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## **Effects of New Welfare Reform Strategies on Welfare Participation: Microdata Estimates from Canada**

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## **Effects of New Welfare Reform Strategies on Welfare Participation: Microdata Estimates from Canada**

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**Abstract:** *This paper introduces newly coded information describing province- and year-specific variation in work requirements, diversion, earning exemptions, and time limits. This new information reveals a large decline in the chance of welfare participation of at least 1.1 percentage points (9.2% relative to the unconditional mean rate of participation) associated with stringent combinations of those four new welfare reforms, even after controlling for benefit levels, eligibility requirements, province-specific GDP growth and unemployment. These results replicate previous findings based on aggregate data and extend them with controls for individual-level characteristics. Microdata with individual-level characteristics enable estimates of the effects of new welfare reforms on 46 subpopulations, suggesting that immigrants, native Canadians, single parents and disabled people were far more effected by provinces' aggressive new attempts to limit welfare participation than other Canadians receiving social assistance.*

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

**JEL Codes:** H53, I38

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## **Effects of New Welfare Reform Strategies on Welfare Participation: Microdata Estimates from Canada**

### Section 1: Introduction

The welfare<sup>1</sup> system in Canada was relatively homogeneous across provinces under the Canadian Assistance Plan (CAP) passed in 1966. Although provinces enjoyed some limited discretion regarding benefit levels and eligibility requirements, the federal government guided most aspects of welfare policy. For example, federal provisions forbid provinces from implementing “workfare” or time limits.<sup>2</sup> By the mid-1990s, however, the percentage of working-age Canadians receiving welfare (i.e., welfare participation<sup>3</sup>) climbed to 12.5 percent in 1994. Facing slow economic growth and rising fiscal deficits, provinces began experimenting with different degrees of welfare reform, which produced a heterogeneous policy environment in both the timing and substance of provincial-level changes in welfare policy. This paper undertakes to code province- and year-specific variation in policy tools that were used in Canada under the heading of welfare reform to reduce welfare participation -- other than the more frequently studied policy tools of benefit levels and eligibility requirements -- and measure their effects on welfare participation in Canada.

Although some provinces experimented with new welfare reforms earlier, it was not until 1996 that the Canadian Health and Social Transfer (CHST) created a largely decentralized

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

<sup>2</sup> Workfare requires welfare participants to work in exchange for welfare benefits. This is different from *work requirements* discussed later in this paper, which typically include job search or school attendance under the heading of “work related activities” required by social assistance programs with work requirements. Ontario is the one province to implement workfare to a significant degree.

<sup>3</sup> In this paper, the welfare participation rate refers to the fraction of the non-elderly adult population (ages 18 to 64) receiving welfare benefits. Aggregate welfare participation rates in some data sources are defined as the percentage of non-elderly adults (ages 18 to 64) receiving welfare benefits of \$100 or more anytime in the month of March. At the micro level, welfare participation can be measured as a binary indicator, and the empirical models presented later in this paper undertake to explain the probability that a non-elderly adult is observed to be a welfare participant as a function of both individual-level characteristics and policy variables affecting everyone in a given province-year.

welfare system funded by block grants (to provinces) replacing centralized federal control under CAP.<sup>4</sup> Block-grant funding gave provincial governments much greater discretion over the mix of policy tools comprising provincial welfare systems. In addition to this new funding mechanism, CHST also eliminated nearly all federal restrictions on eligibility requirements and freed provincial governments to experiment with new policy tools used to control welfare participation.<sup>5</sup>

By 2005 (just nine years after passage of CHST and 11 years after the participation rate was 12.5 percent), Canada's welfare participation rate had fallen to 6.1 percent, raising the important question of whether (and how much of) this dramatic decline can be attributed to individual policy changes, to exogenous macroeconomic shocks, or to other factors still.<sup>6</sup> Canada's real GDP grew at an average annual rate of 3.4 percent from 1994 to 2005, and the national unemployment rate fell from 10.4 to 6.8 percent over the same period. Negative correlations with clear causal interpretations between macroeconomic growth and welfare participation are well established (Christofides, Stengos, and Swidinsky, 1997; CEA, 1999; Grogger and Karoly, 2005; Finnie and Irvine, 2008). The measurement question this paper pursues regarding the role of new welfare reforms is intended to complement these studies by including more disaggregated information about variation in welfare-related policy variables to our econometric models of welfare participation.

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<sup>4</sup> Under CAP, welfare benefits were funded according to a 50-50 cost-sharing agreement between the provinces and the federal government. This encouraged provinces to increase benefit levels more than they would have if the opportunity cost of each dollar spent on social assistance was a full dollar instead of only 50 cents (Gunderson, LeBlanc, and Kuhn, 1999; see also Banting and Boadway, 2004). This agreement was later changed to a block-funded grant with passage of the Canadian Health and Social Transfer.

<sup>5</sup> The only federal rule that remained under CHST was a provision forbidding provinces from imposing provincial residency requirements on eligibility.

<sup>6</sup> This information on welfare participation rates comes from the National Council of Welfare (NCW, 2008), which was closed by the federal government in 2012.

Advocates in favor of implementing new welfare reforms in Canada (described in detail below, the coding and effects of which are the focus this paper) argued that additional incentives to exit welfare and new barriers to entering welfare would reduce participation rates. This mechanism is, of course, not mutually exclusive of other mechanisms that potentially explain (at least a portion of) the large decline in Canada's participation rate, such as macroeconomic expansion of labor market opportunities that thereby induced welfare participants to exit welfare and supply more labor irrespective of various shifts in provincial-level welfare policy. Insofar as the data support the claim that a portion of the decline in participation resulted from changes in welfare policy variables, the empirical question remains of disentangling statistical associations between multiple policy tools (which fluctuated rather dramatically) and participation.

Benefit levels and eligibility requirements are perhaps the most frequently studied policy variables thought to influence welfare participation and therefore are referred to here as the *standard welfare reform* tools. As mentioned already, Canada's provinces also attempted to control welfare participation with aggressive new welfare reforms that include work requirements, diversion, earnings exemptions, and time limits, referred to collectively as *new reform strategies*.<sup>7,8</sup> The policy heterogeneity generated by Canada's relatively decentralized, provincially administered welfare systems provides statistical variation (across- and within-

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<sup>7</sup> These *new reform strategies* implemented at the provincial level in Canada were, in many ways, comparable to welfare reforms adopted at the federal level in the U.S. in 1996 when Congress passed the Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA). Welfare-to-work programs and other novel policies aimed at incentivizing labor supply among very low-income workers have been studied in detail based on various data sources, mostly from the U.S.: Greenberg and Robins (2011); Robins, Michalopoulos and Foley (2008); Greenberg, Ashworth, Cebulla, and Walker (2005); Lubotsky (2004); Cleveland and Hyatt (2003); and Gittleman, M. (2001). Complementing the present study's focus on the likelihood of participation, another strand of the empirical literature on the behavior of welfare participants investigates the determinants of entry and exit rates: Hansen and Lofstrom (2011); Stellmack, Wanberg and Kammeyer-Mueller (2003); and Ratcliffe (2002).

<sup>8</sup> Although earnings exemptions have been a part of Canada's welfare system for quite some time (i.e., they were not "new" in the mid 1990s), U.S. welfare participants faced high marginal tax rates until PRWORA in 1996. Ziliak (2007) and Moffitt (1999) show that earnings exemptions ("earned income disregards" in the U.S.) played an important role in welfare reform initiatives.

province) in the mix of welfare policy tools present in each province-year. This variation, in turn, enables estimation of their joint effect while controlling for individual-level characteristics in the Survey of Labour Income Dynamics (SLID) microdata as well as the considerable variation in benefit levels and eligibility requirements that occurred over the same period. Province- and year- fixed effects are included to remove time-invariant province idiosyncrasies and an arbitrary time series of annual shocks affecting provinces uniformly in each year. Inclusion of numerous controls for benefit levels, eligibility requirements, province-specific GDP growth, unemployment, and a rich set of individual-level demographic information, results in what we think are conservatively estimated effect sizes that can be interpreted as a lower bound on the magnitudes of the actual effect.

The policy tools coded as new reform strategies (i.e., stringent work requirements backed by threat of sanctions, diversion, earnings exemptions, and time limits) differ from standard reform tools in two main ways. First, they require specific new actions on the part of potential recipients in order to receive benefits. And second, they explicitly encourage employment as an alternative to welfare.<sup>9</sup> The next section describes the location, timing and content of those policy changes that constitute the raw information on which the disaggregated policy variables introduced in this paper are coded. The new reforms variable introduced here is an attempt to

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<sup>9</sup> Work requirements require welfare participants to perform work-related activity (such as volunteering, job search, or paid work) or else otherwise lose some or all welfare benefits. Diversion is a strategy that attempts to guide potential welfare applicants toward alternatives to welfare, even if that means higher short-term costs for the province's welfare program. In some provinces, applicants were given one-time payments as a substitute for welfare enrollment so that short-term needs could be met while reducing the probability of future welfare participation. Earning exemptions allow recipients to simultaneously collect welfare benefits and earn a limited amount of labor income to encourage employment. Although earnings exemptions do not require a "specific new action" from welfare participants, they were used to incentivize work in the U.S.'s welfare reforms and are included here to facilitate comparison. Time limits restrict the duration of welfare eligibility, potentially inducing would-be participants to ration their use of welfare and apply more effort to pursuing labor income. In the case of British Columbia, for example, non-exempt individuals were eligible for welfare for only two years out of every five-year period. For analysis of time limits and U.S. welfare participation, see Swann (2005) and Ribar et al. (2008).

capture information that adds important new detail to (at least partially) disaggregate the mix of policy changes and measure their effects on welfare participation.

Using U.S. data, Ziliak, Figlio, Davis and Connolly (2000), Blank (2001), Grogger (2003), and Danielson and Klerman (2008) introduce coding schemes similar in spirit to ours. Using Canadian data, Finnie and Irvine (2008), Kneebone and White (2009) and Shannon (2009) develop techniques for coding policy change using year- or province-level indicator variables, which begins to disaggregate different policy tools but is not identified separately from a province- or year- fixed effect. The present paper attempts to build on this work by extracting additional information about variation in welfare policy from administrative records and publications of provinces and other government agencies. Berg and Gabel (2012) apply the same methodology for coding policy variation from administrative records into four sub-categories of new reform strategies: work requirements, diversion, earnings exemptions and time limits. Using data aggregated at the level of province-years without individual-level microdata controls, they find large combined effects of the presence of new reform strategies on welfare participation while controlling for benefit levels, eligibility requirements, labor market conditions, and demographics (with the inclusion of year- and province- fixed effects).

Some provinces shifted benefit levels and eligibility requirements both before and after passage of CHST in 1996, reducing benefit levels and tightening eligibility requirements aggressively during the period from 1994 in which welfare participation declined. According to the National Council of Welfare (NCW), benefit levels for single individuals with no children fell on average 23 percent between 1994 and 2005, while benefits for single parents with one child fell an average of 18 percent (NCW 1995, 2006). A substantial literature links reductions in welfare benefits to declines in welfare participation (Card and Robbins, 2004; Hansen, 2007;

Lemieux and Milligan, 2008). The relationship between changes in eligibility requirements such as age restrictions, residency requirements, asset exemptions, and cohabitation rules (used with the intent of limiting welfare participation) is less well understood, although Allen (1993) and Green and Warburton (2004) both provide interesting evidence regarding the effectiveness of these policy tools.

The paper is organized as follows. Section 2 presents a table summarizing citations of administrative publications providing the raw information used to finely code disaggregated variables for indicating the presence and stringency of new reform strategies across province-years. Section 3 describes the SLID data, definitions of variables, and summary statistics. Section 4 presents empirical models of welfare participation that enable us to replicate with microdata the effects of new reform strategies previously reported using aggregated province-year data. Section 5 presents 46 subpopulation-specific new reform effects on welfare participation, which reveals which subpopulations responded most to the presence of new welfare reforms. Section 6 concludes with a discussion and interpretation of the empirical findings.

## Section 2: Description of New Reform Strategies

Table 1 summarizes the substance and timing of new reform strategies by province, distilled from information in numerous provincial government publications. The provinces' heterogeneous combinations of welfare policies generate what is effectively 10 natural experiments that the coding scheme introduced in this paper attempts to utilize to reveal new information about more finely disaggregated policy effects. This paper focuses on estimating the probability of an individual being on social assistance as a function of different policy



parameters and the descriptive task of estimating this probability separately for more than 40 subpopulations of interest.<sup>10</sup>

The four broad categories of new reform strategies in Table 1 are work requirements with sanctions, diversion, earnings exemptions and time limits. Table 1 further distinguishes province-years whose work requirements with sanctions and diversion were implemented with weak versus strong degrees of stringency of enforcement.<sup>11</sup> Based on the information presented in Table 1, different coding schemes could, in principle, vary according to the inclusiveness of the criteria used to code province-years as having meaningful new reform strategies in place. The coding scheme adopted in this study codes province-years as having new reform strategies in place whenever three or more non-weak new reforms are in effect as stated in Table 1. This contrasts with previous studies that adopted far looser and coarser coding schemes in which the welfare reform indicator “turns on” all provinces simultaneously after passage of CHST in 1996, which, in our view, misses the most interesting and substantial variation among provinces and through time as documented in Table 1.<sup>12</sup> The more stringent coding scheme in this study

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<sup>10</sup> A *coding scheme* refers to a mapping of the information in Table 1 into one or more variables to be included in an econometric model (in this study, an econometric model of the probability that an individual is observed to be a welfare participant in a given province-year). A companion paper utilizes the longitudinal component of SLID to investigate entry, exit, and duration of spells on social assistance.

<sup>11</sup> Work requirements are considered “weak” or “strong” according to whether sanctions for non-compliance could result in either complete elimination of welfare benefits or just a fraction (or none at all). This follows the methodology often found in studies using U.S. data (CEA 1999; Rector and Yousseff, 1999; Danielson and Klerman, 2008). Diversion is considered “weak” if the primary focus of the policy is to inform welfare applicants of other means of assistance or employment opportunities; “strong” diversion involved direct (and often, innovative) strategies to reduce welfare participation. These labels code what provincial and third-party sources document regarding important provincial differences in stringency of enforcement and the aggressiveness of welfare reforms in attempting to reduce participation.

<sup>12</sup> The question of whether it was “the economy” or policy (i.e., welfare reforms) that was responsible for the decline in welfare participation is addressed by Finnie and Irvine’s (2008) thorough and econometrically sophisticated study. Using individual-level administrative data, they find that macroeconomic changes were the most important factor in the reduction in welfare participation. In their study, welfare reform initiatives coded as year indicators (not differentiating between different provinces’ reforms) have a substantive negative effect on the probability of welfare entry. Kneebone and White (2009) take further advantage of policy heterogeneity by distinguishing different magnitudes of reform across provinces. Using province-level data, they find that tougher administrative procedures (very similar to what we define as new reform strategies) explain 47 to 65 percent of the decline in

(requiring three or more non-weak new reforms) has the additional advantage of matching the bundle of welfare reforms instituted under PRWORA in the U.S. and is intended to facilitate comparability with studies based on U.S. data. Unreported alternative runs based on a set of alternative coding schemes ordered by inclusivity (available from the authors) provide robustness checks confirming that the effects of new reform strategies reported in this study do indeed extract new information by providing an improved mapping of information in Table 1. In other words, the coding scheme should (and does) capture provincial and temporal policy variation by extracting additional information and goes beyond the extreme inclusivity of an overly simplistic coding scheme that views welfare reform merely as a pre- versus post-CHST difference.

New reforms are, by definition, distinct from changes in benefit levels and eligibility requirements as well as other labor market policy tools (e.g., province-year-specific minimum wages and unemployment insurance benefits). The empirical models reported below group variables under headings of policy tools, province- and year-specific macroeconomic conditions, and various sets of information recording demographic differences. As mentioned above, some observers model welfare reform in Canada after empirical approaches used to study federally enacted U.S. welfare reforms passed in 1996. Although there was some heterogeneity among U.S. states' implementation of federal rules, most studies of the U.S. code those reforms to have taken place at or nearly at the same point in time. In contrast, Canada's welfare reforms were substantially more heterogeneous and therefore, we argue, imply the need to include information describing this heterogeneity in empirical models of welfare participation.

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welfare participation occurring in provinces with those policies in place. Berg and Gabel (2012) use a larger province-level data set together with more finely differentiated measures of policy reform, reaching similar but slightly more modest conclusions about the magnitude of the main policy effects on welfare participation. In addition to new reform strategies, provincial unemployment rates explained a substantial portion of the decline in welfare participation.

According to Table 1, Alberta, British Columbia and Ontario pursued three or more non-weak reforms and would therefore be coded (in different years) as having new reform strategies in place.<sup>13</sup> By contrast, the provinces of Newfoundland and Quebec pursued few, if any, new reform strategies. The remaining provinces' degrees of implementation of new reform strategies fall somewhere in between.

The first goal of this paper is to investigate the extent to which the provincial-level analyses of Kneebone and White (2009) and Berg and Gabel (2012) can be replicated using individual-level microdata. The second goal is to exploit the demographic information in the microdata to describe which subpopulations were most and least sensitive to those new reform strategies for which their effects on participation have yet to be documented in much detail. This addresses the question of which Canadians actually responded to new welfare reforms and which subpopulations' responses to those policy changes can be most strongly associated with the precipitous drop observed in welfare participation.

### Section 3: Data and Descriptive Statistics

#### *Data Sources, Non-response, Sample Weights and Other Caveats*

This study uses the Survey of Labour Income Dynamics (SLID) with observations spanning years from 1993 to 2007. SLID provides detailed microdata with information about individual demographic profiles, financial situations, education, employment status, receipt of unemployment benefits, and receipt of welfare. SLID has both cross-sectional and longitudinal

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<sup>13</sup> Kneebone and White (2009), Shannon (2009), and Finnie and Irvine (2008) have also identified these three provinces as adopting the most significant reform, relative to the rest of Canada, although their timing is not exactly the same as in Table 1.

components.<sup>14</sup> The welfare participation model presented in this paper uses yearly cross-sectional data, sometimes referred to as “pooled” panel data. The mean respondent in SLID appears in 2.1 annual cross sections, which unfortunately introduces same-respondent correlation among error terms that we attempt to address by using robust standard error estimates.<sup>15</sup> We also ran versions of the model using those respondents who were observed only once, and another run of the model using only those who were observed in multiple years with individual fixed effects, to check the qualitative robustness of the reported findings.

SLID employs a sample design stratified by province and sub-regions within provinces. SLID provides sample weights for individual survey response data designed to achieve a nationally representative sample. SLID actually provides two sets of sample weights, one for the population distribution in the first year of each longitudinal wave (referred to as longitudinal weights), and another representing Canada's current population (cross-sectional weight) (Statistics Canada, 2010a). These weights are adjusted to account for non-response, drawing on information in administrative data bases attempting to improve the representativeness of the SLID data. There is some debate about the desirability of sample weights in applied econometric studies. Bloom and Idson (1991) conclude that sample weights have little impact on the size, sign or significance of estimates in most labor models, while Khan, Khan, Hutchinson, and Hotchkiss (2007) raise the possibility that sample weights may lead to misleading results. By contrast, Magee, Robb and Burbidge (1998) argue that weighting is important to generate the most accurate estimates when using data from the Canadian Survey of Consumer Finances (SCF)

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<sup>14</sup> The cross-sectional component was designed so that it could be combined with the Survey of Consumer Finances (SCF), 1976-1997. The years in which both SLID and SCF data were gathered (i.e., 1993 through 1997) provide a combined sample, which skews the number of observations toward this earlier period: there are about twice as many observations in the pooled panel from 1993-1997 as in later years).

<sup>15</sup> For instance, the standard errors produced by STATA's "robust" option are conservative in the sense of allowing for mis-specification of the error term and some amount of correlation, typically shrinking t-statistics toward zero and making it harder for the data to indicate a statistically significant effect.

in particular. Moreover, numerous applied econometric studies apply sample weights (e.g., Cappelli, 2004). Using sample weights leads to larger estimated effect sizes for the new reform strategies variable in our coding scheme. In the interest of reporting conservative effect sizes that can be interpreted as lower bounds on true effect size, un-weighted estimators are presented throughout.<sup>16</sup>

Although SLID is rich with individual-level data, a number of studies have noted problems using survey data and relying on respondents' self reports (Riddell and Riddell, 2006; Klerman, Ringel and Roth, 2005; Warburton and Warburton, 2004; Kapsalis, 2001; Berg and Lien, 2006; and Berg, 2005). Warburton and Warburton (2004) find that the incidence of self-reported welfare receipt among SLID respondents appears significantly under-reported when compared to administrative data, with, for example, self-reported welfare benefits in SLID amounting to only 65 percent of the levels paid out according to administrative data. Self-reported educational attainment likewise has been mentioned as inflated relative to population distributions of educational attainment based on administrative records. In the U.S., the magnitude of under-reporting of welfare receipts in the 2001 American Community Sample Survey may be as much as 50 percent (Lynch, Resnick, Staveley, and Taeuber, 2008).

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<sup>16</sup> Appendix W presents weighted and un-weighted sample means, side by side, to directly see the extent of over- and under-representation in the raw data. The two samples are broadly similar and under-counting generally does not appear to be severe, aside from singles, minority mothers and minority fathers, and likely college graduates as well. This is not an issue however in the subpopulation analyses estimated using only singles, minority mothers and fathers, respectively. Appendix W also shows that the raw sample under-counts people living in province-years with new reform strategies, the result of having twice as many observations from earlier years when relatively few new reform strategies had been adopted. A recent report on educational attainment by HRSDC (2010) indicates that about 11 percent of Canadian adults had earned a college degree or better in 1990, and 19 percent in 2007. Yet according to Table 3, only about 9.3 percent of respondents in Table 3 report having earned a college degree or better. It should be noted that the combination of SLID and SCF between 1993 and 1997 gives roughly twice as many observations during these years, which distorts rates of educational attainment downward insofar as education rates are rising over time while the sample in Table 3 over-weights earlier years. Over-weighting earlier years with fewer new reforms would, once again, suggest a usefully conservative interpretation of the estimated effects in later sections, which should provide lower bounds on true effect sizes as a result of under-representation of people in province-years with new reform strategies in place.

In addition to individual-level data from the SLID, we also use province-level data on unemployment rates, real GDP growth, lags of these macroeconomic variables, and unemployment insurance benefits obtained from Statistics Canada.<sup>17</sup> We also use provincial minimum wage rates provided by the Minimum Wage Database at Human Resources and Skills Development Canada [HRSDC] (2009). Other provincial policy variables include asset exemption limits and welfare benefit levels obtained through the National Council of Welfare and their annual series on *Welfare Incomes* (1994). Unless otherwise stated, all dollar units are adjusted for inflation and expressed in C\$2007.

### *Highlights of Descriptive Statistics*

Table 2 describes the variables used in this paper. The dependent variable, WELFARE\_RECEIPT, takes the value of 1 if the respondent reported having received welfare benefits of C\$101 or more in a given year, and 0 otherwise.<sup>18</sup> The variable logBENEFITS provides normalized information about varying real annual levels of welfare benefits for single parents with one child.<sup>19</sup> Demographic, education, family type, and labor variables were generated from the SLID database. Education non-response and family-type non-response indicator variables (EDUC\_NONRESP and FAMILY\_NONRESP) were included to deal with the high rates of non-

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<sup>17</sup> Statistics Canada data files used in this study are Provincial Economic Accounts, Income Trends in Canada 1976 to 2007, as well as the CANSIM database tables 282—0086 and 384—0009 (2007, 2009, 2010a, 2010b, 2010c).

<sup>18</sup> Following Finnie, Irvine, Scevior (2004) the \$101 cutoff reduces the likelihood of possible coding errors, as well as ignores insignificant degrees of welfare receipt. Other measures to proxy for being on welfare were used in unreported runs of the main regressions, for example, using total welfare benefits received in a given year as the dependent variable. The qualitative findings regarding effects of the main policy variables were not substantively different. In addition, the binary dependent variable in a linear probability model specification provides easy-to-interpret coefficients, translating a one-unit change in each regressor into an expected change in the probability of welfare participation. Appendix L provides logit results based on identical sets of right-hand-side variables as reported in the linear probability model reported in the next section.

<sup>19</sup> Benefits levels depend on province-specific schedules for different family types. Variation through time in benefit levels for different family types tracks each other reasonably closely although not perfectly. Rather than including five or more highly correlated benefit levels variables for each family type, we include this one as proxy for provincial heterogeneity and fluctuations over time. Roughly 60 percent of people on welfare are single individuals with no children, which provides one indication of how imperfect this proxy is.

response to education and family-type survey items while introducing as little non-response bias as possible.<sup>20</sup> Non-responders to the disability questionnaire item were coded as non-disabled, and non-responders to the minority item were coded as non-minority. Native Canadian refers to those whose ancestry pre-dates the arrival of Europeans in North America, also referred to sometimes as aboriginals. We used response data only from respondents ages 18 to 64, as those outside this range are either too young or too old to apply for welfare in Canada. Aside from exceptions explicitly mentioned, the demographic indicators (and all other variables in the regressions) have pairwise correlations less than 0.350 in magnitude.

### *Summary Statistics*

Table 3 presents summary statistics for the variables used in the most encompassing of the empirical models reported in the following section.<sup>21</sup> The number of observations is 921,449, which comes from pooling 15 annual cross sections from 1993 through 2007. These observations are taken from 445,486 unique individuals whose mean number of observations over the 15 years is 2.1. Approximately one-third of respondents in our sample (310,554) had only one observation. According to Table 3, the unconditional mean of the dependent variable, WELFARE\_RECEIPT, is 9.2 percent. Although Kapsalis (2001) and Warburton and Warburton (2004) suggest that this number based on SLID data is significantly lower than that calculated from administrative data sources (e.g., provincial welfare agency records), this mean based on

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<sup>20</sup> The variables EDUC\_NONRESP and FAMILY\_NONRESP were highly correlated with one another (pairwise correlation of 0.895), indicating that those who did not respond to questions about education levels also did not provide family type information either.

<sup>21</sup> Access to the SLID database is contingent on respecting privacy rules established by the Canadian government. As a result, certain descriptive statistics such as median, minimum and maximum values are not permitted to be released as they may risk revealing private information.

SLID tracks rather closely with the unconditional mean welfare participation rate of 9.0 from 1986 through 2005 reported in Berg and Gabel (2012).

The policy variable NEWREFORM takes a value of 1 in province-years in which the province adopts three or more non-weak new reforms as summarized in Table 1, and 0 otherwise. The province-years indicated by NEWREFORM = 1 are Alberta (1993-present), British Columbia (2002-present) and Ontario (1996-present).<sup>22</sup> The unconditional mean of NEWREFORM in Table 3 indicates that 31 percent of observations in the sample are from province-years that have adopted new reform strategies. While this number appears large, it should be noted that Alberta, British Columbia, and Ontario account for about 60 percent of the Canadian population, reflecting the under-counting issue mentioned earlier (i.e., recalling that, in the weighted sample shown in Appendix W, the mean of NEWREFORM rises to 45 percent).

Overall, province-level macroeconomic variables UNEMPLOYMENT and REALGDPGROWTH have large degrees of variation. For example, the largest level of unemployment (20.1 percent) and lowest level of real GDP growth (-4.6 percent) occurred in Newfoundland in 1993 and 1996, respectively. Interestingly, Newfoundland also experienced the highest real GDP growth rate (15.6 percent in 2002). Provincial unemployment rates reached their lowest level of 3.4 percent in Alberta in 2006. The Maritime Provinces (New Brunswick, Nova Scotia, Prince Edward Island, and Newfoundland) have had higher rates of unemployment and slower rates of economic growth.

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<sup>22</sup> Kneebone and White (2009) suggest that British Columbia was a reformer comparable to Alberta and Ontario since 1996. The information in Table 1 and our stringent coding scheme offers a different view. Specifically, the BC reforms appear to have been more comparable to those of Saskatchewan and Prince Edward Island early on (i.e., prior to CHST), with markedly slacker stringency than in Alberta and Ontario. Table 1 suggests that, following CHST, only Alberta, British Columbia, and Ontario undertook reform efforts comparable to those adopted under PRWORA. This runs in stark contrast to Finnie and Irvine (2008), who state that “the more draconian elements” of U.S. welfare reform legislation were “avoided” in Canada. Also, policies adopted mid-year were coded numerically as fractions, based on the number of months the policies were in effect during the calendar year.



Another statistic of interest is the rate of receipt of unemployment benefits, which is about a quarter of the sample (or 21.1 percent in the weighted sample). The variable `UI_RECEIPT` is an indicator = 1 if an individual reports receiving any unemployment benefits during the year. This large rate of receipt of unemployment benefits seems large. The mean amount of unemployment insurance benefits was C\$1536, which is an economically significant annual sum for many. This control is critical because one would, all else equal, expect greater reliance on unemployment benefits to be among the important consequences of welfare reforms that restricted access to welfare and encouraged applicants to look for alternative sources of income and income support, including unemployment insurance.

Likewise, `EMPLOYED` appears to be relatively low, with just 45.6 percent of respondents reporting that they were a paid worker in a given year. According to HRSDC (2010), employment as a percentage of working-age Canadians has ranged from about 58 percent to 63 percent over the sample period. One possible cause for this discrepancy is the large number—about one-third of the entire sample—of non-respondents who were classified as *not* having been in paid work by the default rule in our coding scheme. Again, using sample weights mitigates this issue to a modest extent although not nearly enough to get it in the expected range based on HRSDC reports, with the weighted mean employment rate rising to 48.8 percent.

### Section 3: Empirical Welfare Participation Models

#### *Empirical Models*

Pooled cross-sectional data are used to estimate discrete dependent variables models where each individual is assumed to be observed only once. The primary dependent variable is the binary indicator  $Y_{ipt}$  representing whether individual  $i$  was in receipt of C\$101 or more in welfare benefits when residing in province  $p$  and observed in year  $t$ . Linear probability model

(LPM) specifications are reported below for ease of interpreting constant marginal effects (i.e., not dependent on right-hand-side information as marginal effects in nonlinear probability models are), although the more general probability model is stated here:

$$\text{Prob}(Y_{ipt} = 1 | X_{ipt}) = F(X_{ipt}, \beta),$$

where  $X_{ipt}$  is a  $k \times 1$  vector of variables thought to influence  $Y_{ipt}$  and  $\beta$  is a vector of parameters describing the cumulative distribution function  $F$ .

The first of five specifications, Model A, regresses individual-level welfare participation on 11 province-level policy variables stacked in the vector  $P_{pt}$  ( $P$  for policy variables that vary only by  $p$  and  $t$  but not over  $i$  with a particular province-year) in addition to province and year fixed effects. The main explanatory variable,  $\text{NEWREFORM}_{pt}$ , captures between-province and intertemporal variation in provinces' new reform strategies. Four other province-level variables account for variation in standard welfare reform tools (i.e., benefits levels and eligibility requirements) and labor market policy parameters:  $\log\text{ASSET\_THRESH}_{pt}$ ,  $\log\text{BENEFITS}$ ,  $\log\text{MINWAGE}_{pt}$  and  $\log\text{UNEMP\_INS}_{pt}$ .<sup>23</sup> Province-specific macroeconomic variables consisting of unemployment rates ( $\text{UNEMPLOYMENT}_{pt}$ ), real GDP growth rates ( $\text{REALGDPGROWTH}_{pt}$ ), and their respective lags over two-periods complete the list of variables included in  $P_t$ . Model A can now be expressed compactly as:

$$\text{Model A: } Y_{ipt} = \alpha + P_{pt}'\mu + \xi_{pt} + \varepsilon_{ipt},$$

where  $\mu$  represents the main policy and macro marginal effects of province-level policy variables on individuals;  $\xi_{pt}$  is the unobserved heterogeneity that varies at the province level over time, which can be controlled for using province and year fixed effects, or with a random effects model;  $\varepsilon_{ipt}$  represents unobserved individual-level heterogeneity; and  $\alpha$  is a constant. The error

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<sup>23</sup> For a discussion on the importance of asset thresholds affecting the behavior of would-be welfare participants, see Bansak et al. (2010); Hurst and Ziliak (2006); and Sullivan (2006).

term  $\varepsilon_{ipt}$  is assumed to have zero mean and, when stacked into vector form, either a diagonal or block diagonal covariance matrix to allow for systematic differences in the magnitude of unobserved heterogeneity (e.g., clustering by province) and one-period autocorrelation. The first element of  $\mu$  corresponds to  $\text{NEWREFORM}_{pt}$  which is the primary policy effect of interest, representing the change in probability of being a welfare participant when moving a person with the same characteristics and other policy parameters from a province-year without new reforms to a province-year with new reforms.

Model B adds to Model A (after omitting the 60 to 64 age bracket as the reference class) 15 individual-level demographic variables as shown in Table 3, stacked in the vector  $D_{it}$  (basic demographics excluding education, family type and labor market experience) with corresponding 15x1 vector of coefficients  $\rho$ .<sup>24</sup> These variables capture differences in age, ethnicity, gender, and nativity:

$$\text{Model B: } Y_{ipt} = \alpha + P_{pt}'\mu + D_{it}'\rho + \xi_{pt} + \varepsilon_{ipt},$$

where we note there are abuses of notation reusing Greek symbols that take on distinct values and probability distributions in different models. Although model names are not indicated with subscripts, each appearance of  $\alpha$ ,  $\mu$ ,  $\rho$ ,  $\xi_{pt}$  and  $\varepsilon_{ipt}$  should be interpreted as specific to Model A, B, C, D or E. For each one unit change in the demographic variables stacked in  $D_{it}$ , the coefficients in  $\rho$  measure the change in the probability of being in receipt of welfare associated with a one-unit change in each demographic factor. Note that all the variables in  $D_{ipt}$  are binary, with the exception of  $\text{YRS\_IMM}_{it}$ .

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<sup>24</sup> Gelbach provides a very useful demonstration of the importance of the order in which regressors are added to a model, showing that sequential inclusion of additional sets of controls does not necessarily imply robustness of the empirical results. We attempted to choose the ordering (presented here) best motivated by theory and relevant policy debates over causes of observed welfare declines.

Model C adds eight dummy variables reflecting the highest levels of education attained by respondents. High school dropouts are the omitted reference class among the nine mutually exclusive and exhaustive education indicators:

$$\text{Model C: } Y_{ipt} = \alpha + P_{pt}'\mu + D_{it}'\rho + E_{it}'\pi + \xi_{pt} + \varepsilon_{ipt},$$

where  $E_{it}$  is a 8x1 vector of education variables;  $\pi$  is an 8x1 vector of coefficients measuring the expected change (relative to high school dropouts) in the probability of receiving welfare for individuals at each level of educational attainment.

Next, Model D adds eight family-type indicator variables (including one for family-type non-responders), with single individuals with no children serving as the omitted reference class:

$$\text{Model D: } Y_{ipt} = \alpha + P_{pt}'\mu + D_{it}'\rho + E_{it}'\pi + F_{it}'\kappa + \xi_{pt} + \varepsilon_{ipt},$$

where  $F_{it}$  is an 8x1 vector of family type variables; and  $\kappa$  is an 8x1 vector of coefficients that measure the expected change in the probability of receiving welfare for individuals with a particular family type relative to an otherwise similar individual who is single with no children.

Finally, we add two variables representing receipt of unemployment benefits in excess of 100 dollars and receipt of workers compensation in excess of 100, denoted  $UI\_RECEIPT_{it}$  and  $WKC\_RECEIPT_{it}$ , respectively, which might be alternatives (or possibly, gateways) to welfare:

$$\text{Model E: } Y_{ipt} = \alpha + P_{pt}'\mu + D_{it}'\rho + E_{it}'\pi + F_{it}'\kappa + L_{it}'\delta + \xi_{pt} + \varepsilon_{ipt},$$

where  $L_{it}$  is a 2x1 vector stacking the two indicators mentioned above, and  $\delta$  is a 2x1 vector of associated coefficients.

The province-year shock  $\xi_{pt}$  can be broken down into three components:

$$\xi_{pt} = \eta_p + \tau_t + v_{pt},$$

where  $\eta_p$  is the province effect,  $\tau_t$  is the year effect, and  $v_{pt}$  is a residual. Including provincial and year dummies (omitting Alberta and 1993 as reference classes) to Models A through E absorbs

the first two terms, leaving the individual-heterogeneity term to absorb the residual term from the province-year shock, which we attempt to deal with by computing robust standard errors clustering on provinces.

### *Regression Results*

The first column of Table 4 shows that using only province-level variables, adoption of stringent combinations of new reform strategies is associated with a 1.3 percentage point decline in the probability of receiving welfare. Relative to the unconditional mean rate of receiving welfare which was 9.2 percent, this policy effect is an economically and statistically significant 14 percent reduction in the likelihood of receiving welfare. The effect size of NEWREFORM is never smaller than 1.1 percentage points across all models in Table 4.

The variable logBENEFITS has a positive effect across all five models in Table 4, the largest of which is 0.022, implying that a benefits reduction of 50 percent might not be enough to bring about a decline in welfare participation as large as a move from a province-year without new reforms to a province-year with. The sign of the effect on real asset limits (logASSET\_THRESH), which varies relatively little across provinces and through time, is opposite of what one would expect, although its magnitude is tiny.

Coefficients on UNEMPLOYMENT suggest that a 1 percentage point increase in the unemployment rate increases the probability of receiving welfare by about 0.2 percentage points, a modest-size but nevertheless statistically significant effect. Summing effects on unemployment and its two lags implies that a 1 percentage point increase in the unemployment rate would increase the probability of receiving welfare over the two subsequent years by 0.45 percentage

points. Changes in real GDP growth have much smaller effects on the expected rate of welfare participation.

Model B introduces individual-level demographic information from which one observes that being young dramatically increases the likelihood of welfare participation relative to those with similar policy environments and characteristics who are over 40. Comparing age coefficients in other models reveals that differences in education and other sources of variation explain away at most half of the age effect for the youngest working-age Canadians while not at all diminishing the effect sizes in the 23 to 30 and 31 to 40 age categories. These findings are generally consistent with Finnie, Irvine, and Sceviour (2004), who find that adults aged 18-24 are more likely to receive welfare, while older age groups have a substantially lower probability of receipt.

The effect size on the variable NATIVE is very large across all models, indicating that native Canadians' probability of being a welfare participant is on the order of 10 percentage points larger than the mean sample respondent net of differences in province, year, policy, macroeconomy, human capital, and all other demographics measured in SLID. In percentage terms, this difference is well in excess of a 100 percent greater risk of being on welfare. HRSDC (2010) catalogs other social problems among native Canadians and risk factors that likely correlate with welfare participation.

Education attainment controls are included in Model C. Not surprisingly, the estimates suggest that attaining any diploma, certificate, or training credential is associated with a strongly negative reduction in the probability of welfare participation relative to those who did not finish high school. Master degrees, professional degrees, and doctorates have the largest impacts on welfare receipt although not much larger in absolute terms than a high school diploma. Even

those who did not respond to the education items on the survey (EDUC\_NONRESP) had five percentage points lower risk of being on welfare.

Model D adds information about family structure that yields large effects on the probability of welfare participation. Regressing welfare receipt solely on family type indicators (not reported in tables included here) produces an R-Squared of 3 percent. Including family type information raises R-Squared substantially from 6.5 in Model C to 8.9 percent in Model D. It appears that marital status is more important than fertility as a determinant of welfare receipt. Comparing effect sizes for coupled versus uncoupled respondents (holding number of children constant) reveals that welfare participation risks are 19, 21 and 24 percentage points higher for un-coupled individuals, with one, two and three or more kids, respectively (true in both Models D and E in Table 4). Among those without kids, being married decreases the risk of welfare receipt by 7 percentage points. On the other hand, having a child out of wedlock increases one's probability of welfare receipt by more than 13 percentage points.

Model E adds two controls for unemployment insurance receipts and workers compensation benefits. Estimates in the final columns of Table 4 suggest that both UI\_RECEIPT and WKC\_RECEIPT are negatively associated with welfare receipt, implying that these different social programs function as imperfect substitutes, but substitutes nonetheless. Those who receive unemployment or workers compensation are 3 percentage points less likely to receive welfare. Welfare administrators in some provinces that adopted policies of deterrence explicitly advised new welfare applicants to seek unemployment insurance instead. And individuals with alternative sources of benefits would, all else equal, have less demand and reduced eligibility for welfare.

Effect sizes and statistical significance of estimated coefficients for NEWREFORM do not change very much at all between Models A through E. It is noteworthy that macroeconomic fluctuations, labor market policy, and the standard reform tools of benefits levels and eligibility hardly reduce the marginal effect of new reform strategies on expected rates of welfare participation. In our most comprehensive model, the adoption of new reform strategies reduces the probability of welfare receipt by 1.1 percentage points. Similarly, the coefficients for logBENEFITS appear stable even after including more individual-level controls. Somewhat surprisingly logMINWAGE and logUNEMP\_INS, which help proxy for viable alternatives to welfare, have very little influence on the likelihood of an individual receiving welfare.

Regarding the question of replicating with individual-level microdata what Kneebone and White (2009) and Berg and Gabel (2012) reported using data aggregated at the province-year level, the microdata provide confirmatory replication of these previous studies of the effects of new reform strategies on welfare participation. Although the effect sizes are somewhat smaller after adding individual-level controls, the qualitative findings in this study using microdata for NEWREFORM, logBENEFITS, and UNEMPLOYMENT appear broadly consistent with effects estimated using data aggregated by province (Kneebone and White, 2009). As one might expect, the disaggregated microdata add new empirical detail showing the importance of human capital, family type, and nativity status on the risk of welfare participation. Including this individual-level information moderates the large effects of the unemployment rate reported in previous studies. In addition to Kneebone and White (2009) and Berg and Gabel (2012), the study of Finnie, Irvine and Sceviour (2004) uses administrative data over the period 1992-2000 and finds very large effects of provincial unemployment rates on the probability of welfare receipt. While our unemployment rate effects are considerably smaller, Table 4 confirms Finnie, Irvine and



Sceviour's (2004) finding that single parent status is among the greatest risk factors increasing the probability of welfare participation (by 14 to 22 percentage points in the present study).

In addition, Table 4 shows a large mover effect in the models with the full set of controls: individuals who change provinces in a given year have a higher probability of being in receipt of welfare, increasing on the same order of magnitude as the decrease associated with new reforms being in place. The literature on the relationship between welfare and migration is mixed. Levine and Zimmerman (1995) find that differences in state welfare benefits had no impact on migration decisions. By contrast, Kaestner, Kaushal, and Van Ryzin (2003) found that the imposition of time limits in the U.S. reduced the probability of low-educated single parents migrating to another state while increasing within-state migration for employment-related reasons. Time limits would likely reduce the gain from migrating to another state, truncating the gains in the future stream of expected benefits. Their findings suggest that welfare recipients generally respond to financial incentives and would relocate to states with higher benefits, *ceteris paribus*. Finnie (2004) provides evidence using Canadian data showing that the receipt of welfare is positively associated with inter-provincial mobility among men (in most age groups) and middle-aged women. The relatively large positive association of mobility with welfare receipt in this paper's microdata model contrasts with the previous study (Berg and Gabel, 2012) that did not find evidence of provincially aggregated migration rates noticeably influencing welfare participation rates.

### *Robustness Checks*

There are well-known logical problems (e.g., the possibility of negative or greater-than-100-percent estimated probabilities) and econometric problems (e.g., heteroskedasticity) with the

linear probability model, even though Amemiya (1981) and many others showed the similarity of marginal effects computed from LPM, logit and probit estimates. Logit versions of all regressions reported in this paper are available upon request, highlights from which are presented in Appendix L. In general, qualitative findings are consistent with LPM results. If anything, we observe greater statistical significance and effect sizes (when converting to marginal effects, which depend on the mean value of all right-hand-side variables) for NEWREFORM in the logit specification. One substantive change is that, in the logit specification, UNEMPLOYMENT loses significance and occasionally switches sign. All lagged versions of UNEMPLOYMENT, however, have the expected signs. Another potentially important difference in LPM versus logit estimates is the unstable sign of provincial unemployment insurance benefit levels (logUNEMP\_INS) across different models using the logit specification.

As a last robustness check, Appendix R presents additional estimates across a number of different specifications. The first alternative error specification, listed in column 1, uses STATA's "robust" option to allow for heteroskedastic disturbances, which shows that the primary policy effect on NEWREFORM retains its strong statistical significance. The second column adopts Arellano's (1987) clustering technique which allows for autocorrelation in error terms, which shrinks the t statistic on NEWREFORM by half which leaves it at a highly statistically significant 2.4. Other estimates of interest, such as those for the demographic, education, and family type regressors, also retain patterns of statistical significance reported in Table 4 under these more cautious error-term specifications.

Column 3 in Appendix R shows that estimates resulting from estimating Model E using weighted cross-sectional data only increase the magnitude of the effect size of NEWREFORM from -0.011 to -0.015 (a 36 percent increase). The signs and effect sizes of the other coefficients

are roughly comparable to earlier estimates. In column 4 of Appendix R, the province fixed effects Model E was estimated using a subsample that included only those respondents who were observed just once. These respondents quickly attrited from the SLID. The corresponding effect size of NEWREFORM ( $-0.005$ ) was much smaller than in any other model and is not statistically significant. Data with only one observation come largely from the SCF between the years 1993 and 1997. Finally, we augment the province fixed effects model by including individual fixed effects using a subset of individuals observed more than once, treating the cross-sectional data as an unbalanced panel (presented in column 5). On average there were 4.5 observations per group (individual). This model is, no doubt, over-parameterized with more than 140,000 fixed effects in a sample of size of 610,895. All time-invariant individual-level demographic variables are dropped from this model specification because of the inclusion of individual fixed effects. We find that the effect size of NEWREFORM decreases slightly in absolute terms, from  $-0.011$  to  $-0.009$ , but retains its strong statistical significance.<sup>25</sup> Lastly, Column 6 estimates Model E only among the non-disabled population. The effect size of NEWREFORM falls by about 18 percent as compared with the estimate for the full sample, suggesting that new reform strategies had a slightly larger impact on those classified as disabled.

#### Section 4: Subpopulation Analysis of Welfare Participation

This section describes how particular subpopulations of Canadians (as represented, albeit imperfectly, in the SLID) were affected by new reform strategies. We estimate Model E separately on 46 different subpopulations in the presence of all other non-constant controls in that model (equivalent to a fully interacted model in which all coefficients depend on

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<sup>25</sup> For comparison, the effect size of NEWREFORM is equal to  $-0.015$  in the subsample of respondents who were observed more than once (without the inclusion of individual fixed effects).

subpopulation membership). Table 5 reports only coefficients on NEWREFORM in a subpopulation-specific estimation of Model E across 46 subsamples.

According to Table 5, the effect of NEWREFORM on young adults aged 18 to 22 is more than twice that of the population as a whole (-0.025 versus -0.011). The subpopulation aged 23 to 30 is 50% more effected by the presence of new reform strategies than the mean person in the sample (-.016 versus -0.011). Those nearing retirement age are also significantly more affected by new reform strategies. The positive mover effect in the full-sample model is larger when estimated only among movers, but is estimated very imprecisely and fails by a considerable margin to reach statistical significance.<sup>26</sup>

Based on Table 5, it appears that new reform strategies reduced welfare participation relatively more among those with disabilities, minorities, natives, and immigrants. New reform strategies were disproportionately effective in reducing welfare among those with relatively low levels of education, too. For example, in the presence of new reform strategies, respondents whose highest educational credential is a high school degree are 2.2 percentage points less likely to be in receipt of welfare—almost double the effect size as for the population in general. Those with a college degree or better appear to be relatively unaffected by new reform strategies. There is a puzzling positive coefficient among the subsample of masters degree holders for which we find no easy explanation.

Subpopulation definitions based on family type reveal considerably larger effects of new reforms on individuals in those family types than in the general population. Parents' expected decline in welfare participation was -0.019, which is more than 50 percent larger -0.011 in the

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<sup>26</sup> The effect is nevertheless tempting to interpret in light of anecdotes of welfare administrators in Alberta, for example, offering welfare applicants a lump-sum payment to travel to neighboring provinces (possibly applying for welfare in the destination province) to prevent adding new welfare participants in Alberta (Smyth, 1993; Yaffe, 1994).

population as a whole. Single parents' expected decline in welfare participation was -0.051, which is four to five times larger than for the entire population. Unmarried parents appear to have adjusted in response to new welfare reforms to a much greater extent than the average person in the sample. There is some inconsistency that we cannot explain among estimated policy effects: for example, the effect of new welfare reforms on risk of welfare participation is -0.062 among single parents with one child, -0.122 among single parents with three or more children, but statistically insignificant (and positive) for single parents with two children.

Among coupled parents, those with one child were more affected by new reforms than couples with two children. Couples with two children were more affected than couples with three children. This may be because larger families with more children faced higher costs of job search or higher direct and indirect costs of moving to a new location with jobs. For example, greater time allocations to childcare leave less time for job search; more children imply greater housing costs and proportionately greater costs of finding new housing; greater frictional costs of finding new schools and daycare for children could link number of children and attachment to welfare participation; and greater reliance on friends and relatives for childcare consequently increases the difficulty of moving.<sup>27</sup> This raises a puzzle, however, because all these factors would tend to decrease the policy effect size for *single* parents with more children as well as coupled parents. The data seem to indicate a curiously sharp divide in terms of the degree to which single versus coupled households adjust in response to new welfare reforms.

Interestingly, there does not seem to be a big difference in how new reform strategies affected

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<sup>27</sup> Bitler, Gelbach and Hoynes (2006) examine the challenges that families with children face attempting to comply with the requirements of stringent new welfare reforms. They find, for instance, that children are more likely to live with married parents and more likely to live with no parents (i.e., grandparents, and rarely, foster care) in states that adopted welfare waivers which were a precursor to PRWORA.

mothers versus fathers, although both subsamples produced moderately larger effect sizes relative to the overall mean.

The last set of subsamples is defined based on job type items in SLID. We find that new reform strategies had a moderately greater impact on those who were employed and on those who held commission-paying jobs. "Commission-paying" refers to jobs that receive tips or commissions (e.g., waiting tables or working retail sales with commissions). In contrast, managers are likely to be relatively insulated from layoffs and experience low and idiosyncratic spells of unemployment, resulting in effects on welfare participation that were small and not statistically significant.

#### Section 6: Discussion and Interpretation

This paper undertakes to quantify the extent to which new reform policies detailed in Table 1 contributed to observed declines in welfare participation, in the presence of controls for standard welfare reform tools, labor market policy tools (i.e., unemployment and minimum wage), macroeconomic fluctuations (i.e., province-specific GDP growth, unemployment rates, and lags of these variables), and controls for individual-level demographic differences. Thus, we aim to produce estimates suggestive of new reform strategies' relative effects on welfare participation, whether observed declines in welfare policy were associated more with policy or "the economy," and which subpopulations were most affected by these new welfare reforms.

The empirical models suggest that new reform strategies significantly reduced the probability of welfare participation by a minimum of 13 percent overall and by much larger percentages in subpopulations described in the previous section. The finding that the mean person in the sample faces a reduced risk of welfare participation of 1.1 percentage points when

new reform strategies are present replicates the effects reported in previous studies using data aggregated at the level of province-years and lacking the individual demographic controls used in this study. In contrast to the relatively precisely estimated effects of new reform strategies on welfare participation, the so-called standard reform tools (i.e., reductions in benefits levels and stringent eligibility requirements) explain relatively small portions of variation in welfare participation.

Based on Table 5, the participation rates of the disabled, immigrants, aboriginals, and single parents, appear to have responded to the presence of new reform strategies significantly more than the average Canadian in our sample. The expected rate of welfare participation for these groups fell by two to four times the mean rate of decline associated with new reform policies. Previous research on welfare participation has very rarely included the disaggregated information recording policy heterogeneity in the coding scheme used in this study. Information about these newly coded policy changes will hopefully lead to further study of the relative importance of these policies and descriptive work documenting how they differentially affect subpopulations, including rates of transition into and out of welfare participation.

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Table 1: New Welfare Reform Strategies by Province (1986-2005)\*

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

\* See Berg and Gabel (2012) for a complete listing of source documents.

\*\* *Work requirements* require welfare participants to perform some form of work-related activity (such as volunteering or job search) or otherwise lose some or all welfare benefits. Work requirements are considered “weak” or “strong” according to whether sanctions for non-compliance could result in either complete elimination of welfare benefits or just a fraction (or none at all).

\*\*\* Diversion helps welfare applicants find alternatives to welfare, even if that means higher short-term costs for the province's welfare program. In some provinces, applicants were given one-time payments as a substitute for welfare enrollment so that short-term needs could be met while reducing the probability of future welfare participation. Diversion is considered “weak” if the primary focus of the policy is to inform welfare applicants of other means of assistance or employment opportunities; “strong” diversion involved direct (and often, innovative) strategies to reduce welfare participation.

\*\*\*\* *Earning exemptions* allow recipients to simultaneously collect welfare benefits and earn a limited amount of labor income to encourage employment.

\*\*\*\*\* *Time limits* restrict the duration of welfare eligibility, potentially inducing would-be participants to ration their use of welfare for the direct circumstances and more aggressively pursue labor income. In the case of British Columbia, for example, non-exempt individuals are eligible for welfare only two years out of every five-year period.

<sup>1</sup> The Supports for Independence program required welfare participants to look for work or obtain training, and failure to do so resulted in sanctions. 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. Therefore, these work requirements are coded as *weak*.

<sup>2</sup> Under the BC Benefits Act welfare participants were required to participate in work-related activity or have their benefits reduced.

<sup>3</sup> Through the Employment and Income Assistance program welfare participants are required to complete an Action Plan that laid out their work-related responsibilities. 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*.

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

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

<sup>6</sup> The Act Respecting Income Security provided welfare participants who engaged in work-related activity a bonus of roughly \$100 in additional welfare benefits. Since benefits cannot be fully

eliminated for non-participation in work-related activities, these "sanctions" are coded as weak.

<sup>7</sup> 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. Penalties for non-compliance were reportedly infrequent. Therefore, these work requirements are coded as *weak*.

<sup>8</sup> 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.

<sup>9</sup> 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).

<sup>10</sup> The Employment Support and Income Assistance Act requires welfare participants to enter an Employment Action Plan. 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.

<sup>11</sup> 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. This sanction increases to six months for subsequent offenses.

<sup>12</sup> The BC Benefits Act expected welfare applicants to have pursued all alternate sources of support before gaining access to welfare. The province was also temporarily successful in requiring new residents to wait three months before becoming eligible for assistance. 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*.

<sup>13</sup> 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. 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.

<sup>14</sup> 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.

<sup>15</sup> Under the Building Independence umbrella program welfare applicants are now processed through call centers. 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.

<sup>16</sup> Under the Supports for Independence program employable welfare applicants are now required to wait before gaining welfare eligibility. 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. 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.

<sup>17</sup> 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. Also, applicants are not eligible for welfare unless they can show they have worked for two years in succession.

<sup>18</sup> Ontario Works mandates that all welfare applicants pursue all other sources of income before eligibility to welfare can be obtained. 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.

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

<sup>20</sup> 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. 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: Description of Variables

<u>Variable</u>	<u>Description</u>	<u>Variables</u>	<u>Description</u>
<i>Dependent Variable</i>			
WELFARE_RECEIPT	if respondent received welfare in excess of 100 dollars	<i>Education Level</i> EDUC_HSDROP EDUC_HS EDUC_SOME_COLL EDUC_CERT EDUC_COLL EDUC_MASTER EDUC_PROF EDUC_PHD EDUC_NONRESP	if highest education level is below a high school diploma if highest education level is a high school diploma if highest education level is some college if highest education level is an undergraduate certificate if highest education level is a college degree if highest education level is a master's degree if highest education level is a professional degree if highest education is a doctoral degree if respondent did not indicate education level
<i>Policy*</i>			
NEWREFORM	welfare reform variables**		
logBENEFITS	log of real welfare benefit level for single parents with one child		
logASSET_THRESH	log of real asset exemption threshold		
logMINWAGE	log of real minimum wage		
logUNEMP_INS	log of real total employment insurance benefits, per non-elderly person		
<i>Province-level Macro*</i>			
UNEMPLOYMENT	unemployment rate	<i>Family Type</i> SINGLE ONE_KID_SINGLE TWO_KIDS_SINGLE THREEPLUS_KIDS_SINGLE COUPLED NO_KIDS_COUPLED ONE_KID_COUPLED TWO_KIDS_COUPLED THREEPLUS_KIDS_COUPLED FAMILY_NONRESP SINGLE_PARENT PARENT MOTHER FATHER MINORITY_MOTHER MINORITY_FATHER	if respondent is not married or common-law if respondent is single with one child at home if respondent is single with two children at home if respondent is single with three or more children at home if respondent is married or common-law if respondent is coupled with no children if respondent is coupled with one child at home if respondent is coupled with two children at home if respondent is coupled with three or more children at home if respondent did not indicate family type if respondent was single and a parent if respondent had children at home if respondent was female and a parent if respondent was male and a parent if respondent was female and a minority if respondent was male and a minority
UNEMPLOYMENT_{t-1}	unemployment rate, lagged one period		
UNEMPLOYMENT_{t-2}	unemployment rate, lagged two periods		
REALGDPGROWTH	real GDP growth rate		
REALGDPGROWTH_{t-1}	real GDP growth rate, lagged one period		
REALGDPGROWTH_{t-2}	real GDP growth rate, lagged two periods		
<i>Demographic</i>			
AGE	age of respondent		
18to22	if age is between 18 and 22		
23to30	if age is between 23 and 30		
31to40	if age is between 31 and 40		
41to50	if age is between 41 and 50		
51to60	if age is between 51 and 60		
61to64	if age is between 61 and 64		
MALE	if respondent is male		
MOVER***	if respondent changed province of residence		
NON-URBAN***	if respondent lives in urban area		
DISABILITY***	if respondent is disabled		
IN_SCHOOL***	if respondent attended school		
MINORITY***	if respondent is a minority		
NATIVE***	if respondent is a native Canadian (aboriginal)		
NON-ENGLISH***	if respondent's mother tongue is English		
IMMIGRANT***	if respondent is an immigrant		
YRS_IMM	years since immigrated to Canada	<i>Labor</i> UI_RECEIPT WKC_RECEIPT COMMISSION**** MANAGER**** EMPLOYED****	if respondent received unemployment insurance in excess of 100 dollars if respondent received workers compensation in excess of 100 dollars if respondent earned commission through employment if respondent held a managerial-type position if respondent was a paid worker

\* These are province-level variables

\*\* The main explanatory variable is NEWREFORM1, although other versions of the empirical models are estimated using three other weaker (i.e., more inclusive) reform measures discussed in detail in the body of the paper.

\*\*\* Non-respondents to survey were treated as follows: not to have changed provinces, not to be living in an urban area, not disabled, did not attend school in reference year, not a minority, not a native Canadian, having English as their mother tongue, and not an immigrant.

\*\*\*\* Non-respondents to survey were considered not on commission, not employed in managerial type positions, and not employed during the reference year, respectively.

Table 3: Summary Statistics\*, SLID Cross-Sectional

Variables**	Mean	Std Dev	Min	Max	Variables*	Mean	Std Dev	Min	Max
<i>Dependent Variable</i>					<i>Education Level</i>				
WELFARE_RECEIPT	0.092	0.29	0.00	1.00	EDUC_HSDROP	0.125	0.33	0.00	1.00
<i>Policy</i>					EDUC_HS	0.107	0.31	0.00	1.00
NEWREFORM	0.307	0.45	0.00	1.00	EDUC_SOME_COLL	0.100	0.30	0.00	1.00
logBENEFITS	9.670	0.12	9.46	9.99	EDUC_CERT	0.217	0.41	0.00	1.00
logASSET_THRESH	8.167	0.51	6.91	9.10	EDUC_COLL	0.073	0.26	0.00	1.00
logMINWAGE	2.015	0.10	1.78	2.17	EDUC_MASTER	0.014	0.12	0.00	1.00
logUNEMP_INS	6.385	0.51	5.62	7.81	EDUC_PROF	0.003	0.05	0.00	1.00
<i>Province-level Macro</i>					EDUC_PHD	0.003	0.06	0.00	1.00
UNEMPLOYMENT***	9.005	3.15	3.40	20.10	EDUC_NONRESP	0.357	0.48	0.00	1.00
REALGDPGROWTH***	3.004	2.00	-4.65	15.60	<i>Family Type</i>				
<i>Demographic</i>					SINGLE****	0.250	0.43	0.00	1.00
AGE	39.624	12.70	18.00	64.00	ONE_KID_SINGLE	0.025	0.16	0.00	1.00
18to22	0.110	0.31	0.00	1.00	TWO_KIDS_SINGLE	0.014	0.12	0.00	1.00
23to30	0.169	0.37	0.00	1.00	THREEPLUS_KIDS_SINGLE	0.005	0.07	0.00	1.00
31to40	0.248	0.43	0.00	1.00	COUPLED****	0.442	0.50	0.00	1.00
41to50	0.243	0.43	0.00	1.00	NO_KIDS_COUPLED	0.157	0.36	0.00	1.00
51to60	0.175	0.38	0.00	1.00	ONE_KID_COUPLED	0.102	0.30	0.00	1.00
61to64	0.055	0.23	0.00	1.00	TWO_KIDS_COUPLED	0.124	0.33	0.00	1.00
MALE	0.491	0.50	0.00	1.00	THREEPLUS_KIDS_COUPLED	0.060	0.24	0.00	1.00
MOVER	0.008	0.09	0.00	1.00	FAMILY_NONRESP	0.308	0.46	0.00	1.00
NON-URBAN	0.186	0.39	0.00	1.00	PARENT****	0.330	0.47	0.00	1.00
DISABILITY	0.117	0.32	0.00	1.00	SINGLE_PARENT****	0.044	0.21	0.00	1.00
IN_SCHOOL	0.075	0.26	0.00	1.00	MOTHER****	0.179	0.38	0.00	1.00
MINORITY	0.037	0.19	0.00	1.00	SINGLE_MOTHER****	0.034	0.18	0.00	1.00
NATIVE	0.023	0.15	0.00	1.00	MINORITY_MOTHER****	0.011	0.10	0.00	1.00
NON-ENGLISH	0.322	0.47	0.00	1.00	FATHER****	0.152	0.36	0.00	1.00
IMMIGRANT	0.107	0.31	0.00	1.00	SINGLE_FATHER****	0.010	0.10	0.00	1.00
YRS_IMM	1.586	6.89	0.00	.	MINORITY_FATHER****	0.009	0.09	0.00	1.00
<i>Years</i>					<i>Labor</i>				
Years	1993-2007				UI_RECEIPT	0.256	0.44	0.00	1.00
N	921,449				WKC_RECEIPT	0.056	0.23	0.00	1.00
					COMMISSION****	0.049	0.22	0.00	1.00
					MANAGER****	0.080	0.27	0.00	1.00
					EMPLOYED****	0.456	0.50	0.00	1.00

\* The statistics here use non-weighted data. Summary statistics using survey weights are presented in Appendix W.

\*\* Summary statistics for province- and year- fixed effects are not presented here although they are included in the empirical models.

\*\*\* Lagged versions of the macroeconomic variables, UNEMPLOYMENT and REALGDPGROWTH, are included in the empirical models. Summary statistics for these lagged variables are not presented in this table, because lagged and unlagged variables have (nearly) identical univariate distributions and summary statistics.

\*\*\*\* These variables do not appear as regressors in the main model. These variables are instead used to isolate the effects of our main independent variable (NEWREFORM) on certain subpopulations. Also note that SINGLE and COUPLED do not sum to 1 because a large portion of survey respondents non-responded (i.e., FAMILY\_NONRESP = 0.308).



Table 4: Five Empirical Models\* with Province and Year Fixed Effects

Variables	Estimated coefficients and absolute value <i>t</i> statistics for Models:									
	A	t	B	t	C	t	D	t	E	t
<i>Policy</i>										
NEWREFORM	-0.013	6.1	-0.011	5.2	-0.011	5.4	-0.011	5.2	-0.011	5.5
logBENEFITS	0.017	1.8	0.022	2.3	0.014	1.5	0.017	1.8	0.015	1.6
logASSET_THRESH	-0.004	3.0	-0.004	2.9	-0.003	2.2	-0.003	2.7	-0.003	2.6
logMINWAGE	0.013	1.4	0.010	1.1	0.009	1.1	0.007	0.8	0.009	1.1
logUNEMP_INS	0.001	0.1	-0.002	0.5	-0.002	0.4	0.002	0.5	0.002	0.3
<i>Province-level Macro</i>										
UNEMPLOYMENT	0.002	2.7	0.002	2.2	0.002	2.3	0.002	2.5	0.002	2.7
UNEMPLOYMENT_{t-1}	0.000	0.0	0.000	0.0	0.000	0.1	0.000	0.3	0.000	0.3
UNEMPLOYMENT_{t-2}	0.002	2.7	0.003	3.1	0.002	2.8	0.002	2.8	0.002	2.8
REALGDPGROWTH	0.000	1.9	0.000	1.4	0.000	1.8	0.000	1.8	0.000	1.9
REALGDPGROWTH_{t-1}	-0.001	3.2	-0.001	2.5	-0.001	3.1	-0.001	3.1	-0.001	3.2
REALGDPGROWTH_{t-2}	0.000	1.5	0.000	1.1	0.000	1.6	0.000	2.0	0.000	2.0
<i>Demographic</i>										
18to22			0.052	32.7	0.051	32.0	0.024	14.9	0.031	19.0
23to30			0.034	23.1	0.052	35.6	0.035	23.5	0.042	28.4
31to40			0.013	9.0	0.032	22.5	0.015	10.4	0.020	14.0
41to50			-0.001	0.8	0.015	10.9	0.000	0.3	0.004	3.0
51to60			-0.002	1.2	0.008	5.7	0.005	3.3	0.008	5.3
MALE			-0.021	35.1	-0.023	39.4	-0.017	28.6	-0.016	26.8
MOVER			0.005	1.4	0.013	3.8	0.010	3.0	0.012	3.6
NON-URBAN			-0.008	9.8	-0.013	16.2	-0.009	11.2	-0.007	8.8
DISABILITY			0.167	176.3	0.159	167.1	0.153	163.0	0.155	164.5
IN_SCHOOL			-0.036	30.4	-0.010	8.1	-0.020	16.2	-0.020	15.8
MINORITY			0.024	13.5	0.028	15.9	0.023	13.3	0.022	12.8
NATIVE			0.119	59.7	0.110	55.4	0.096	48.8	0.097	49.4
NON-ENGLISH			0.007	7.3	0.003	2.9	0.006	7.1	0.008	9.0
IMMIGRANT			0.014	9.8	0.012	8.3	0.013	8.8	0.011	7.9
YRS_IMM			-0.001	20.5	-0.001	15.2	-0.001	15.5	-0.001	15.2
<i>Education Level</i>										
EDUC_HS					-0.090	73.4	-0.087	71.2	-0.088	72.5
EDUC_SOME_COLL					-0.084	63.5	-0.084	64.4	-0.086	66.2
EDUC_CERT					-0.112	104.6	-0.107	101.4	-0.109	103.1
EDUC_COLL					-0.141	100.1	-0.132	94.4	-0.137	98.1
EDUC_MASTER					-0.135	51.5	-0.124	47.9	-0.131	50.6
EDUC_PROF					-0.134	23.2	-0.121	21.4	-0.130	22.9
EDUC_PHD					-0.134	26.7	-0.122	24.7	-0.130	26.3
EDUC_NONRESP					-0.065	59.0	-0.048	30.2	-0.050	31.4
<i>Family Type</i>										
ONE_KID_SINGLE							0.135	68.6	0.137	69.4
TWO_KIDS_SINGLE							0.163	64.5	0.165	65.2
THREEPLUS_KIDS_SINGLE							0.222	54.8	0.223	55.2
NO_KIDS_COUPLED							-0.070	66.6	-0.067	63.4
ONE_KID_COUPLED							-0.051	43.2	-0.044	37.1
TWO_KIDS_COUPLED							-0.049	43.0	-0.044	38.4
THREEPLUS_KIDS_COUPLED							-0.022	15.1	-0.017	12.0
FAMILY_NONRESP							-0.049	28.7	-0.047	27.6
<i>Labor</i>										
UI_RECEIPT									-0.032	45.9
WKC_RECEIPT									-0.039	31.3
Constant	-0.109	1.2	-0.151	1.7	-0.023	0.3	-0.026	0.3	-0.007	0.1
Province Fixed Effects	Yes		Yes		Yes		Yes		Yes	
Year Fixed Effects	Yes		Yes		Yes		Yes		Yes	
R-Squared	0.0092		0.0502		0.0653		0.0890		0.0921	

\* For ease of interpreting marginal effects independent of the value of right-hand-side characteristics, this table reports estimates based on the linear probability model specification. Logit models using the same sets of variables were also estimated, which are reported in Appendix L. Probit versions are also available upon request. The results are qualitatively very similar and rarely overturn findings of large versus small magnitudes, signs, or statistical significance

Table 5: The Effect of New Reform Strategies in 46 Subpopulations\*

Estimated Among Subsample:	Estimated coefficients for NEWREFORM and absolute value t statistics, for Model E:				Estimated Among Subsample:	Estimated coefficients for NEWREFORM and absolute value t statistics, for Model E:			
	LPM	t	LOGIT	z		LPM	t	LOGIT	z
All Population	-0.011	5.5	-0.168	5.8	Family Type	-0.031	6.3	-0.287	5.92
Demographic					SINGLE	-0.062	3.1	-0.341	2.7
18to22	-0.025	3.6	-0.259	3.3	ONE_KID_SINGLE	0.013	0.5	0.070	0.4
23to30	-0.016	3.0	-0.189	2.8	TWO_KIDS_SINGLE	-0.122	2.8	-0.776	3.1
31to40	-0.004	1.1	-0.049	0.8	THREEPLUS_KIDS_SINGLE	-0.009	3.7	-0.214	3.9
41to50	-0.009	2.2	-0.124	2.0	COUPLED	0.002	0.5	-0.074	0.71
51to60	-0.006	1.2	-0.165	2.3	NO_KIDS_COUPLED	-0.020	3.7	-0.392	3.6
61to64	-0.019	2.1	-0.209	1.8	ONE_KID_COUPLED	-0.015	3.3	-0.286	2.6
MALE	-0.010	3.6	-0.164	3.8	TWO_KIDS_COUPLED	-0.002	0.2	-0.044	0.4
FEMALE	-0.013	4.2	-0.178	4.6	THREEPLUS_KIDS_COUPLED	-0.019	5.4	-0.248	4.8
MOVER	0.021	1.0	0.253	0.7	PARENT	-0.051	3.5	-0.290	3.2
NON-URBAN	-0.025	4.9	-0.439	5.3	SINGLE_PARENT	-0.020	4.0	-0.243	3.7
DISABILITY	-0.025	3.0	-0.188	3.0	MOTHER	-0.055	3.2	-0.280	2.8
IN_SCHOOL	-0.025	4.0	-0.354	3.0	SINGLE_MOTHER	0.001	0.0	-0.111	0.4
MINORITY	-0.014	1.3	-0.215	1.5	MINORITY_MOTHER	-0.017	3.6	-0.272	3.18
NATIVE	-0.027	1.4	-0.045	0.3	FATHER	-0.041	1.5	-0.346	1.5
NON-ENGLISH	-0.001	0.3	-0.093	1.5	SINGLE_FATHER	-0.013	0.7	-0.030	0.1
IMMIGRANT	-0.021	3.4	-0.324	3.6	MINORITY_FATHER	0.002	0.4	0.025	0.36
Education					FAMILY_NONRESP				
EDUC_HSDROP	-0.027	3.3	-0.253	3.8	Labor				
EDUC_HS	-0.022	3.7	-0.289	3.1	COMMISSION	-0.020	2.8	-0.414	2.5
EDUC_SOME_COLL	-0.019	3.0	-0.214	2.4	MANAGER	-0.006	1.6	-0.267	1.3
EDUC_CERT	-0.017	4.5	-0.274	3.7	EMPLOYED	-0.015	6.4	-0.292	5.2
EDUC_COLL	-0.003	0.7	-0.145	0.7					
EDUC_MASTER	0.023	2.8	1.073	2.1					
EDUC_PROF	-0.004	0.2	1.200	0.7					
EDUC_PHD	0.000	0.0	3.850	1.2					
EDUC_NONRESP	-0.013	3.0	-0.169	3.3					

\* Subpopulations are overlapping but reported separately in an attempt to describe, using standard demographic measures, the subpopulations that were most and least affected by welfare reform in Canada. Table 5 presents only the coefficients on NEWREFORM from Model E with province and year fixed effects, estimated 46 times using different subsamples. Coefficients and the empirical distribution of the error term are theoretically and empirically distinct for each subpopulation and represent different models. Nevertheless, all models use nearly identical lists of variables, dropping only those regressors that have no variation within a particular subpopulation (i.e., FEMALE is dropped from the regression using the subsample of MOTHERS). The right-hand side variable used to identify the subsample was in each case dropped as well. Logit estimates reported here are raw logit coefficients rather than marginal effects.

Appendix W: Weighted Versus Unweighted Unconditional Means\*

<i>Variables**</i>	<i>Weighted</i>		<i>Unweighted</i>		<i>Std Dev**</i>	<i>Variables*</i>	<i>Weighted</i>		<i>Unweighted</i>		<i>Std Dev**</i>
	<i>Mean</i>	<i>SE</i>	<i>Mean</i>	<i>SE</i>			<i>Mean</i>	<i>SE</i>	<i>Mean</i>	<i>SE</i>	
<i>Dependent Variable</i>											
WELFARE_RECEIPT	0.096		0.092		0.29	<i>Education Level</i>	0.125		0.125		0.33
						EDUC_HSDROP	0.118		0.107		0.32
						EDUC_HS	0.116		0.100		0.32
						EDUC_SOME_COLL	0.233		0.217		0.42
						EDUC_CERT	0.096		0.073		0.29
						EDUC_COLL	0.021		0.014		0.14
						EDUC_MASTER	0.004		0.003		0.06
						EDUC_PROF	0.005		0.003		0.07
						EDUC_PHD	0.281		0.357		0.45
						EDUC_NONRESP					
						<i>Family Type</i>					
						SINGLE	0.306		0.250		0.46
						SINGLE_KID_SINGLE	0.027		0.025		0.16
						TWO_KIDS_SINGLE	0.016		0.014		0.12
						THREEPLUS_KIDS_SINGLE	0.006		0.005		0.08
						COUPLED	0.484		0.442		0.50
						NO_KIDS_COUPLED	0.165		0.157		0.37
						ONE_KID_COUPLED	0.114		0.102		0.32
						TWO_KIDS_COUPLED	0.141		0.124		0.35
						THREEPLUS_KIDS_COUPLED	0.063		0.060		0.24
						FAMILY_NONRESP	0.210		0.308		0.41
						PARENT	0.367		0.330		0.48
						SINGLE_PARENT	0.048		0.044		0.21
						MOTHER	0.200		0.179		0.40
						SINGLE_MOTHER	0.038		0.034		0.19
						MINORITY_MOTHER	0.027		0.011		0.16
						FATHER	0.168		0.152		0.37
						SINGLE_FATHER	0.010		0.010		0.10
						MINORITY_FATHER	0.021		0.009		0.15
						<i>Labor</i>					
						UI_RECEIPT	0.212		0.256		0.41
						WKC_RECEIPT	0.055		0.056		0.23
						COMMISSION	0.044		0.049		0.20
						MANAGER	0.090		0.080		0.29
						EMPLOYED	0.488		0.456		0.50
						Years					
						N	1993-2007				
							921,449				

\* The statistics here are the product of data using sample weights. There are some notable differences with the unweighted statistics. For instance, the mean for NEWREFORM1 is 50 percent larger as compared with the unweighted sample. This suggests that sampling was initially more uniform across provinces, despite a majority of the population being found in the provinces of Alberta, British Columbia, and Ontario, where new reform strategies are present. In addition, there are significantly more disabled individuals, minorities, immigrants, and single parents in the weighted sample.

Appendix L: Estimated Logit Models with Province and Year Fixed Effects Models

Variables	Estimated coefficients and absolute value <i>t</i> statistics for Models:									
	A	z	B	z	C	z	D	z	E	z
<i>Policy</i>										
NEWREFORM	-0.179	6.6	-0.155	5.6	-0.160	5.7	-0.162	5.6	-0.168	5.8
logBENEFITS	0.149	1.3	0.218	1.8	0.141	1.2	0.159	1.3	0.126	1.0
logASSET_THRESH	-0.021	1.3	-0.023	1.4	-0.015	0.9	-0.028	1.6	-0.028	1.6
logMINWAGE	-0.096	0.8	-0.129	1.1	-0.166	1.4	-0.269	2.2	-0.214	1.8
logUNEMP_INS	0.262	4.0	0.259	3.8	0.251	3.6	0.389	5.5	0.377	5.3
<i>Macroeconomic</i>										
UNEMPLOYMENT	0.004	0.4	-0.003	0.3	0.001	0.1	-0.003	0.2	0.000	0.0
UNEMPLOYMENT_{t-1}	0.010	0.8	0.009	0.7	0.012	1.0	0.007	0.5	0.007	0.5
UNEMPLOYMENT_{t-2}	0.035	3.4	0.043	4.1	0.041	3.8	0.043	4.0	0.042	3.8
REALGDPGROWTH	-0.001	0.4	0.001	0.3	0.000	0.2	0.002	0.7	0.002	0.6
REALGDPGROWTH_{t-1}	-0.006	2.2	-0.004	1.5	-0.005	2.0	-0.005	1.8	-0.005	1.8
REALGDPGROWTH_{t-2}	0.000	0.2	0.002	0.7	0.001	0.2	0.000	0.0	0.000	0.0
<i>Demographic</i>										
18to22			0.629	32.8	0.636	32.4	0.308	15.1	0.388	18.9
23to30			0.425	23.5	0.675	36.3	0.453	23.7	0.535	27.8
31to40			0.163	9.3	0.407	22.7	0.187	10.0	0.246	13.1
41to50			-0.028	1.6	0.180	10.0	-0.004	0.2	0.046	2.5
51to60			-0.029	1.6	0.088	4.8	0.051	2.7	0.088	4.7
MALE			-0.265	35.4	-0.299	39.6	-0.224	28.7	-0.205	26.1
MOVER			0.058	1.3	0.200	4.4	0.140	3.0	0.156	3.3
NON-URBAN			-0.113	10.8	-0.178	16.0	-0.120	10.4	-0.094	8.1
DISABILITY			1.612	168.7	1.555	157.7	1.554	152.6	1.571	152.6
IN_SCHOOL			-0.493	29.2	-0.085	4.6	-0.222	11.7	-0.218	11.4
MINORITY			0.349	15.6	0.445	19.4	0.385	16.3	0.366	15.4
NATIVE			1.076	57.2	1.012	52.3	0.906	44.9	0.918	45.3
NON-ENGLISH			0.084	7.4	0.047	4.1	0.101	8.5	0.121	10.2
IMMIGRANT			0.192	11.0	0.149	8.5	0.149	8.4	0.135	7.6
YRS_IMM			-0.020	22.8	-0.016	17.6	-0.016	17.1	-0.015	16.5
<i>Education Level</i>										
EDUC_HS					-0.874	58.4	-0.874	56.6	-0.886	57.3
EDUC_SOME_COLL					-0.784	49.7	-0.831	51.3	-0.853	52.4
EDUC_CERT					-1.244	93.4	-1.251	90.6	-1.263	91.2
EDUC_COLL					-2.349	75.4	-2.297	72.8	-2.351	74.5
EDUC_MASTER					-2.323	32.9	-2.236	31.4	-2.315	32.5
EDUC_PROF					-2.503	13.8	-2.395	13.1	-2.491	13.6
EDUC_PHD					-2.710	15.2	-2.607	14.5	-2.700	15.0
EDUC_NORESP					-0.536	44.5	-0.351	18.6	-0.369	19.5
<i>Family Type</i>										
ONE_KID_SINGLE							1.015	53.8	1.034	54.6
TWO_KIDS_SINGLE							1.240	52.9	1.265	53.7
THREEPLUS_KIDS_SINGLE							1.598	45.6	1.622	46.1
NO_KIDS_COUPLED							-1.146	69.3	-1.101	66.4
ONE_KID_COUPLED							-0.724	42.2	-0.638	36.9
TWO_KIDS_COUPLED							-0.781	44.8	-0.711	40.5
THREEPLUS_KIDS_COUPLED							-0.252	12.9	-0.193	9.8
FAMILY_NONRESP							-0.607	29.1	-0.583	27.9
<i>Labor</i>										
UI_RECEIPT									-0.387	40.0
WKC_RECEIPT									-0.500	27.3
Constant	-5.608	5.4	-6.454	6.0	-5.239	4.9	-5.419	4.9	-5.109	4.6
Province Fixed Effects	Yes		Yes		Yes		Yes		Yes	
Year Fixed Effects	Yes		Yes		Yes		Yes		Yes	
Pseudo R-Squared	0.0152		0.0741		0.1019		0.1369		0.1414	

Appendix R: Alternate Specifications and Subsamples

Variables	Estimated coefficients and absolute value t statistics using Model E+PROV+YR:											
	(1) Robust	t	(2) Clustered*	t	(3) Weighted**	t	(4) Single Observation***	t	(5) Individual FE****	t	(6) Non-Disabled*****	t
<i>Policy</i>												
NEWREFORM	-0.011	5.6	-0.011	2.4	-0.015	4.7	-0.005	-0.9	-0.009	4.4	-0.009	4.2
logBENEFITS_SINGLE_ONECHILD	0.015	1.6	0.015	0.6	0.011	0.7	0.089	4.1	0.024	2.4	0.029	3.1
logASSET_THRESH	-0.003	2.8	-0.003	0.7	-0.009	5.0	0.002	0.4	-0.005	4.0	-0.005	3.9
logMINWAGE	0.009	1.1	0.009	0.3	-0.015	1.2	-0.020	0.9	0.015	1.5	0.006	0.7
logUNEMP_INS	0.002	0.4	0.002	0.1	-0.003	0.5	-0.003	0.2	0.003	0.6	-0.001	0.1
<i>Macroeconomic</i>												
UNEMPLOYMENT	0.002	2.8	0.002	0.9	0.004	2.8	0.001	0.6	0.002	3.1	0.003	3.3
UNEMPLOYMENT_{t-1}	0.000	0.3	0.000	0.2	-0.002	1.2	0.001	0.4	0.000	0.4	0.000	0.1
UNEMPLOYMENT_{t-2}	0.002	2.8	0.002	1.0	0.002	1.8	0.004	2.4	0.001	1.5	0.002	2.6
REALGDPGROWTH	0.000	1.8	0.000	0.8	0.000	0.4	0.000	0.3	0.000	1.2	0.000	2.0
REALGDPGROWTH_{t-1}	-0.001	3.2	-0.001	1.5	-0.001	3.3	0.000	0.5	0.000	2.8	-0.001	3.0
REALGDPGROWTH_{t-2}	0.000	1.9	0.000	0.8	0.000	0.1	0.001	1.5	0.000	0.8	0.000	2.1
<i>Demographic</i>												
18to22	0.031	17.0	0.031	3.1	0.011	3.9	0.028	9.5	0.020	4.9	0.028	17.0
23to30	0.042	26.5	0.042	4.5	0.027	11.0	0.027	9.9	0.008	2.2	0.025	16.4
31to40	0.020	13.2	0.020	2.6	0.023	9.4	-0.005	2.0	-0.006	1.8	-0.003	2.1
41to50	0.004	2.8	0.004	0.6	0.009	3.8	-0.023	8.8	-0.004	1.6	-0.019	13.0
51to60	0.008	5.1	0.008	1.0	0.013	5.6	-0.013	4.6	-0.001	0.8	-0.011	7.1
MALE	-0.016	27.3	-0.016	17.0	-0.012	12.9	-0.024	21.7	.	.	-0.015	25.8
MOVER	0.012	3.8	0.012	4.2	0.001	0.2	0.008	0.4	0.009	3.7	0.015	4.6
NON-URBAN	-0.007	9.3	-0.007	1.8	-0.014	12.9	-0.006	1.3	0.000	0.0	-0.005	5.6
DISABILITY	0.155	122.7	0.155	14.9	0.163	83.0	0.307	109.9	0.009	10.0	.	.
IN_SCHOOL	-0.020	17.4	-0.020	5.6	-0.022	12.5	-0.020	3.4	0.008	7.2	-0.013	10.5
MINORITY	0.022	12.9	0.022	2.5	0.026	10.0	0.020	2.3	.	.	0.021	12.1
NATIVE	0.097	36.5	0.097	5.1	0.090	23.0	0.116	12.0	.	.	0.097	46.9
NON-ENGLISH	0.008	8.8	0.008	1.7	0.003	1.7	0.015	8.7	.	.	0.005	5.3
IMMIGRANT	0.011	7.4	0.011	1.1	0.034	13.4	-0.001	0.7	.	.	0.015	10.8
YRS_IMM	-0.001	16.5	-0.001	3.6	-0.002	18.5	-0.001	3.0	0.000	0.3	-0.001	13.1
<i>Education Level</i>												
EDUC_HS	-0.088	65.2	-0.088	10.0	-0.092	40.7	-0.069	10.7	-0.002	0.6	-0.071	56.6
EDUC_SOME_COLL	-0.086	58.4	-0.086	8.8	-0.096	40.1	-0.080	11.6	-0.006	2.3	-0.071	52.9
EDUC_CERT	-0.109	91.0	-0.109	8.6	-0.119	59.8	-0.098	16.0	-0.017	5.7	-0.088	80.1
EDUC_COLL	-0.137	109.7	-0.137	9.5	-0.147	68.5	-0.123	14.7	-0.005	1.2	-0.112	79.4
EDUC_MASTER	-0.131	79.1	-0.131	9.5	-0.144	52.5	-0.116	6.5	0.002	0.2	-0.105	41.0
EDUC_PROF	-0.130	45.6	-0.130	8.1	-0.136	29.2	-0.120	3.1	-0.030	2.0	-0.107	19.3
EDUC_PHD	-0.130	57.6	-0.130	6.3	-0.146	40.2	-0.132	3.3	-0.012	0.8	-0.110	22.7
EDUC_NONRESP	-0.050	27.4	-0.050	7.3	-0.050	16.0	-0.022	3.7	-0.007	1.9	-0.041	25.9
<i>Family Type</i>												
ONE_KID_SINGLE	0.137	46.7	0.137	7.6	0.107	24.0	0.115	12.3	0.091	39.6	0.161	78.2
TWO_KIDS_SINGLE	0.165	42.9	0.165	6.2	0.135	23.6	0.154	10.6	0.108	35.3	0.192	74.2
THREEPLUS_KIDS_SINGLE	0.223	34.2	0.223	7.3	0.204	20.4	0.209	8.9	0.106	22.1	0.253	61.4
NO_KIDS_COUPLED	-0.067	65.0	-0.067	6.9	-0.078	45.8	-0.035	6.8	-0.004	2.6	-0.029	27.1
ONE_KID_COUPLED	-0.044	37.2	-0.044	4.8	-0.064	34.5	0.006	0.9	0.013	7.7	-0.006	4.9
TWO_KIDS_COUPLED	-0.044	39.8	-0.044	4.2	-0.062	35.8	0.039	5.1	0.019	10.0	-0.009	7.6
THREEPLUS_KIDS_COUPLED	-0.017	11.9	-0.017	1.4	-0.038	17.0	0.078	7.2	0.026	10.5	0.015	10.7
FAMILY_NONRESP	-0.047	25.3	-0.047	5.1	-0.068	22.0	-0.056	9.8	-0.001	0.2	-0.015	9.2
<i>Labor</i>												
UI_RECEIPT	-0.032	47.1	-0.032	3.7	-0.029	28.2	-0.037	28.5	-0.008	11.1	-0.022	32.6
WKC_RECEIPT	-0.039	32.1	-0.039	6.8	-0.044	23.7	-0.044	16.7	-0.009	7.0	-0.012	8.9
Constant	-0.007	0.1	-0.007	0.1	0.194	1.4	-0.696	3.4	-0.161	1.7	-0.141	1.7
N	921,449		921,449		921,449		310,554		610,895		813,491	
Province Dummies	Yes		Yes		Yes		Yes		Yes		Yes	
Year Dummies	Yes		Yes		Yes		Yes		Yes		Yes	
R-Squared	0.0921		0.0921		0.0921		0.0560		0.0368		0.0564	

\* The most conservative estimates reported earlier were produced by clustering according to province allowing for within-province autocorrelation.

\*\* Estimates using SLID sample weights.

\*\*\* In this column, the model was estimated using a subsample that included only respondents who had just one observation.

\*\*\*\* Estimates using individual fixed effects (unbalanced panel with gaps) including only respondents observed two or more times. There are 134,932 distinct individuals observed an average of 4.5 times. Without the inclusion of individual fixed effects, the estimate for NEWREFORM was equal to -0.015 using only this subsample.

\*\*\*\*\* Estimates using only individuals who did not identify themselves as disabled.