEWREFORM1	-2.27	1.8	-3.06	3.8	-2.72	2.9
NEWREFORM1+FE	-1.56	3.0	-1.79	2.2	-1.88	2.4
NEWREFORM1+FE+YR**	-2.16	3.2	-1.92	1.7	-1.91	1.7
NEWREFORM2	-2.38	3.4	-2.37	3.8	-2.49	4.3
NEWREFORM2+FE	-1.03	2.4	-0.64	0.9	-1.22	2.0
NEWREFORM2+FE+YR	-1.66	2.4	-1.23	1.6	-1.16	1.7
NEWREFORM3	-1.48	3.8	-1.21	3.1	-1.45	1.9
NEWREFORM3+FE	-0.22	0.7	-0.13	0.2	-0.63	1.1
NEWREFORM3+FE+YR	-1.15	2.2	-0.78	1.6	-0.89	1.9
NEWREFORM4	-0.41	1.0	-0.61	1.3	-1.29	1.4
NEWREFORM4+FE	0.65	1.2	0.34	0.4	-0.87	1.2
NEWREFORM4+FE+YR	-0.96	1.4	-0.37	0.3	2.21	1.7

*All coefficients in this table are based on versions of Models B, C and D. The verison label with no mention of fixed effects refer to models with no province or year fixed effects. Versions with the label "+FE" have province fixed effects. Versions with the label "+FE+YR" have both province and year fixed effects. The four versions of the policy variable measuring new reform strategies range from the most stringent or restrictive definition (NEWREFORM1) to the most inclusive definition (NEWREFORM4) for coding province-years in which new reform strategies are in effect.

**This row repeats the coefficients reported in Table 6 for convenience in comparing effect sizes.

Table 8: Per-Factor Contribution* to Observed Declines in Welfare Participation, 1994-2005

Factor	Estimated Coefficient	Change in x from 1994 to 2005	Expected Change in Welfare Participation from 1994 to 2005, Per Factor	Expected Number of Canadians Prevented From Collecting Welfare Per Year, Per Factor	Percentage Contribution to Explaining the Observed Decline in Welfare Participation 1994-2005
OLS					
Contemporaneous Unemployment	0.55	-3.656	-2.02	-551,228	31.4
Unemployment with Two Lags	0.91	-3.656	-3.32	-908,054	51.7
GDP Growth with Two Lags	-0.22	-0.017	0.00	1,021	-0.1
New Reform Strategies	-2.72	0.534	-1.45	-397,368	22.6
Benefits	3.70	-0.204	-0.75	-205,481	11.7
Asset Exemptions	0.42	-0.720	-0.30	-82,466	4.7
Real Minimum Wage	4.30	-0.021	-0.09	-24,379	1.4
Unemployment Insurance Benefits	-3.12	-0.496	1.54	421,970	-24.0
Demographics**	.	.	0.08	21,767	-1.2
+ Province FE					
Contemporaneous Unemployment	0.70	-3.656	-2.54	-694,883	39.6
Unemployment with Two Lags	1.07	-3.656	-3.91	-1,066,869	60.7
GDP Growth with Two Lags	-0.14	-0.017	0.00	649	0.0
New Reform Strategies	-1.88	0.534	-1.01	-275,161	15.7
Benefits	6.18	-0.204	-1.26	-343,312	19.5
Asset Exemptions	0.28	-0.720	-0.20	-55,084	3.1
Real Minimum Wage	2.24	-0.021	-0.05	-12,710	0.7
Unemployment Insurance Benefits	-2.40	-0.496	1.19	324,721	-18.5
Demographics**	.	.	0.18	49,222	-2.8
+ Province + Year FE					
Contemporaneous Unemployment	0.46	-3.656	-1.68	-458,486	26.1
Unemployment with Two Lags	0.76	-3.656	-2.77	-756,732	43.1
GDP Growth with Two Lags	-0.07	-0.017	0.00	307	0.0
New Reform Strategies	-1.91	0.534	-1.02	-279,493	15.9
Benefits	3.79	-0.204	-0.77	-210,662	12.0
Asset Exemptions	-0.27	-0.720	0.19	52,254	-3.0
Real Minimum Wage	2.66	-0.021	-0.06	-15,083	0.9
Unemployment Insurance Benefits	-1.29	-0.496	0.64	174,836	-10.0
Demographics**	.	.	-0.05	-13,768	0.8

* 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 decline in welfare participation in that same period, which was -6.4 percentage points. The first column repeats (or, in the case of the factors labeled Longrun Unemployment and Longrun GDP Growth and Demographics, computes a simple sum of) coefficients from the respective regression models. These coefficients are interpreted, as always, 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 variable, generically referred to in the second column label as "x." The second column 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 (defined by NEWREFORM1) minus the fraction of Canadians in 1994 living in a province with new reform strategies in place. The third is the product of the first two columns, providing the expected decline in the annual rate of welfare participation from the coefficient(s) and change per right-hand-side factor. In the case of the factor Demographics, there are five demographic coefficients and five changes in x, which are multiplied with their respective coefficients and then summed to produce the very small expected declines in welfare participation in the hundredths of percentage points. The expected number of Canadians per year, per factor, prevented from going onto welfare because of each factor is the expected decline in welfare participation translated to a headcount in the 2005 population age 65 and under. Finally, the contribution to explaining the observed decline of -6.4 percentage points, attributable to each factor, is the expected decline divided by -6.4. A negative contribution implies that the factor changed in a direction which, all else equal, would have increased welfare participation.

**The five variables that comprise the Demographics factor are: SINGLEPARENTS, MIGRATION, DROPOUT, ELDERLY, NONPERM_RESIDENTS.

Table 9: Effects of Individual New Reform Strategies on Welfare Participation (Regression Models With Disaggregated Version of New Reform Strategies)

|			Estimated Coefficients and Absolute Value t statistics for		
Variable	Model D' no FE	|t|	D'+ Province FE	|t|	D'+ Province + Year FE	|t|
New Reform Strategy						
WORK_STRONG	-2.20	2.3	-2.05	1.8	2.35	1.8
WORK_WEAK	-0.98	1.3	-0.44	0.8	-0.56	1.4
TIMELIMITS	-3.37	3.4	-1.29	1.3	-0.15	0.3
logEARNINGS_THRESH	0.17	1.1	-0.09	0.8	0.02	0.2
EARNINGS_TAX	0.01	0.6	0.00	0.3	-0.01	0.8
Other Controls*	Yes		Yes		Yes	
Province Effects	No		Yes		Yes	
Year Effects	No		No		Yes	
R-Squared	78.6		88.2		92.0	

* All other macroeconomic, policy, and geographic controls included. The models in this table all include the regressors from Model D except that NEWREFORM1 is unbundled into the five indicators shown (indicated by the label Model D').

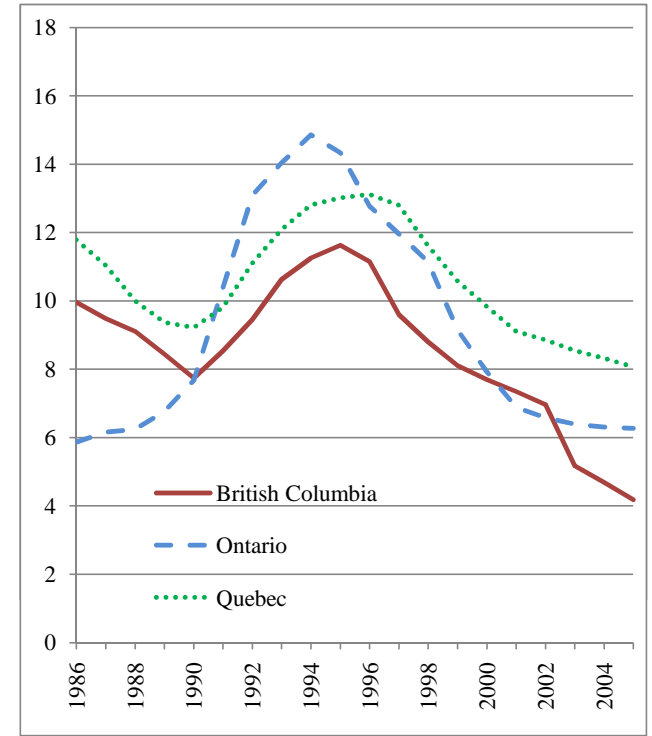Figure 1: Time Paths of Welfare Participation, by Province

Maritime Provinces (New Brunswick, Newfoundland, Nova Scotia, and Prince Edward Island)
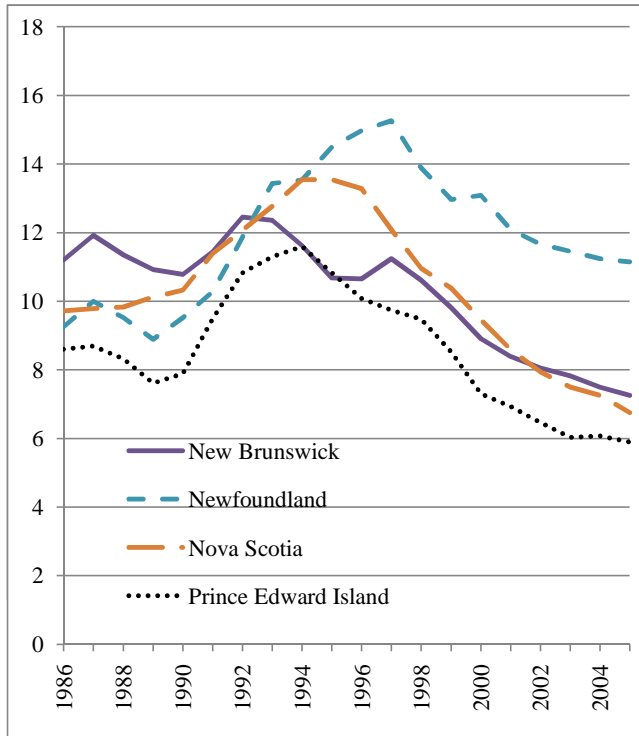
Prairie Provinces (Alberta, Manitoba, and Saskatchewan)
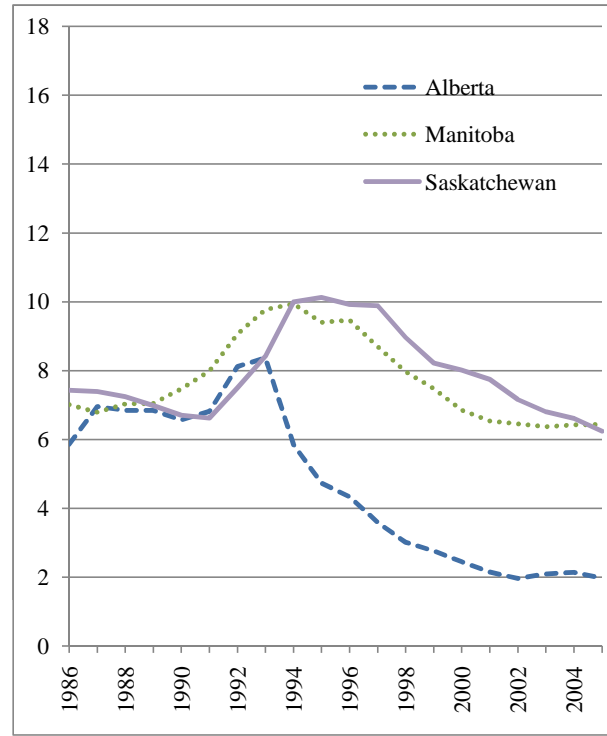
Provinces with Large Metropolitan Areas (British Columbia, Ontario* and Quebec)

* 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).