

Did Canadian welfare reform work? The effects of new reform strategies on social assistance participation

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Abstract. This paper measures the extent to which declines in social assistance (SA) participation were associated with novel and aggressive reforms referred to as new reform strategies: work requirements, diversion, earning exemptions and time limits. Controlling for province-specific benefit levels, eligibility requirements, GDP growth, labour market conditions and demographics, SA participation rates were more than one percentage point lower (equivalent to a 13% decline) in provinces with new reforms. Work requirements with strong sanctions had the sharpest negative associations. New reform strategies explain at least 10% of observed declines in SA participation, twice that of benefit levels and eligibility requirements.

Résumé. *Est-ce que la réforme de l'aide sociale est un succès? Les effets des nouvelles stratégies de réforme sur la participation à l'aide sociale.* Ce mémoire mesure la taille du déclin de la participation à l'aide sociale (AS) associée aux réformes inédites et agressives qu'on a nommées nouvelles stratégies de réforme: travail requis, diversion vers d'autres programmes, exemptions de gains, et limites temporelles. Normalisés pour tenir compte des niveaux de prestation spécifiques aux provinces, pour les conditions d'éligibilité, pour la croissance du PIB, pour les conditions du marché du travail et la situation démographique, les taux de participation à l'aide sociale étaient plus d'un point de pourcentage plus bas (ce qui équivalait à un déclin de 13 %) dans les provinces à la suite des nouvelles réformes. Les conditions de travail requis et les fortes sanctions attendantes ont eu l'impact négatif le plus fort. Les nouvelles stratégies de réforme expliquent au moins 10 % du déclin dans la participation à l'AS, soit le double de l'impact des changements dans les niveaux de prestation et des conditions d'éligibilité.

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1. Introduction

During the 1990s and 2000s, Canada's social assistance (SA) system¹ transitioned from a relatively centralized program with federal administrative controls to a decentralized mix of programs in which provinces had considerable discretion to undertake new policies. This transition led to substantially different SA programs across provinces and years, reflecting heterogeneity in the composition and timing of provinces' attempts at reducing the number of SA recipients. Passage of the Canada Health and Social Transfer (CHST) in 1996 created a new block-grant funding mechanism and removed most federal rules concerning how provinces managed their SA systems. Changes in provinces' SA programs did not occur at the same times, however, and were far from uniform in content and stringency of implementation.² Some provincial governments experimented aggressively with new policy tools aimed at reducing SA participation. Others did not. In different years and by different amounts, nearly all provinces reduced SA benefit levels and tightened eligibility requirements. The phrase standard tools is introduced to distinguish benefit levels and eligibility requirements (which have been studied extensively in multiple literatures spanning several major subfields of economics) from the policy tools that are the focus of this paper: work requirements, diversion, earnings exemptions and time limits (described in more detail in subsequent sections), which are jointly referred to as new reform strategies. Heterogeneous adoption decisions, adoption dates and stringency of enforcement regarding these new reform strategies overlapped in different ways with benefit reductions and tightening of eligibility requirements, potentially obscuring their effects on SA participation.

In 1994, Canada's SA participation rate reached a high of 12.5% of the non-elderly adult population and thereafter began to decline two years prior to passage of the CHST. Following passage of the CHST, SA participation continued to decline and remained substantially lower. This imperfectly overlapping timing raises questions as to what role, if any, did new reform strategies undertaken by provinces play in observed declines in SA participation.

This paper attempts to address this question by measuring disaggregated effects of new reform strategies on provinces' SA participation rates, while controlling for changes in benefit levels, eligibility requirements, labour market conditions, GDP growth and demographic composition. All variables, including GDP growth and labour market conditions, are province- and year-specific. Heterogeneity of provinces' adoption decisions and adoption dates can be considered as

1 Social assistance refers to government programs that provide cash benefits to individuals with low incomes, referred to in the US as *welfare* or the Temporary Assistance For Needy Families (TANF) block grant.

2 There were no federal mandates under Canada's CHST, with the exception that provinces were not allowed to impose residency requirements for SA. In contrast, the US's *Personal Responsibility and Work Opportunity Reconciliation Act* (PRWORA) required a specific set of new policies for all states: five-year time limits on welfare participation, work requirements for a minimum proportion welfare clients and restrictions that limited a state's ability to reduce benefit levels.

multiple natural experiments. These natural experiments provide valuable statistical information with which to measure the effects of new reform strategies even though benefit levels and eligibility requirements were changing over the same years.

A substantial literature documents the important effects of benefit levels and eligibility requirements on SA participation. Allen (1993) uses micro-data to show that differences in benefit levels and asset exemption levels among provinces have statistically and economically significant effects matching the predictions of theory. Dooley's (1999) longitudinal micro-data study of single mothers similarly finds that benefit levels relative to wages (while controlling for age and family structure) explain a large share of variation in SA participation decisions among this important subpopulation. Christofides et al. (1997) and Christofides (2000), however, argue that changes in wages and personal characteristics may be more important than changes in benefit levels and other institutional variables used to characterize SA programs. Klassen and Buchanan (1997) focus on eligibility requirements and find that labour market conditions influence SA participation rates more powerfully than eligibility requirements do.³

Compared to the substantial literature focused on benefit levels and eligibility requirements, few studies have attempted to measure the effects of work requirements, diversion, earnings exemptions and time limits (i.e., new reform strategies) as implemented in Canada and compare their effect size to that of benefit levels and eligibility requirements. The heterogeneity of provinces' new reform strategies that makes these policy variables potentially rich with statistical information also presents a formidable challenge. This paper attempts to address the challenge of coding heterogeneous SA program rules, enforcement practices and their timing into variables that can be operationalized within an otherwise standard econometric model. Finnie and Irvine (2008) provide a useful discussion of the potentially important role that new reform strategies might have played in influencing SA participation rates. Using micro-data to study the effects of unemployment benefits and SA benefits on entry and exit, Finnie and Irvine's (2008) econometric strategy attempts to capture potentially confounding unobserved variation in new reform strategies by using year fixed effects. The intent of this paper is to complement their approach by utilizing additional sources of information about provinces' adoption decisions, timing and stringency of enforcement concerning the four new reform policy variables.

Kneebone and White (2009) introduce an aggregated variable referred to as Administrative Procedures, which is an indicator that "turns on" from 0 to 1 for province-years in which strong administrative procedures for reducing SA participation were in effect.⁴ We undertake to implement a more disaggregated coding methodology that maps a substantial body of source material (published

3 Blank (2001, 2002), Acs et al. (2005) and Ribar (2005) investigate the determinants of US welfare participation focusing on new reform strategies described in this paper while controlling for benefit levels.

4 Shannon (2009) similarly coded provinces into categories that distinguish aggressive versus non-aggressive reforms in the context of explaining labour supply decisions. See also Green and

by provincial governments and third-party analyses of stringency of enforcement in different province-years) into policy variables measuring the presence of new reform strategies. Coding this additional information enables our empirical models to more precisely quantify which among these policy mechanisms are most strongly associated with the observed declines in provinces' SA participation rates.

The empirical models presented below use data covering the 24-year period from 1986 to 2009 with the "province-year" as the unit of observation.⁵ By incorporating the years 2004 to 2009, the estimates reported in this paper more fully reflect British Columbia's aggressive implementation of new reform strategies that began in 2002, as well as those adopted by Nova Scotia and, to a lesser extent, Saskatchewan, in 2001.

Table 1 summarizes new reform strategies adopted in the provinces since 1986. Documents released by provincial SA agencies and numerous other sources guided the taxonomy laid out in table 1. The categories for classifying new reform strategies are: work requirements with *strong* sanctions for non-compliance, work requirements with *weak* sanctions, *strong* diversion (of those who seek to enter the SA program by guiding them to alternative sources of support), *weak* diversion, earnings exemptions⁶ (aimed at encouraging work) and time limits (that cap the duration for which recipients can receive benefits).⁷ According to table 1, most provinces pursued some type of new reform strategy, although the stringency of sanctions used to enforce work requirements and diversion varied in important ways.⁸

The paper proceeds as follows. Section 2 describes Canadian SA participation rates at the national and provincial levels and documents differences in benefit levels and eligibility requirements, income growth and unemployment rates and adoption of new reform strategies across provinces and years. These groups of variables—standard SA reform tools, labour market policy tools, macroeconomic factors and new reform strategies—serve as four competing categories of information to explain the observed reductions in SA participation that took place from 1994 through 2009. Section 3 presents summary statistics and specifies the

Warburton (2004), who examine the effects of diversion strategies in BC on long-run SA participation.

5 At the time of writing, Canada's National Council of Welfare had published SA participation counts broken out by province only through 2009. In 2012, the National Council of Welfare was defunded by the Canadian federal government and was no longer in operation.

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

7 Note that the adjective "new" is slightly misleading in the case of earnings exemptions because some provinces experimented with them decades earlier. We classify earning exemptions as "new reform strategies" to facilitate comparisons with recent social assistance reforms in US. Until the passage of PRWORA, earnings of SA participants were typically taxed at upwards of 100%, generating a strong disincentive to work.

8 Source material and the method for coding weak versus strong are discussed in the following section and in online appendix A.

TABLE 1
New reform strategies by implementation date (1986–2009)

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

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

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

³Through the Employment and Income Assistance program, SA recipients are required to complete an Action Plan that laid out their work-related responsibilities (NCW 1997). Failure to fulfil one's Action Plan results 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.

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

⁵Under the *Social Assistance Act*, SA participants are required to look for work, attend school or take part in job training classes (Government of Prince Edward Island, PEI, 2003). Penalties for non-compliance were reportedly infrequent. Therefore, these reforms are coded as weak.

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

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

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

⁹The *Employment and Assistance Act*, which replaces BC Benefits, requires SA recipients 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) (Government of British Columbia, BC, 2002).

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

¹¹Under the Ontario Works program, SA recipients 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 (Government of Ontario, ON, 2008). This sanction increases to six months for subsequent offenses.

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

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

¹⁴The *Social Assistance Act* requires that SA 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 entering SA (PEI 2003).

¹⁵Under the Building Independence umbrella program, SA applicants are processed through call centres (Government of Saskatchewan, SK, 2002). Rather than enroll applicants into SA 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.

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

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

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

¹⁹In addition to in 1986–1995, British Columbia again put earnings exemptions in place (temporarily) between 2001 and 2002 (NCW 2002, 2003). In 2003, however, the province eliminated all earning exemptions (NCW 2004). Since then, SA participants are subject to a marginal tax rate of 100% on all labour market earnings.

²⁰In 2002, British Columbia implemented a time limit stipulating that applicants could receive benefits for a maximum of two years out of every five-year period (BC 2002). Since that time, however, 25 classes of individuals have been exempted from such restrictions, including single parents with a child younger than three years of age.

empirical models used to estimate the effects of these explanatory variables on SA participation. Section 4 presents empirical results based on finely disaggregated new reform variables that code the information collected from ministerial sources summarized in table 1. The robustness of the new information revealed by the dis-

aggregated multi-dimensional representation is investigated by comparing those findings with alternate model specifications using a scalar-valued (more coarsely measured) new reform variable and more general dynamic specifications. Section 5 concludes with discussion and interpretations of the empirical findings.

2. Declining social assistance participation and concurrent policy change

Social assistance participation in Canadian provinces

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

Table 2 computes changes in SA participation rates in levels (i.e., in units of percentage points) and percentage declines by province from 1994 (the year in which Canada's national rate of SA participation peaked at 12.5%) to 2009. Despite heterogeneity among provinces' SA programs as seen in both figure 1 and table 1, every province experienced large declines in SA participation since 1994, which leaves open the possibility that macroeconomic factors common across provinces were also responsible for a portion of the observed declines. Heterogeneity across provinces is clearly visible in both figure 1 and table 1, however. Alberta's SA participation rate declined by more than 66% while Newfoundland's declined by less than 31%. Ontario had the largest absolute decline in SA participation rates, dropping by 7.8 percentage points.

Standard reform tool no. 1: Reductions in social assistance benefits

Each province has its own formula mapping household type (i.e., numbers of adults and children in the household) of SA-eligible individuals into benefit levels for individuals in that household.¹⁰ Table 3 shows percentage declines in real SA benefit levels (applying province-specific CPI deflators) for individuals classified in the three most common household types. Benefit levels fell in nearly all provinces across most household types.¹¹ In general, provinces aggressively reduced SA benefit levels after 1994 although this trend has slowed or reversed since 2005. Some provinces, such as British Columbia, reduced benefits similarly

9 Based on data from the National Council of Welfare (2003, 2006, 2009), SA participation rates are computed annually as the fraction in each province of the non-elderly population (those strictly under the age of 65) receiving SA in March of a given year.

10 SA participants are individuals rather than households. A household can have multiple members participating in SA who are counted individually as SA participants. Formulas used by provinces to compute individual benefit levels depend, however, on the individual's household type.

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

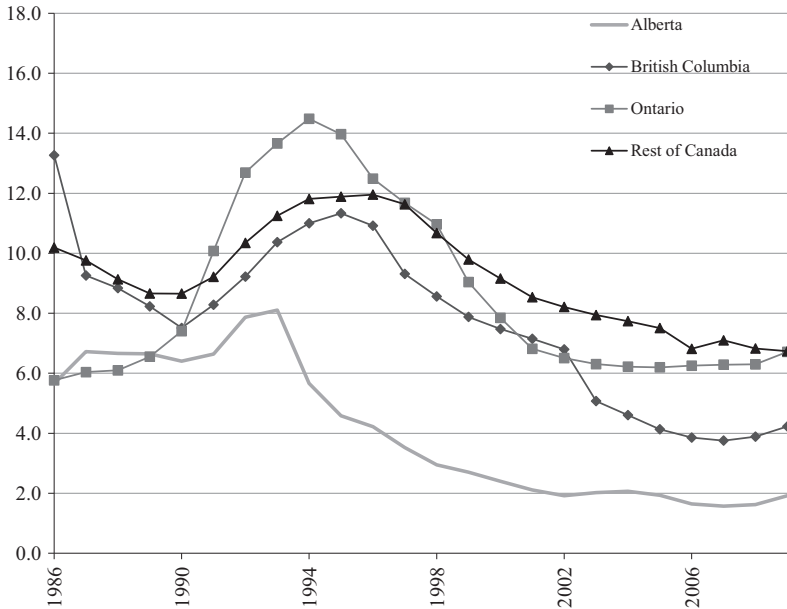


FIGURE 1 Time paths of social assistance participation rates in Canada

across different household types. Others, such as Manitoba, New Brunswick and Prince Edward Island, cut benefits more sharply for those in the Single, No Child category.¹² In a number of instances, however, real benefits rose (although sometimes coinciding with more stringent eligibility requirements). Newfoundland, for example, raised real benefits for Single, No Child individuals by a remarkable 59%.

Standard reform tool no. 2: Tightening eligibility requirements

Eligibility requirements include means tests, asset exemption limits, age restrictions on teenage participation and residency requirements.¹³ Unfortunately, there are insufficient data to individually code all these criteria used by provinces in each province-year. Although not ideal, our coding approach relies on the maximum liquid asset exemption level for each province-year. Applicants with liquid

12 Following the National Council of Welfare's interpretation of these terms, *single* refers to an adult living at an address with no other adults living at the same address. By this definition, the label *single* provides no definitive information about relationship or marital status. One presumes that single correlates with being unmarried and, perhaps more weakly, with having no partner to provide financial support and assist in raising children. Similarly, the designation *coupled* refers to an adult living at an address with precisely one other adult.

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

TABLE 2
Changes in SA participation rates* among non-elderly Canadians from 1994 to 2009,
by province

Province	1994** Participation rate	2009 Participation rate	Change in percentage points	Percentage change
Alberta	5.7	1.9	-3.7	-66.1
British Columbia	11.0	4.2	-6.8	-61.6
Manitoba	9.2	5.5	-3.7	-40.3
New Brunswick	11.2	6.1	-5.0	-45.1
Newfoundland	13.1	9.0	-4.1	-31.1
Nova Scotia	12.9	5.4	-7.5	-58.0
Ontario	14.5	6.7	-7.8	-53.7
Prince Edward Island	11.3	4.8	-6.5	-57.8
Quebec	12.4	7.3	-5.1	-41.0
Saskatchewan	9.4	4.7	-4.7	-49.8

NOTES: *Most spells on SA last less than a year. In British Columbia, for example, Barrett and Cragg (1998) found that most SA spells end within three months, and only 10% of spells last longer than a year (mostly single parents). By contrast, the authors note that roughly 40% of spells on welfare in the US last more than two years.
**Canada's national rate of SA participation peaked in 1994.

assets in excess of this dollar amount are not eligible for SA. Compared with benefit levels, there is far less year-over-year change in asset exemption levels within provinces, although changes tend to be rather large when they do occur.¹⁴

Labour market policy tools

In addition to benefit levels and eligibility requirements, government also controls minimum wage and Employment Insurance (EI), which are primary incentives affecting labour supply. Prior to 1990, an individual in Canada could work 10 weeks and qualify for 42 weeks of employment insurance benefits. The federal government reformed EI policy during the 1990s to discourage overuse. Following Arnau et al. (2005) and Finnie and Irvine (2008), we use three policy parameters—the minimum number of weeks of work required to gain eligibility for EI, the duration of EI benefits for someone who is minimally qualified for the program and the income replacement rate—to construct an EI index as a measure of the wage subsidy provided by the EI program.¹⁵ The impact of this wage subsidy on SA participation is theoretically ambiguous. To the degree that EI and SA are substitutes, theory predicts that larger EI wage subsidies would reduce SA participation. If they are complements, however, one expects that larger EI wage subsidies would induce entry into income support programs and therefore increase SA participation.

14 For example, British Columbia in 1992 raised asset exemption limits from C\$1,500 to C\$5,000 (in nominal terms) after leaving them unchanged for six years prior, but later reduced the exemption limit to C\$2,500 in 2002.

15 EI's policy parameters are set federally using formulas that depend on a province's unemployment rate.

TABLE 3
 Percentage changes in real SA benefits (province-specific CPI-deflator adjusted) from 1994 to 2009, by household type*

Province	Common household types		
	Single, no child	Single parent, one child	Coupled, two children
Alberta	10.1	9.1	-3.8
British Columbia	-14.5	-7.3	-11.2
Manitoba	-23.2	-2.0	-17.2
New Brunswick	-13.9	15.2	18.3
Newfoundland	58.8	11.3	12.8
Nova Scotia	-22.0	-8.3	3.9
Ontario	-34.3	-22.7	-23.5
Prince Edward Island	-30.0	-1.6	-4.4
Quebec	-11.6	0.6	5.2
Saskatchewan	10.4	11.0	3.0

NOTES: *The label *single* refers to an adult living at an address with no other adults and does not imply anything about marital or relationship status. It is possible for a person classified as single to be married, unmarried, with a romantic partner, or without, as long as those significant others do not reside at the same address. Similarly, *coupled* refers to households with two adults living at the same address. In 2008, about 61% of adult SA recipients (excluding those categorized as disabled) were in the category single adult, no child; 20% were single adults with at least one child; and about 10% were coupled with dependent children (Human Resources and Skills Development Canada, HRSDC, 2006). If one includes children, single adult families with at least one child account for 36% of all welfare participants. The three household types in this table cover most SA participants and are the most common classifications, although they are not exhaustive.

New reform strategies

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

Work requirements

Work requirements refer to policies that require SA participants to search for work, participate in job training programs, volunteer or hold a job in the private or public sector. Typically, SA participants are required to regularly document job search, training and work activities to continue receiving benefits. Depending on the province-year, failure to comply with these work requirements could result in sanctions (i.e., penalties, usually in the form of reduced SA payments). Provinces' policies differed in whether and how much SA participants would lose for failing to comply with work requirements. The coding scheme adopted here classifies

work requirements as weak if sanctions for non-compliance require forfeiting more than zero and less than 100% of the monthly benefit payment.¹⁶ Work requirements are considered strong if SA participants face losing 100% of the SA benefit as a sanction for non-compliance.¹⁷

In the labour supply model presented by Grogger and Karoly (2005, p. 49), work requirements are modelled in leisure-income space as a change in the budget set that forces welfare recipients to forfeit a fixed quantity of leisure to receive the SA benefit. According to this theory, it is assumed that the effective tax rate on labour market earnings while on SA is less than 100% so that the required reduction in leisure can be traded for some positive financial gain. The resulting prediction is that work requirements increase employment in one of two ways. The required reduction in leisure may induce an SA recipient to choose a new corner solution with positive labour supply while remaining in the SA program. Or, if the reduction in leisure is large enough, the theory predicts that work requirements lead to an increase in labour supply together with an exit from SA participation, either at a leisure-income pair on the interior of the budget set or at another corner solution where the required forfeit of leisure is tradable at market rates for an income level that exceeds the SA benefit.

In search-theoretic models of labour supply, two distinct costs of remaining on SA can be identified with depreciation of human capital based on the theory that some forms of human capital require it to be used to avoid higher rates of depreciation. If work requirements slow the depreciation of human capital (or perhaps even cause it to grow), then, all else equal, work requirements would increase the chance of finding work and raise the expected wage conditional on finding work. These effects increase the opportunity cost of remaining on SA.

Both static and dynamic search models imply that work requirements should lead to increases in employment and reductions in SA participation insofar as they raise the opportunity cost of remaining on SA. The extent to which work requirements reduce SA participation depends on how costly the unpaid work-related activities are in terms of forgone leisure and the severity of sanctions for non-compliance in terms of lost benefits (i.e., the marginal cost of leisure jumping higher as the threshold into non-compliance triggers sanctions).

Diversion

Diversion refers to policies that offer people trying to enter the SA program a negotiated lump-sum payment and/or guidance to seek other sources of support instead of directly entering the program and beginning to draw recurring benefits. Even if diversion incurs up-front costs for the SA program, it may save

16 Sanctions in province-years with weak work requirements typically amount to \$100 or less per month.

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

money over the long term by slowing entry and reducing rates of long-term SA participation. Diversion is classified as *weak* if the policy functions primarily as an information campaign that notifies would-be SA applicants of work opportunities, their eligibility for other government programs (e.g., unemployment insurance) and spousal or family support (especially alimony and child support payments). Diversion is classified as *strong* if case workers who screen SA applicants have discretion to do one of the following: offer immediate cash loans or one-time payments (e.g., to cover short-term job or search-related costs), institute waiting periods that automatically delay eligibility for would-be applicants or require would-be applicants to liquidate all assets, move in with relatives, visit food banks or satisfy other prerequisites before applications for recurring SA benefits are considered. Diversion is predicted to reduce SA participation based on the theory that temporarily avoiding entry into the program and increasing the hassle costs of completing entry will induce some to decide against entry. The diversion strategy typically requires applicants to complete lengthy questionnaires and provide additional documentation, raising the cost of applying. Dynamic models where the probability of employment decreases as a function of time spent in the program further predict that diversion shortens spells on SA and thereby reduces participation.

Earning exemptions

Historically, SA participants face very high effective marginal tax rates, because income from employment typically triggers loss of means-tested SA benefits (Anderson 1978; Wolfe 2002; Grogger and Karoly 2005). Earning exemptions function as tax cuts on the labour market earnings of SA recipients, aiming to encourage work by exempting some portion of labour market earnings from taxes. Coding focuses on two parameters that characterize a province's earnings exemption policy. First, there is a threshold up to which point earnings are not taxed at all, typically in the range of C\$100 to C\$300 per month. The second parameter is the marginal tax rate applied to labour market earnings above this threshold. Table 1 classifies province-years as having earnings exemptions if: (1) the threshold of allowable tax-free earnings is strictly greater than zero and (2) the marginal tax rate for earnings above this threshold is strictly less than 100%.¹⁸

Time limits

Time limits refer to policies that set a maximum duration for which SA benefits can be received. British Columbia is the only province to ever institute time limits. British Columbia's time limits allow SA participants to receive benefits for a maximum of two years out of every five-year period. Although less stringent than US time limits that set lifetime limits on the duration of welfare participation,¹⁹ theory predicts that time limits, if credible, raise the opportunity cost of partic-

¹⁸ Models reported below include these two earnings exemptions variables and an interaction term.

¹⁹ Large numbers of participants in both the US and British Columbia qualify for exemptions from time limits, which adds to the difficulty of quantifying the extent to which time limits in either country succeed in raising the opportunity cost of SA participation.

ipation by reducing the expected value of future streams of SA benefits. With an increase in the cost of remaining on SA, time limits are predicted to reduce participation by causing potential and current SA participants, on the margin, to ration their use of the SA system in order to maintain eligibility for future participation (Grogger and Karoly 2005, p. 49).

3. Data and models of social assistance participation

Data sources

Data from 1986 to 2009 on SA participation, benefit levels as well as earnings and asset exemptions were obtained from the National Council of Welfare (1987) and its Welfare Incomes series published most years from 1990 through 2009. The National Council of Welfare did not publish SA participation numbers for 1987 or 1988. The empirical results reported in this paper rely on interpolated participation numbers for those two years.

One potentially important limitation of the participation data is their aggregation of disabled and non-disabled recipients of SA. Disabled participants faced distinct labour market incentives in making labour supply decisions. Provinces' criteria for determining who is disabled shifted substantially. And, in many cases, SA policies directed at non-disabled participants did not affect disabled participants in the same ways. Therefore, it would be useful to have separate counts for disabled and non-disabled SA participants when measuring the effects of changes in SA policy. We searched for but were unable to locate usable data with counts or proportions of SA participants broken out by disabled status across all province-years. Disability status and benefit levels for the disabled changed heterogeneously across provinces. As part of SA reform, most provinces applied narrower criteria for determining disability status while maintaining benefit levels for those who still qualified (or cutting them by substantially less). At the same time, some provinces appeared to shift formerly non-disabled SA participants with longer SA spells into disability programs.²⁰

Another data limitation concerns the number of households (cases) receiving SA as opposed to individual beneficiaries. This study investigates the determinants of changes in SA participation as measured by the number of individual beneficiaries rather than households. To the extent that the number of SA participants in the typical SA household remains constant over time, the distinction between individual versus household participation is probably less unimportant. Some province-specific data suggest, however, (see online appendix H) that the composition of households receiving SA has changed, trending toward more childless singles and fewer single-parent families with children since 2000, which implies weaker correlations between changes in the numbers of individual beneficiaries and household cases.

20 For instance, since the adoption of Ontario Works in 1996, the number of disabled cases in Ontario rose even though the province's other caseloads were falling.

The lack of data on household types among SA participants means that we cannot easily match individual participants with the four household types in the National Council of Welfare's classification of benefit levels. Although one can find this information in a micro-panel sample (Survey of Labour Income Dynamics) housed at Statistics Canada, we were unable to find aggregate participation data broken out by household type. The result is that the controls for changes in benefit levels are not measured as precisely as would have been possible with aggregate participation data broken out by household type. The empirical models of participation therefore apply to aggregate province-year participation rates and include all SA participants (i.e., aggregating over individuals regardless of disability status and household type).

SA benefit levels are expressed in 2009 C\$ using province-specific CPI deflators. Benefit levels include basic assistance, provincial tax credits, provincial child benefits, the GST credit and the Federal Child Tax Benefit. Some provinces chose to "claw back" a portion of the Federal Child Tax Benefit by reducing basic benefit levels. We use the benefit levels for a single parent with one child to approximate the relative generosity of the SA program in each province.²¹ Province-specific population counts, demographic information, unemployment rates, real GDP growth and market income (median of the second income quintile) were collected from data files compiled by Statistics Canada.²² Employment insurance eligibility criteria were obtained from the *Employment Insurance Act* (S.C. 1996, c. 23), Beauchesne (1994) and Waddell (1989).²³

Summary statistics

Table 4 presents summary statistics for variables used in the empirical models. The number of observations is 240 province-years (10 provinces observed over 24 years).²⁴ The dependent variable is SA participation (PARTICIPATION), measured as the fraction of the non-elderly population (age 64 and under) in each

21 As the changes in benefit levels were non-uniform across household types as shown in table 3, any scalar-valued proxy is necessarily imperfect. According to Human Resources and Skills Development Canada (HRSDC 2006), 61% of all adult SA participants in 2005 (excluding the disabled) had Single, No Child household status, while another 21% were single with at least one child. Alternate runs of all models reported in this paper using a weighted average index of benefit levels did not overturn the reported findings on the effects of new reform strategies. Two points argue in favour of using Single, One Child as a proxy for benefits. First, the anomalous 45% increase in benefits for childless SA participants makes Newfoundland a troublingly influential outlier. The second point is that single parent households tend to have longer spells on SA (Barrett and Cragg 1998) and therefore substantially larger per-case costs accounting for a larger share of all SA transfer payments.

22 Statistics Canada data files used in our data sets are: Provincial Economic Accounts; Income Trends in Canada 1976 to 2009; CANSIM database tables 051-0012, 051-0020, 051-0012, 202-0701, 276-0001, 282-0086, 384-0009 and the Labour Force Survey (Statistics Canada 2007, 2009, 2010a, 2010b).

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

24 Online appendix A provides detail on source documents and coding rules used to create the new reform variables.

TABLE 4
Summary statistics (N = 240*)

Variables**	Min	Mean	Median	Max	Std. dev.
<i>Dependent variable</i> ***					
PARTICIPATION	1.57	8.14	7.91	14.67	2.79
<i>Standard reform tools</i>					
logBENEFITS_SINGLE_ONECHILD	9.50	9.68	9.67	10.03	0.10
logASSET.THRESH	6.91	8.03	8.05	9.68	0.51
<i>Labour market policy tools</i>					
logINCOME_2ndQUINTILE	10.03	10.2	10.18	10.59	0.11
EIINDEX	0.33	0.65	0.57	1.26	0.29
<i>Macroeconomic factors</i> ****					
UNEMPLOYMENT	2.40	8.74	8.30	18.90	3.73
REALGDPGROWTH	-10.12	2.40	2.39	15.60	2.71
<i>New reform strategies (finely coded)</i>					
WORKREQ_STRONG	0.00	0.22	0.00	1.00	0.41
WORKREQ_WEAK	0.00	0.25	0.00	1.00	0.43
DIVERSION_STRONG	0.00	0.16	0.00	1.00	0.37
DIVERSION_WEAK	0.00	0.12	0.00	1.00	0.33
TIMELIMITS	0.00	0.03	0.00	1.00	0.18
logEARNINGS.THRESH	0.00	4.27	5.05	6.10	2.04
EARNINGS_TAX	50.00	81.81	80.00	100.00	15.93
<i>New reform strategies (coarsely coded)</i>					
NEWREFORM	0.00	0.28	0.00	1.00	0.45
<i>Demographics</i>					
SINGLEPARENTS	4.46	7.48	7.53	10.13	0.91
MIGRATION	-2.20	-0.15	0.14	1.69	0.58
DROPOUT	6.10	12.90	12.45	23.04	3.70
NONPERM_RESIDENTS	0.08	0.84	0.64	3.28	0.58

NOTES: *240 observations are derived from 10 provinces observed at 24 points in time.

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

***PARTICIPATION is the fraction of a province's population age 64 and under receiving SA benefits in a particular year. Thus, PARTICIPATION is a rate and its units are percentage points, with a theoretical range of 0 to 100, and an empirical range of 1.57 (in Alberta) to 14.67 (in Newfoundland).

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

province-year counted as SA participants.²⁵ The empirical range of PARTICIPATION extends from the maximum of 14.67% (Newfoundland in 1997) to the minimum of 1.57% (Alberta in 2007).

With each new reform variable coded as a distinct dimension within a vector-valued description of a multi-dimensional SA policy environment, the *finely coded* representation of new reform strategies consists of the following five vari-

25 We also experimented with natural log and arc-tan transformations of the dependent variable, mapping the unit interval to theoretically unbounded subsets of the real number line. These transformations led to greater asymmetry (i.e., skewness or non-normality) in the corresponding empirical distributions and increased the influence of observations in the tails of the distribution.

ables: `WORKREQ_STRONG`, `WORKREQ_WEAK`, `DIVERSION_STRONG`, `DIVERSION_WEAK` and `TIMELIMITS` (indicator variables based on table 1), plus earnings exemption variables and their interaction, `logEARNINGS_THRESH`, `EARNINGS_TAX` and `THRESH_TAX_INTERACT`.²⁶ New reform strategies coded as indicator variables that were adopted mid-year are represented by a fraction based on the number of months (out of 12) that those policies were in effect.²⁷ A second set of empirical models is specified with a coarsely coded variable, `NEWREFORM`, which takes on the value of 1 in any year in which three or more of the new reform strategies were in effect.

According to table 4, the mean of 0.22 for `WORKREQ_STRONG` indicates that 22% of the 240 province-years in the sample have strong work requirements in effect. Table 4 also shows that *weak* work requirements were more common in Canada, having been active in 25% of province-years. The mean value of `EARNINGS_TAX` of 82% in table 4 shows the high marginal tax rates faced by SA participants on earnings above the exemption threshold.

The question arises as to whether there is sufficient variation among province-years for the eight finely coded new reforms to be identified. Correlations between these eight variables are generally small. One exception, however, is `WORKREQ_STRONG` and `DIVERSION_STRONG`, which have pairwise correlation of 0.82 based on 13 years in which Alberta, British Columbia and Ontario had both in effect. `WORKREQ_STRONG` is present in 54 province-years (including three partial-year values), of which 17 also have zero or partial-year values for `DIVERSION_STRONG`, which identifies the difference. Despite substantial variation across province-years (in finely coded new reforms) visible in table 1, concerns about weak statistical identification motivate coding of the scalar-valued variable `NEWREFORM`. According to table 2, its mean of 0.28 indicates that 28% of province-years have three or more new reform strategies (weak or strong) in effect.

The unemployment rate for each province-year among prime-age males (ages 25–54), `UNEMPLOYMENT`, serves as a proxy for inverse tightness of labour market conditions. Using this subpopulation's unemployment rate is likely to be better calibrated to labour market conditions that SA participants face and reduces co-linearity with the EI index, which uses each province-year's unemployment rate among all individuals in the labour force. The province-specific GDP growth rate, `REALGDPGROWTH`, is included as a further control for changes in province-specific labour demand. The empirical models include contemporaneous and lagged values (not listed separately in table 4) of `UNEMPLOYMENT` and `REALGDPGROWTH`.

The variable measuring benefit levels, `logBENEFITS_SINGLE_ONECHILD`, ranges from 9.50 to 10.03, covering slightly more than 50 log-approximated percentage points, as shown in table 4. Eligibility requirements are measured as

26 Real maximum earnings thresholds (`logEARNINGS_THRESH`) were transformed by adding one dollar before taking natural logs.

27 Different coding schemes to account for the fraction of the year in which new reform policies were in effect during the first year they were implemented produced no substantial differences in estimated regression coefficients.

logASSET_THRESH (with higher asset thresholds indicating more lenient rules for SA participation), which has a very large empirical range of variation of 2.77 (=9.68 – 6.91) revealing substantial policy change in eligibility requirements both within and between provinces.

Controls for alternative income sources (earned income or benefits from programs *other* than SA) include the natural log of median income among those in the second income quintile (logINCOME_2NDQUINTILE) and logEI_INDEX. Where applicable, all variables expressed in Canadian dollars are converted from nominal to real using province-specific CPI deflators and expressed in units of 2009 \$. Since the market wage for low-skilled workers can be greater than the minimum wage, income levels in the 2nd income quintile provide useful information that control for alternate sources of income among potential SA participants.²⁸ The relative generosity of the EI program, which provides transfer payments to non-elderly out-of-work Canadians, was approximated by using the natural log of (one plus) the EI index as specified in Arnau et al. (2005) and Finnie and Irvine (2008). Finally, the empirical models include four controls for demographic differences across provinces and time. The proportion of single parents in the 64-and-under population is measured by SINGLEPARENTS (on a 0–100 scale), which provides a control for differences in demand for SA. The inter-province rate of migration (i.e., the net number of people moving into a province as a fraction of the destination province's non-elderly population) is measured by the variable MIGRATION. Differences in the lower tail of the distribution of education outcomes are measured by DROPOUT, which records each province-year's high school dropout rate. This variable controls for another mechanism that influences demand for SA, based on theory and observation that imply that provinces with higher stocks of formal education and more skilled workers are likely to have lower demand for income support programs (Coelli et al. 2007). Non-permanent residents as a share of the non-elderly population in each province-year is measured by NONPERM.RESIDENTS, which controls for differences in the numbers of people claiming refugee status; people holding a study, work or Minister's permit; and/or non-Canadian-born dependants of non-permanent residents.

Empirical models

Model A includes standard reform tools and labour market policy tools without other controls. Model B adds macroeconomic factors with one- and two-year lags. Model C adds the main explanatory variables of interest: new reform variables. Model D adds the four demographic controls.²⁹ Model E repeats D but with coarsely coded NEWREFORM in place of the eight finely coded new re-

28 Alternative runs using the median of the first (lowest) quintile or, alternatively, minimum wage closely tracked results reported in section 4.

29 Gelbach (2010) cautions that the order in which covariates are added can influence reported results to an extent that is often underappreciated. Following Gelbach's recommendations, we begin with an empirical model that includes only the policy variables that are already well-established as influences on SA participation.

form variables. Models that include province fixed effects are labelled “+PFE” and those that include year fixed effects are labelled “+YFE.” Specifications with finely coded (i.e., eight-dimensional) and coarsely coded (scalar-valued) representations of new reforms are presented side by side for comparison.

Model A includes only SA benefit levels, eligibility requirements, income and unemployment benefit levels (i.e., the most commonly studied drivers of welfare participation, stacked into the 4x1 vector SRT_{it}):

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

where Y_{it} represents SA participation rates in province i (ranging from 1 to 10) in year t (ranging from 1986 to 2009) and α is a constant, SRT'_{it} represents the transpose of SRT_{it} , μ is a 4x1 vector of coefficients measuring the expected change in SA participation associated with a one-unit change in each policy variable stacked in SRT_{it} and ε_{it} represents unobserved heterogeneity uncorrelated with other right-hand-side variables and assumed to have zero mean with a block-diagonal variance matrix allowing for within-province correlation (while assuming between-province independence).

To simplify notation and see the encompassing relationship among models A through D, an abuse of notation that re-uses Greek symbols that should be denoted with model-specific indexing is used to express the encompassing models below. Model B adds six macroeconomic controls, the 6x1 vector M_{it} , which includes UNEMPLOYMENT and REALGDPGROWTH contemporaneously and with two lags each:

$$Y_{it} = \alpha + SRT'_{it}\mu + M'_{it}\rho + \varepsilon_{it}, \quad (2)$$

where ρ is a 6x1 vector of coefficients that represent the marginal effects of the macroeconomic variables on SA participation. All other symbols are defined as before (with the caveat that each re-used symbol is quantitatively distinct from other models' instances of the same symbol).

Model C includes the eight new reform variables *finely coded*, intended to capture multiple dimensions of cross-province and temporal variation in new reform strategies:

$$Y_{it} = \alpha + SRT'_{it}\mu + M'_{it}\rho + NRS'_{it}\pi + \varepsilon_{it}, \quad (3)$$

where NRS_{it} represents an 8x1 vector of new reform variables and π is an 8x1 vector of coefficients.

Next, model D includes the four demographic variables (stacked in the 4x1 vector D_{it}):

$$Y_{it} = \alpha + SRT'_{it}\mu + M'_{it}\rho + NRS'_{it}\pi + D'_{it}\kappa + \varepsilon_{it}, \quad (4)$$

where κ is a 4x1 vector of coefficients measuring effects on SA participation of one-unit changes in each demographic variable.

Province fixed effects (PFE) are the 9x1 vector of coefficients λ multiplying province indicators stacked in the 9x1 vector L_i (for location i) consisting of

time-invariant dummies for all provinces other than Alberta (which serves as the omitted reference class).³⁰ Year fixed effects (YFE) are the 23x1 vector of coefficients τ multiplying year indicators stacked in the 23x1 vector T_t (for time), which consist of dummies for all years other than 1986 (the first year in the sample, which serves as the omitted reference class). The fully encompassing model, with all regressors, province and year fixed effects, is referred to as finely coded model D+PFE+YFE:

$$Y_{it} = \alpha + \text{SRT}'_{it}\mu + M'_{it}\rho + \text{NRS}'_{it}\pi + D'_{it}\kappa + L'_i\lambda + T'_t\tau + \varepsilon_{it}. \quad (5)$$

To facilitate comparison with Kneebone and White (2009) and studies using US data with scalar-valued measures of new reforms, we collapse the eight-dimensional representation of new reforms into the scalar-valued variable NEWREFORM, the model labelled E+PFE+YFE:

$$Y_{it} = \alpha + \text{SRT}'_{it}\mu + M'_{it}\rho + \text{NEWREFORM}'_{it}\pi + D'_{it}\kappa + L'_i\lambda + T'_t\tau + \varepsilon_{it}, \quad (6)$$

where NEWREFORM_{it} takes on the value 1 in province-years with three or more new reform strategies in effect, and 0 otherwise. Five provinces meet this threshold for belonging to the treatment group indicated by NEWREFORM: Alberta (March 1993–), British Columbia (January 2002–), Ontario (September 1996–), Prince Edward Island (June 1995–) and Saskatchewan (May 2001–). Province-years not indicated comprise the control group.³¹ Standard errors are computed using Arellano's (1987) clustered covariance matrix (CCM) technique, which assumes that ε_{it} is uncorrelated between provinces but autocorrelated within province.³²

30 Province fixed effects provide a coarse set of controls for difficult-to-measure differences in provinces' other policies, cultures and fundamentals such as physical capital per worker (perhaps absorbing too much variation but tending to shrink other estimated effects).

31 Some accounts raise questions about the stringency of Prince Edward Island's new reforms. Its inclusion in this list of relatively aggressive reformers follows from the algorithmic coding schemes and source materials described above. We acknowledge the possibility that PEI's new reforms were less aggressive than in the other four provinces.

32 Bertrand et al. (2004) caution that, without proper control for autocorrelation, standard measures of statistical significance are misleading. The CCM standard errors are noticeably larger, shrinking reported t statistics and making it more difficult for the data to pass the threshold of statistical significance. Under classical assumptions for a panel model based on N units (provinces) observed for T periods and with K regressors, the degrees of freedom for t statistics is $NT - K - 1$. Arellano's (1987) method is appropriate when $N > T$. For the case relevant to the data in this paper where $T > N$, however, Hansen (2007) proposes a more conservative formula for degrees of freedom, $N - 1$, when using CCM to control for autocorrelation. How one interprets the t statistics in table 5 and 6 (presented in section 4) depends on whether Hansen's or Arellano's distribution is assumed. Under classical assumptions with $240 - (9 + 23 + 22 + 1) - 1 = 184$ degrees of freedom (based on nine province fixed effects, 23 year fixed effects, 22 other regressors and a constant in Model D+PFE+YFE), the well-known critical values 1.65 and 1.98 cut off two-sided confidence regions (90 and 95%, respectively). Under Hansen's more conservative approach with $10 - 1 = 9$ degrees of freedom, the critical t values are 1.83 and 2.26 (for 90 and 95% confidence levels, respectively).

TABLE 5
SA participation rate regressions with province and year fixed effects

Estimated coefficients and absolute t values for models:										
Variables	A+PFE+	t	B+PFE+	t	C+PFE+	t	D+PFE+	t	E+PFE+	t
	YFE		YFE		YFE		YFE		YFE	
<i>Standard reform tools</i>										
logBENEFITS_SINGLE.ONECHILD	6.32	2.7	5.80	2.6	0.89	0.3	0.83	0.3	2.95	1.4
logASSET_THRESH	-0.07	0.2	0.03	0.1	-0.05	0.3	0.00	0.0	0.24	1.1
<i>Labour market policy tools</i>										
logINCOME_2ndQUINTILE	-2.19	1.0	0.55	0.4	-0.66	0.4	-0.27	0.1	1.77	1.3
logELINDEX	8.61	8.1	7.37	4.3	8.24	4.8	8.65	5.5	8.16	4.9
<i>Macroeconomic factors</i>										
UNEMPLOYMENT			-0.09	0.8	-0.08	0.7	-0.15	1.8	-0.13	1.0
UNEMPLOYMENT _{t-1}			0.09	1.2	0.11	1.3	0.12	1.3	0.11	1.2
UNEMPLOYMENT _{t-2}			0.23	2.8	0.11	1.0	0.11	1.0	0.19	1.8
REALGDPGROWTH			0.00	0.1	0.00	0.0	0.02	0.6	0.01	0.2
REALGDPGROWTH _{t-1}			-0.03	1.7	-0.03	1.6	-0.03	1.3	-0.04	2.1
REALGDPGROWTH _{t-2}			-0.04	1.6	-0.04	1.9	-0.04	1.5	-0.05	1.7
<i>New reform strategies (finely coded)</i>										
WORKREQ_STRONG			-1.12	2.0	-1.12	2.0	-1.43	3.2		
WORKREQ_WEAK			-1.07	2.8	-1.07	2.8	-1.10	3.0		
DIVERSION_STRONG			-1.34	1.4	-1.34	1.4	-0.83	1.0		
DIVERSION_WEAK			0.21	0.5	0.21	0.5	0.10	0.3		
TIMELIMITS			0.24	0.2	0.24	0.2	-0.55	0.6		
logEARNINGS_THRESH			0.33	0.9	0.33	0.9	0.30	0.8		
EARNINGS_TAX			0.01	0.3	0.01	0.3	0.01	0.3		
THRESH_TAX_INTERACT			0.00	0.7	0.00	0.7	0.00	0.7		
<i>New reform strategies (coarsely coded)</i>										
NEWREFORM									-1.08	2.8

TABLE 5
Continued

Estimated coefficients and absolute t values for models:										
Variables	A+PFE+ YFE	t	B+PFE+ YFE	t	C+PFE+ YFE	t	D+PFE+ YFE	t	E+PFE+ YFE	t
<i>Demographics</i>										
SINGLEPARENTS							0.13	1.5	0.19	1.7
MIGRATION							-0.26	1.5	-0.19	0.7
DROPOUT							-0.05	1.3	-0.08	2.6
NONPERM_RESIDENTS							0.33	1.2	0.08	0.2
Constant	-41.96	1.3	-66.24	2.0	-5.45	0.2	-9.21	0.3	-52.37	1.7
Province fixed effects	Yes		Yes		Yes		Yes		Yes	
Year fixed effects	Yes		Yes		Yes		Yes		Yes	
R-squared	0.921		0.930		0.951		0.954		0.940	

4. Results

Table 5 presents estimates of models A+PFE+YFE through E+PFE+YFE (i.e., models A through E with province and year fixed effects). Estimates across each of these models suggest that the wage subsidy ($\log EI_INDEX$) offered by the EI program is positively associated with SA participation regardless of model specification. The results imply that EI and SA are complements in the sense that rates of SA participation are higher in province-years that provide greater access to income support through EI. This finding confirms previously reported findings in studies of Canadian SA participation (Finnie and Irvine 2008). The effect size of 8.16 implies that a one standard deviation change in log of the EI index of 0.10 (an approximate 10% increase in the EI index) translates into the expected participation rate increasing by 0.816 percentage points.

The variable measuring SA benefit levels ($\log BENEFITS_SINGLE_ONECHILD$) has large effects on SA participation although its significance (both economic and statistical) becomes weaker once new reform strategies are included in the model. The coefficients on $\log BENEFITS_SINGLE_ONECHILD$ in model A+PFE+

YFE indicate a 0.30 to 0.60 percentage-point increase in SA participation associated with a 10% increase in benefit levels. Although the literature on benefit levels is mixed, the benefits effects in table 5 are consistent with micro-data findings (Allen 1993) that frequency of child birth, divorce and SA participation are positively associated with benefit levels. Another important point of comparison in the benefits literature for interpreting coefficients in table 5 is Milligan and Stabile (2007), who find that reductions SA benefits—which occurred in Alberta, Manitoba, Nova Scotia, Ontario and Prince Edward Island—could account for 19% to 27% of the decline in SA participation in those provinces.

In general, table 5 suggests that labour market tightness, as measured by the unemployment rate of prime-age males ($UNEMPLOYMENT$) and macroeconomic fluctuations ($REALGDPGROWTH$), has surprisingly small effects on SA participation. Though jointly insignificant (and failing to reject that the sum is zero), the $UNEMPLOYMENT$ coefficients pick up a noticeable effect in the second-year lag, implying that a large four to five percentage-point difference in unemployment rates could be associated with a one percentage-point difference in the SA participation rate two years later. Similarly, the sum of coefficients for $REALGDPGROWTH$ and its two lags is statistically indistinguishable from zero in most models.

Models C+PFE+YFE and D+PFE+YFE show that work requirements are the only finely coded new reforms with large and statistically significant effects reducing SA participation. Estimates from model D+PFE+YFE for $WORKREQ_STRONG$ suggest that the presence of work requirements with strong sanctions were associated with a reduction in SA participation of 1.43 percentage points ($t = 3.2$). Relative to the unconditional mean participation rate of 8.14%, expected participation in province-years with strong work requirements

is 17.6% less ($-1.43/8.14 = -0.176$). Work requirements with weak sanctions (WORKREQ_WEAK) also have statistically significant effects on SA participation (even when applying Hansen's more conservative N-1 degrees of freedom).

The finding that work requirements are associated with reduced SA participation is in line with the predicted effects of work requirements in Grogger and Karoly's (2005) static labour supply model and matches the empirical findings from US data surveyed in that same volume. Rector and Youssef (1999) and Danielson and Klerman (2008) report that strong versus weak sanctions (for non-compliance with work requirements) reduce welfare participation in the US by 16 to 39%.³³ Table 5 shows relatively small differences in effect size between strong versus weak enforcement of provinces' work requirements. Effects of diversion in table 5 are not estimated precisely enough to be statistically distinguishable from zero, although the information coded in the diversion variables produces more pronounced effects in the distributed lag and dynamic models presented in the next subsection.³⁴ Few studies have sought to measure the degree to which diversion affects SA participation, in part, because differences in diversion strategies across jurisdictions are often too subtle for obvious coding and inclusion in econometric models. Finnie et al. (2005) provide evidence, however, suggesting that diversion may have played an important role in reducing entry rates into SA in Canada. Green and Warburton (2004) examine the impact of tightened eligibility requirements in British Columbia between 1995 and 1996, suggesting that added caseworker scrutiny (one interesting dimension of diversion) led to no long-term reduction in participation.

In model D+PFE+YFE, time limits are associated with negative, but statistically insignificant, effects on SA participation, which is unsurprising given that they were present in only eight of 240 province-years (British Columbia 2002–2009). It is also possible that some SA participants anticipated the implementation of British Columbia's time limits and exited SA prior to its implementation so as to ration eligibility. To investigate this a bit further, we ran a model re-coding TIMELIMITS according to when British Columbia first made public its intentions to limit SA use (late in 2001), which did not change the qualitative findings. Another explanation for the weak effect of the time limits variable is the subsequent number of exemptions from time limits, which meant that few participants faced binding effects because of the way in which this policy was implemented.³⁵

Model E+PFE+YFE reports estimates using coarsely coded (scalar-valued) NEWREFORM as the only new reform variable. The coefficient of NEWRE-

33 For contrasting results, see Hofferth et al. (2002), who find that sanctions had no impact on SA exit rates. A similar conclusion follows from MaCurdy et al. (2002), who conclude that work requirements and sanctions led to no significant reductions in US welfare participation.

34 Diversion has large-magnitude, negative coefficients when province fixed effects are excluded. Similarly indicative of other regressors absorbing correlated variation in diversion are the bivariate benchmark estimates in online appendix B, which show large negative associations between strong diversion and participation.

35 There is strong evidence that lifetime time limits reduced welfare participation in the US (Swann 2005; Grogger 2004; Grogger et al. 2003), despite substantial numbers of exemptions granted by some states.

FORM of 1.08 indicates that province-years with any three new reform strategies have expected participation rates 1.08 percentage points lower than in province-years without. Relative to the unconditional mean of 8.14, this translates to 13% less SA participation.³⁶ Although the estimated effects of changes in benefit levels have large standard errors, a calculation of the benefit reduction required to generate reductions in participation equivalent to NEWREFORM (dividing the coefficient on NEWREFORM in model E+PFE+YFE by the coefficient on logBENEFITS_SINGLE_ONECHILD) is 37%.

Dynamic models

Table 6 presents participation models with one-year distributed lags of new reform variables, fully differenced models and dynamic models with lagged participation on the right-hand side estimated with the Arellano-Bond estimator.³⁷ Table 6 shows cumulative effects of strong work requirements ranging from -0.74 ($p=0.0000$) to -1.99 ($p=0.0017$) percentage-point changes in expected participation. In all three finely coded specifications, the effect sizes of strong work requirements are stronger at the one-year lag than contemporaneously. Table 6 reveals slightly stronger evidence that diversion is negatively associated with participation. And table 6 shows suggestive evidence that time limits were implemented in a way that took at least a year to exert downward pressure on participation, although these cumulative effects are mostly indistinguishable from zero with the smallest p-value (associated with the null that the sum of contemporaneous and lagged coefficients is zero) of 0.0862. In the final three columns of table 6 (models with coarsely coded NEWREFORM and its lag), cumulative effects range from -0.58 ($p=0.0000$) to -1.54 ($p=0.0331$) percentage points associated with the presence of new reforms in a given province-year.³⁸

A distinct question regarding the dynamics of SA policy and participation concerns the possibility of endogeneity, where high levels of participation could

36 Restricting the treatment group to the provinces of Alberta (1993–2009), British Columbia (2002–2009) and Ontario (1996–2009), which likely provides a more accurate comparison with US reform initiatives, produces an effect size for NEWREFORM of -1.65 ($|t|=2.9$), 50% larger than the estimate shown in table 5. This more restrictive treatment group more closely approximates Kneebone and White's (2009) Administrative Procedures variable and the effect size they report.

37 Online appendix D reports the same six models as in table 6 with five-year distributed lags to investigate the sensitivity of the results in table 5 and 6 (namely, that new reforms significantly reduce participation) to longer lag lengths, reflecting the possibility that these policies influenced participation with a cumulative response that extended longer than two years. Models with five lags confirm the large and statistically significant effects of strong work requirements at the one-year lag, but with no statistically significant effects from longer lags. Cumulative effects of weak work requirements are smaller in table 6 than in table 5 (with only contemporaneous effects) when comparing fully differenced and Arellano-Bond specifications.

38 Checking robustness of our findings to alternate versions of the empirical models using pre-filtering and time-differencing reflects our attempt to address concerns that statistical associations between new reforms and participation could have been merely spurious artefacts from non-stationary data. Online appendices AR and HP reproduce the qualitative findings, however, using SA participation data based on: (i) residuals from province-specific AR(1) models and (ii) de-trended residuals from the Hodrick and Prescott (1997) filter.

TABLE 6
One-year distributed lag, fully differenced and dynamic SA participation rate models

Variables	Finely coded new reforms (D+PFE+YFE and augmented dynamic specifications)				Coarsely coded new reforms (E+PFE+YFE with augmented dynamic specifications)			
	Distributed lag	t	Fully differenced	z	Distributed lag E+PFE+YFE	t	Fully differenced	z
PARTICIPATION _{t-1}				15.18				22.5
<i>Standard reform tools</i>								
logBENEFITS.SINGLE.ONECHILD	-0.99	0.4	2.26	0.38	2.47	1.2	3.21	1.9
logASSET.THRESH	0.10	1.0	0.05	0.07	0.31	1.2	0.11	0.9
<i>Labour market policy tools</i>								
logINCOME_2ndQUINTILE	1.86	0.8	0.23	-0.19	1.99	1.2	0.05	0.1
logELINDEX	8.36	5.7	1.39	3.48	8.30	5.3	1.40	2.5
<i>Macroeconomic factors</i>								
UNEMPLOYMENT	-0.10	1.1	0.02	-0.04	-0.11	0.8	0.02	0.7
UNEMPLOYMENT _{t-1}	0.08	0.9	0.11	0.01	0.06	0.7	0.10	2.2
UNEMPLOYMENT _{t-2}	0.21	1.9	0.11	0.04	0.26	2.2	0.10	2.3
REALGDPGROWTH	-0.02	0.7	-0.01	-0.02	-0.02	0.9	-0.01	1.1
REALGDPGROWTH _{t-1}	-0.01	0.5	-0.02	-0.03	-0.02	1.3	-0.02	1.3
REALGDPGROWTH _{t-2}	-0.04	1.8	-0.02	-0.03	-0.05	2.1	-0.02	1.0
<i>New reform strategies (finely coded)</i>								
WORKREQ.STRONG	-0.40	0.6	0.07	-0.26				
WORKREQ.STRONG _{t-1}	-1.59	2.9	-0.84	0.30				
Cum. effect: WORKREQ.STRONG	-1.99	(p=0.0017)	-0.77	(p=0.1094)				
WORKREQ.WEAK	-0.93	2.1	-0.37	-0.42				
WORKREQ.WEAK _{t-1}	-0.09	0.3	-0.11	0.27				
Cum. effect: WORKREQ.WEAK	-1.02	(p=0.0060)	-0.49	(p=0.0552)				
DIVERSION.STRONG	-0.14	0.2	-1.17	-0.83				
DIVERSION.STRONG _{t-1}	-1.14	1.3	-1.11	1.4				
Cum. effect: DIVERSION.STRONG	-1.28	(p=0.1380)	-2.27	(p=0.0135)				
DIVERSION.WEAK	0.45	1.0	-0.07	-0.01				
DIVERSION.WEAK _{t-1}	-0.69	1.5	-0.44	1.8				
Cum. effect: DIVERSION.WEAK	-0.24	(p=0.3055)	-0.51	(p=0.1074)				

have caused political support for implementing new reforms. Reverse regression of NEWREFORM (as the dependent variable) on lags of participation produce no statistically significant and positive coefficients. In contrast, models of participation with lags of policy (and the full set of controls on the right-hand side in both cases) support the hypothesis that these policy changes have economically and statistically significant negative associations with observed reductions in participation. There is no evidence of reverse causation in the fully differenced, Arellano-Bond or reverse regressions. These models also help address the question of whether reversion to the mean could have generated spurious negative associations between new reforms and subsequent reductions in participation. For example, if unusually high participation rates had caused political support to shift in favour of implementing new reforms, then subsequent reversions of participation to its expected levels could have produced spurious negative associations that do not reflect true negative correlation in the data-generating process. The data reveal no evidence consistent with these hypotheses of spurious correlation. These models also help address the question of whether reversion to the mean could have generated spurious negative associations between new reforms and subsequent reductions in participation.

New reform strategies' contribution to observed declines in SA participation

Table 7 compares the contributions of four prominent factors thought to have influenced the large observed declines in Canada's SA participation rate from its peak in 1994 through 2009: new reform strategies, declines in long-run unemployment rates, lower benefit levels and lower EI wage subsidies.³⁹

One basic question is whether the decline in participation was due to SA reforms, the good luck of positive macroeconomic shocks or something else as yet unexplained. Table 7 shows that provinces implementing new reforms (measured by the policy variable NEWREFORM) explain about 10% of the decline in SA participation during this period. Declines in the long-run unemployment rate (among prime-age males) that occurred between 1994 and 2009 explain only about 6%. Reductions in SA benefits (although not statistically significant) ex-

39 Factors not included in table 7 (e.g., stricter eligibility requirements and improvements in real income) were not statistically significant. Other omitted factors may have been statistically but not economically significant. Table 7 is after a table in Council of Economic Advisors (CEA, 1999) summarizing the role of US policies in explaining post-1996 declines in US welfare participation. Column (1) shows estimated coefficients from Model D+PFE+YFE in table 6. Column (2) shows the observed change in the province-specific population-weighted national average of each right-hand-side factor (computed as the 2009 observation minus the 1994 observation of x). Column (3) shows the expected change in the SA participation rate since 1994 based on the observed change in each right-hand-side factor (holding all else equal), computed as the product (or sum of products) of the coefficient(s) in column (1) and change(s) in x in column (2). Column (4) translates expected declines in participation (reported as changes in units of percentage points in column (3)) into headcounts measuring the expected number of Canadians prevented from receiving SA (per year) attributable to changes in x on the right-hand side, one factor at a time. Finally, column (5) reports percentages of the observed decline attributable to each factors, computed as column (3) divided by the observed percentage point decline in Canada's SA participation rate of -6.3 ($= 6.1\%$ in 2009 minus 12.5% in 1994).

TABLE 7
Per-factor contribution* to observed declines in SA participation, 1994–2009

	(1) Estimated coefficient ($\hat{\beta}$) from model E+PFE+YFE	(2) Change in each factor (Δx) from 1994 to 2009	(3) Expected change in the SA participation rate ($\hat{\beta}\Delta x$) from 1994 to 2009, per factor	(4) Expected number of Canadians prevented from collecting SA per year, per factor	(5) Percentage contribution to explaining the observed decline in SA participation, 1994 to 2009
Factor (x)**					
New reform strategies	-1.08	0.573	-0.62	-178,452	9.8
Decline in long-run unemployment	0.16	-2.166	-0.36	-102,950	5.7
Lower SA benefit levels	2.95	-0.092	-0.27	-78,476	4.3
Lower EI wage subsidy	8.16	-0.133	-1.09	-314,981	17.4
Other					62.8

NOTES: *The relative contribution in the last column of this table is the expected decline in SA participation (from its peak in 1994 through 2009, given in the third column) divided by the observed (unconditional) decline in SA participation during that same period, which was -6.3 percentage points. Column (1) repeats (or, in the case of long-run unemployment, computes a simple sum of) coefficients from model E+PFE+YFE in table 5 that coarsely bundles new reform strategies into a single policy variable. These coefficients are interpreted as the expected change in the annual rate of SA participation (in units of percentage points on a 0 to 100 scale) conditional on a one-unit change in the right-hand-side factor. Column (2) computes the 2009-province-population-weighted change in each right-hand-side factor (e.g., the 2009 province-weighted unemployment rate minus the 1994 province-weighted unemployment rate = -2.166). The change in new reform strategies of 0.573 is the fraction of Canadians in 2009 living in a province with new reform strategies in place (provinces in which NEWREFORM = 1) minus the fraction of Canadians in 1994 living in a province with new reform strategies in place.

Column (3) is the product of columns (1) and (2). Column (3) computes the mean Canadian province's expected decline in its annual rate of SA participation attributable to changes in the right-hand-side factor from 1994 through 2009. In column (4), the expected number of Canadians per year prevented from going onto SA that is associated with observed changes in each x-factor is computed as the expected decline in SA participation from column (3) translated to headcounts using population data from 2005 (age 64 and under).

Column (5), the per-factor contribution to explaining the observed (unconditional) decline of -6.3 percentage points is computed as the expected decline in column (3) divided by -6.3. A negative contribution implies that the factor changed in a direction which, all else equal, would have increased SA participation. **Coefficients for UNEMPLOYMENT, including their lagged counterparts, and logBENEFITS_SINGLED_ONCHILD are on average not significant at either the 90% or 95% confidence level. Contribution of tightened eligibility requirements (proxied by logASSET_THRESH) and GDP growth are omitted due to estimates not having either economic or statistical significance. Likewise, contribution demographic changes have been omitted for simplicity.

plain around 4% (less than half the effect of adopting new reform strategies). By far, the biggest driver of declines in SA participation is changes in EI policy. Reducing the EI wage subsidy explains 17% of the decline in SA participation. Table 7 implies that new reforms were at least half as effective in reducing SA participation as cuts in EI and roughly twice as effective as reductions in SA benefits and tightening eligibility requirements.

Kneebone and White (2009) report that administrative procedures (i.e., new reform strategies) in Alberta, British Columbia and Ontario explain 47% to 65% of the reduction in SA participation in those provinces between 1992 and 2003. They also find that changes in the unemployment rate explain only 11% to 21% of the declines. Their econometric model contains fewer control variables, which matches what emerges from our model with fewer controls or truncation of the sample period to exclude the last half of the 2000s (i.e., larger effects of new reforms associated with reduced participation). Like the findings presented here, US studies generally find that new reforms played a larger role than did reductions in unemployment rates. For instance, the Council of Economic Advisors (CEA, 1999) finds that policies under the PRWORA that were comparable to new reform strategies accounted for about 36% of the decline in SA participation between 1996 and 1998 while improvements in the unemployment rate accounted for only 8%.⁴⁰

New reform strategies and employment, employment rates and the labour force

If new reforms succeeded at reducing SA participation, then one wants to know what happened to those Canadians who were likely prevented from receiving SA. Table 8 presents evidence (aggregated once again at the level of province-years) of new reforms affecting employment, employment rates and the labour force. The results are mixed. New reforms were associated with an increase in employment of around 6% in the coarsely coded $\log(\text{EMPLOYMENT})$ model but negatively associated with employment rates, apparently because the labour force increased by more than the number employed. Although an economically and statistically significant number of former participants appears to have found work in province-years with NEWREFORM in effect, the secondary flow into the labour force (by those who would have otherwise been SA participants but did not find employment) is reflected by decreased mean employment rates in the empirical models of table 8.

5. Discussion and interpretation

SA reforms in Canada continue to spark controversy. This paper addresses the descriptive question of whether new reforms actually achieved their stated goal of

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

TABLE 8
Log(# Employed), employment rate and log(# Labour Force)

Variables	logEMPLOYMENT		EMPLOYMENTRATE finely coded new reforms		logLABOURFORCE		EMPLOYMENTRATE coarsely coded new reforms		logLABOURFORCE			
	D+PFE+YFE	t	D+PFE+YFE	t	D+PFE+YFE	t	E+PFE+YFE	t	E+PFE+YFE	t		
<i>Standard reform tools</i>												
logBENEFITS.SINGLE.	0.09	1.4	3.27	2.0	0.04	0.5	0.01	0.2	5.17	2.3	-0.09	1.2
ONECHILD												
logASSET.THRESH	0.01	1.0	-0.11	0.3	0.02	1.4	-0.01	0.8	0.12	0.3	-0.01	0.8
<i>Labour market policy tools</i>												
logINCOME.2ndQUINTILE	0.40	2.4	4.52	2.1	0.30	1.9	0.37	1.6	8.88	2.6	0.19	0.8
logELINDEX	-0.17	2.9	-10.55	7.8	0.02	0.3	-0.19	2.1	-9.94	5.5	-0.01	0.1
<i>Macroeconomic factors</i>												
REALGDPGROWTH	0.00	0.5	0.01	0.3	0.00	1.0	0.00	0.4	0.01	0.4	0.00	0.7
REALGDPGROWTH _{t-1}	0.00	0.2	0.04	2.7	0.00	0.4	0.00	0.6	0.03	2.7	0.00	0.3
REALGDPGROWTH _{t-2}	0.00	0.4	0.06	2.5	0.00	1.1	0.00	0.9	0.07	2.5	0.00	0.1
<i>New reform strategies (finely coded)</i>												
WORKREQ.STRONG	0.03	0.8	0.73	1.1	0.02	0.4						
WORKREQ.WEAK	-0.01	0.9	0.95	1.8	-0.03	1.5						
DIVERSION.STRONG	0.10	3.1	-1.55	2.0	0.12	3.1						
DIVERSION.WEAK	0.01	0.3	-0.97	2.3	0.01	0.5						
TIMELIMITS	-0.08	2.5	-2.63	2.8	-0.05	1.5						
logEARNINGS.THRESH	-0.02	1.4	0.66	2.7	-0.03	2.2						
EARNINGS.TAX	0.00	0.6	0.05	4.1	0.00	1.9						
THRESH.TAX.INTERACT	0.00	1.2	-0.01	2.1	0.00	1.9						
<i>New reform strategies (coarsely coded)</i>												
NEWREFORM					0.06	2.1			-0.92	1.9	0.06	1.9

reducing the number of Canadians on SA. The evidence presented in this paper answers that question in the affirmative.

As summarized in table 7, our econometric models let the data decide on a ranking of which mechanisms—reductions in benefit levels, tightened eligibility requirements, improved macro-economic conditions or adoption of new reform strategies—had the largest statistical associations with declines in participation. The data suggest that new reforms were the second most important policy reform after reductions in employment insurance benefits. We find that new reform strategies, when coded coarsely as a single variable indicating province-years with three or more new reforms in effect, explain about 10% of the decline in SA participation in Canada since 1994, almost twice the effect size for reductions in SA benefit levels that occurred in most provinces from 1994 to 2009. In the empirical models that disaggregate the effects of different new reform strategies, it appears that work requirements with strong sanctions for non-compliance had the largest effects. The presence of strong work requirements is associated with a 27% reduction in SA participation.

One important limitation of using data aggregated at the province-year level is that the estimates contain no information regarding differential policy effects for vulnerable subpopulations. Estimating the effects of new reform strategies on particular subpopulations such as immigrants (cf., Baker and Benjamin 1995) or lengths of SA spells among childless SA recipients versus those with children (cf., Barrett and Cragg 1998; Hughes and McCuaig 2000) will require further analysis of micro-level data. The new reform policy measures introduced here will hopefully motivate further statistical investigation using micro-data sources to examine how these policy changes influenced rates of entry, exit and participation among different subpopulations.

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