Toward a National Universal Guaranteed Basic Income

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On discute à nouveau d'un revenu garanti ou de base, au niveau du fédéral et des provinces, mais les arguments qui s'opposent à une telle mesure – son coût, son effet de désincitation au travail et le risque qu'elle peut constituer sur le plan électoral – continuent de poser problème. Dans cet article, les auteurs soutiennent qu'un grand projet de revenu garanti ou de base n'est pas nécessaire, puisque revoir certains crédits d'impôt, qui s'autofinancent, en les rendant remboursables, permettrait d'offrir des avantages sociaux mieux ciblés aux familles à faible revenu tout en améliorant l'équité fiscale. À l'aide de paramètres liés à l'impôt et aux transferts de 2015 et d'estimations de coût et de population, les auteurs évaluent le système fédéral de transferts en tant que source de sécurité universelle du revenu, déterminent les revenus qui peuvent être augmentés grâce à l'élimination de certains crédits d'impôt, présentent quatre options qui pourraient être financées à l'intérieur des contraintes budgétaires et évaluent leur performance, puis établissent celle qui, selon eux, constituerait le meilleur choix en matière de revenu universel garanti de base. Ils font ensuite une évaluation plus poussée de cette mesure, et analyse son extension aux systèmes fiscaux et de transferts des provinces. Les auteurs concluent que ce revenu universel garanti de base à la fois fédéral et provincial permettrait effectivement d'offrir des avantages sociaux mieux ciblés aux familles à faible revenu, et de pratiquement éliminer la pauvreté chez tous les citoyens célibataires non âgés, à un coût d'efficacité modéré en termes de désincitation au travail.

Mots clés : revenu de base, sécurité du revenu, équité fiscale, crédits d'impôt, pauvreté, redistribution du revenu

There is renewed discussion of a basic or guaranteed income at both the federal and the provincial levels in Canada, but counterarguments about the cost, work disincentives, and electoral appeal of such schemes remain challenging. In this article, we argue that a grand plan for a basic or guaranteed income is unnecessary because self-financing redesign of existing tax credits to be refundable can better target benefits to low-income families while improving tax equity. Using 2015 tax and transfer parameters and estimates of income and population, we assess the federal transfer system as a source of universal income security, identify the revenues that can be raised through the elimination of selected federal tax credits, present four options that could be financed within that budget constraint, assess their performance, and select our preferred universal basic guaranteed income (UGBI) option. We then provide a more detailed assessment of the impact of our preferred UGBI design and discuss the extension of that design to provincial tax and transfer systems. We estimate that the combined federal and provincial UGBI that we propose would effectively target benefits to low-income households and virtually eliminate poverty for all but single non-elderly individuals at a modest efficiency cost in terms of work disincentives.

Keywords: income security, tax credits, basic income, guaranteed income, labour supply

Introduction

Serious policy discussion of a basic or guaranteed income is again the order of the day in Canada. Quebec's Comité consultatif de lutte contre la pauvreté et l'exclusion sociale proposed a "revenu minimum garanti" pegged at 80 percent of Statistics Canada's Market Basket Measure in 2009 (Clavet, Duclos, and Lacroix 2013), and Ontario announced funding for a basic income pilot project in

its 2016 budget (Ontario Ministry of Finance 2016). At the federal level, the governing Liberals adopted a policy proposal at their recent convention to "develop a poverty reduction strategy aimed at providing a minimum guaranteed income" (Liberal Party of Canada, 2016). This follows implementation in the first budget of the Trudeau government of its election pledge to replace the existing child benefit programs with an enriched Canada Child Tax Benefit that conforms to the basic design of a guaranteed income for families with children.

Current policy discussions and activity reflect long-standing concerns about poverty and income redistribution and the need for a basic or guaranteed income to provide universal income support through the tax system that would depend solely on economic circumstances. The 1971 Special Senate Committee on Poverty recommended the implementation of a federally financed and administered guaranteed annual income to address poverty, and the Macdonald Royal Commission on the Economic Union and Development Prospects for Canada (1985) advocated a Universal Income Security Program (UISP) to replace existing income security programs. The UISP was an explicit call for a program along the lines of negative income tax proposals emanating from the United States that would consist of an income guarantee adjusted for family size and an implicit negative income tax or benefit reduction rate that would reduce the income security benefit until it was eliminated at some appropriate break-even level of family income. Negative income tax plans of this nature were the subject of an ambitious social experiment, the Manitoba Basic Annual Income Experiment, or Mincome, between 1974 and 1978 (Forget 2011; Simpson, Mason, and Godwin 2017) that followed four similar American experiments (Hum and Simpson 1993).

Despite widespread calls for the adoption of some form of universal basic or guaranteed income, progress has been slow. Indeed, the counterarguments to calls for a universal guaranteed income remain daunting. Foremost among these counterarguments has been the potentially prohibitive cost of a scheme of this nature and the potential destruction of work incentives (Hum and Simpson 2001). When governments face so many other concerns and political constituencies, the political risks associated with justifying, devising, and financing a grand guaranteed income plan and winning over the electorate appear prohibitively challenging and could likely remain so. In this article, we argue that the challenges have been misconstrued and that at least a modest universal basic or guaranteed income can be implemented within the current tax framework at minimal cost.

We argue that a grand plan for a basic or guaranteed income is not necessary. Implementing a universal guaranteed basic income (UGBI) amounts to adoption of changes to the tax system that can be essentially self-financing while improving tax equity and the transfer of benefits to those households most in need of income assistance. The absence of significant new financing requirements in what amount to budgetary measures to improve the fairness of the tax system should alleviate political opposition and risk, making our UGBI plan more attractive. The proposal builds on earlier research that links the evolution of tax credits, such as the Goods and Services Tax Credit (GSTC) and the Canada Child Tax Benefit, to a refundable design that constitutes a form of guaranteed income (Hum and Simpson 2001; Simpson and Stevens 2015) and to recent arguments for greater reliance on refundable tax credits to offset rising income inequality (Fortin et al. 2012) and to improve tax equity (Boadway 2011, 2013, 2015).

We begin in the next section with a justification for our proposal. We assess some of the deficiencies of the federal system of income transfers as a source of universal income security based on 2015 parameters and estimates of income and population. In the Federal Non-Refundable Tax Credits section, we then turn to the system of non-refundable tax credits (NRTCs) as the basis for funding a UGBI. In the Reforming the Federal Tax Credit System section, we identify the revenues that can be raised through the elimination of selected federal NRTCs and the refundable GSTC, present four options for a UGBI that could be financed within that budget constraint, and assess their performance on key criteria that lead to our preferred option. The UGBI Impact on Family After-Tax Incomes section provides a more thorough explanation of our methodology and a more detailed assessment of the impact of our preferred UGBI design on the benefits received, labour supply response, and disposable income of adults in different types of Canadian families. In the Provincial UGBIs section, we extend the implementation of our preferred option to the provinces, describing the provincial system of NRTCs, the conversion of these credits to a refundable design consistent with the federal UGBI, and the distribution of net benefits that would arise from a provincial component of the UGBI. The Combined Federal and Provincial UGBIs section then estimates the combined federal and provincial UGBI and presents its impact on total benefits received, labour supply, poverty, and income distribution. The final section provides a summary of our analysis and its limitations and the prospects for future research and policy direction.

Federal Income Transfers

In the absence of a universal income security program, what is the state of Canada's income security system at the federal level? We use Statistics Canada's Social Policy Simulation Database and Model (SPSD/M; Statistics

Table 1: Federal Expenditures on Income Support ($M) and Benefits per Adult by Type of Family and Benefit—2015

| Type of Benefit | Total | Type of Nuclear Family | | | | | |
		Single Parent	Two Parent	Single Non- Elderly	Couple Non-Elderly	Single Elderly	Couple Elderly
Benefit, $							
Old Age Security	36,478.8	30.5	110.6	0.0	0.0	15,452.3	20,885.4
Guaranteed Income Supplement	10,280.8	19.8	80.7	0.0	0.0	6,641.2	3,539.1
Spouse's Allowance	696.4	0.0	4.1	267.4	0.0	0.0	424.9
Canada Child Benefit	5,743.0	1,434.8	4,308.3	0.0	0.0	0.0	0.0
National Child Benefit Supplement	3,302.3	1,413.4	1,888.9	0.0	0.0	0.0	0.0
Universal Child Care Benefit	7,634.3	1,065.1	6,569.2	0.0	0.0	0.0	0.0
Goods and Services Tax Credit	4,285.9	378.8	486.9	1,944.9	311.4	782.0	382.0
Working Income Tax Benefit	1,426.5	149.7	191.3	875.1	197.0	2.7	10.4
Total ($M)	69,862.6	4,493.3	13,642.6	3,095.2	510.0	22,879.2	25,242.1
% adults receiving any benefit	60.3	100.0	67.7	69.1	10.6	98.1	85.5
Average per adult receiving benefits, $	4,028	6,175	3,234	536	692	9,260	7,377
Average benefit for all adults, $	2,427	6,175	2,190	371	73	9,082	6,310

Source: Statistics Canada (2016a). Calculations by the authors.

Canada, 2016a) in this section to examine how low-income Canadian households have been treated by the tax and transfer system. SPSD/M is a useful vehicle for this exercise because it uses individual administrative data from personal income tax returns and unemployment claimant histories as well as survey data on family incomes, employment, and expenditure patterns to provide a detailed and microstatistically representative sample of Canadians for simulation exercises (Statistics Canada 2013). Although the software does not include behavioural responses to policy simulations, we are able to model labour supply responses using elasticities applied to tax rate changes, as explained in the Reforming the Federal Tax Credit System section of this article and in the Appendix. Our initial focus is the federal system of tax and transfer benefits because we are interested in a national plan that would require federal leadership and a significant federal component. We turn to provincial considerations in the Provincial UGBIs section because any changes to federal tax and transfer arrangements would have implications for those provinces whose programs and tax arrangements are integrated with the federal system, and we would anticipate provincial consultation and response to any federal initiative.

We begin by considering estimated federal expenditures on income security in 2015 in aggregate and by family type.[1] The first two data columns of Table 1 summarize 2015 income support expenditures across a range of programs.[2] They include benefits for seniors ($46.8 Bn), child benefits ($16.7 Bn), the GSTC ($4.3 Bn), and the Working Income Tax Benefit ($1.4 Bn). Total federal income support benefits of $69.9 billion provide an average benefit of $4,028 to 60 percent of Canadian adults, or an average benefit of $2,427 for all adults, including those who receive no benefit.

The remaining columns of Table 1 indicate how these expenditures are distributed across different types of families and how each type of family fares in terms of the average benefit per adult and the extent of benefit coverage. It is perhaps not surprising to see that different types of families are treated quite differently in the current federal system. Thus, federal child benefits ensure that every parent who is single receives a benefit, an average of $6,175, and most two-parent families (68 percent) receive a more modest average benefit of $3,234 per adult. Similarly, old age benefits ensure virtually all single elderly individuals (98 percent) receive a benefit averaging $9,260, and most elderly couples (85 percent) receive an average benefit of $7,377 per adult. By comparison, non-elderly individuals without children receive very little. Although 69 percent of single adults receive a benefit, the average benefit is only $536, or an average of only $371 for all single adults. Childless couples receive even less as a group, because only 11 percent receive any benefit, and the average benefit for all childless couples is only $73.

Low benefit levels and low coverage may simply reflect high income, because each of the benefits is conditioned on income to some degree. Table 2 therefore shows total benefits, the extent of benefits coverage, and the average adult benefit in low-income households defined by the Statistics Canada low income cutoff (LICO) after tax, which is the conventional and most recognized index of Canadian poverty. The bottom part of Table 2 shows the incidence and depth of poverty for all families within each family type,[3] indicating that the table refers to benefits in the 8.8 percent of households below the LICO and that the incomes of these households fall short of the poverty standard by an average of 35.9 percent. As one would expect, federal benefits

Table 2: Federal Expenditures and Benefits per Adult for Income Support Programs in Low-Income Households—2015

Type of Benefit	Total	Single Parent	Two Parent	Single Non- Elderly	Couple Non-Elderly	Single Elderly	Couple Elderly
		Type of Nuclear Family					
Total ($M)	6,921.9	903.8	1,687.1	806.8	153.7	2,861.9	508.7
% adults receiving any benefit	89.8	100.0	96.1	95.2	54.4	100.0	59.1
Average per adult receiving benefits ($)	3,057	8,058	5,610	570	941	13,010	9,753
Average benefit for all adults ($)	2,745	8.058	5,389	542	512	13,006	5,769
Poverty rate (2014; %)[a]	8.8	23.7	5.1	31.2	4.5	11.3	1.0
Depth of poverty (2014; %)[b]	35.9	25.1	28.1	46.8	39.5	16.3	31.9

[a]   Poverty rate refers to the percentage of families whose income falls below the poverty standard (the after-tax Low-Income Cutoff) for their family and community size.

[b]   Depth of poverty refers to the average percentage by which the income of families lies below the Low Income Cutoff standard.

Source: Statistics Canada (2016a, 2016b). Calculations by the authors.

coverage is higher for the low-income population, because 90 percent of adults in low-income households receive benefits compared with 60 percent of all adults, as shown in Table 1. Although benefits coverage is higher, however, benefit recipients actually receive less money, an average of only $3,057 for each adult receiving benefits in a low-income household compared with $4,028 for all adults, as shown in Table 1. As a result, the average benefit for all adults in low-income households ($2,745) is only slightly higher than the average benefit for all adults shown in Table 1 ($2,427).

Disaggregated by family type, families in low-income households generally do better than households at all income levels in terms of coverage and average benefits per adult. Again, however, the non-elderly single individuals and childless couples do much worse than other families, either those that are elderly or those with children, in terms of coverage, average benefits per recipient adult, and average benefit for all adults in the group. Indeed, the average adult benefit across all family types in Table 2 is lower for the low-income group than for all income groups in Table 1 because single non-elderly adults, whose average benefits are very low compared with those of other family types, are more heavily represented in the low-income population.

Table 2 suggests that, as a system of universal income support, the federal system of income transfers appears to leave much to be desired in terms of the adequacy of benefits and equitable treatment of different Canadian adults. Federal transfers seem to be inadequate because many households remain below the LICO poverty standard and the depth of their poverty is substantial, although provinces share responsibility for this state of affairs, as we discuss in more detail later. Transfers appear to be inequitable because of the large differences in the amount transferred to different family types. In particular, families with children and older adult households receive most federal transfer payments, and households without children are largely forgotten. Accordingly, we argue that the apparent limitations of the federal system of transfers justify contemplation of a more targeted and universal income security program, especially if that program can be financed by arguably modest changes to the current system of federal tax credits, which we now consider.

Federal Non-Refundable Tax Credits

Federal governments have instituted a variety of tax credits to reduce tax liabilities and to provide incentives for specific activities. Most of these tax credits are non-refundable; that is, the credit can only be used to reduce taxes owing, and taxpayers without sufficient taxes owing receive a diminished credit, an asymmetric tax treatment that works against low-income taxpayers and families (Boadway 2013, 3). Table 3 provides a list of the major NRTCs in place in 2015, an estimate from SPSD/M of the amount provided by each benefit across the population, the average impact of each benefit on taxpayer disposable income, and the distribution of those benefits across different family income levels in LICO units.

We estimate in Table 3 that NRTCs provided more than $63 billion in benefits in 2015. Although those benefits arose from a wide variety of credits, the Basic Personal Amount accounted for almost $37 billion, or 60 percent, of all benefits realized and provided a 3.5 percent boost to taxpayer incomes. The age and pension income NRTCs provided $4.9 billion in benefits, or 7.9 percent of the total, and raised taxpayer disposable income by 0.5 percent. The employment and charitable donation NRTCs each provided about $2.5 billion (3.9 percent) and the married and equivalent and the family tax cut NRTCs each provided about $2 billion (3.2 percent), but these NRTCs only improved taxpayer disposable income by about 0.2 percent, and other NRTCs are smaller still.

Table 3: Nonrefundable Tax Credits and their Impact on Taxpayer Incomes by Type of Credit and Family Income—Canada 2015

Non-Refundable Credit	All Taxpayers		Taxpayers by Family Low-Income Status (% Increase)				
	Total Benefits ($M)	Impact on Disposable Incomes (% Increase)	Under LICO[a]	$1-2\times$ LICO	$2-3\times$ LICO	$3-4\times$ LICO	$\geq 4\times$ LICO
Basic	36,978.7	3.50	4.80	5.00	4.30	3.60	2.10
Age and pension income	4,899.8	0.46	0.16	0.86	0.70	0.43	0.17
Married and married equivalents	1,999.1	0.19	0.16	0.35	0.30	0.15	0.07
Employment income	2,450.1	0.23	0.15	0.26	0.29	0.27	0.17
CPP contributions	4,032.8	0.38	0.12	0.34	0.47	0.47	0.31
EI contributions	1,532.2	0.14	0.05	0.13	0.18	0.18	0.12
Fitness and transit	402.2	0.04	0.04	0.05	0.06	0.04	0.02
Family and caregiver[b]	208.5	0.02	0.02	0.03	0.03	0.02	0.01
Disability	586.7	0.06	0.02	0.06	0.08	0.06	0.03
Total education[c]	1,261.4	0.12	0.09	0.17	0.15	0.12	0.08
Medical expenses	1,165.8	0.11	0.03	0.11	0.16	0.12	0.08
Charitable donations	2,571.9	0.24	0.02	0.07	0.18	0.22	0.38
Family tax cut credit	1,959.6	0.18	0.03	0.16	0.32	0.20	0.11
Total[d]	63,394.8	6.00	8.30	8.90	7.40	5.90	3.60

Note: CPP = Canada Pension Plan; EI = Employment Insurance; LICO = low income cutoff.

[a]   LICO is after tax from Statistics Canada.

[b]   Includes the caregiver and the family caregiver tax credits.

[c]   Includes interest on student loans, tuition, education, and textbook tax credits.

[d]   The totals will be different from the sum of the individual items because of the joint effect of multiple tax credits on tax paid.

Source: Statistics Canada (2016a). Calculations by the authors.

The remaining columns of Table 3 indicate how the benefits from the NRTCs were distributed across the family income spectrum. For example, the Basic Personal Amount, which is the largest and most universally applicable NRTC, improved the disposable income of taxpayers in families with incomes below the LICO by 4.8 percent, but individuals in families with incomes between one and two times the LICO received a 5 percent increase, and individuals in families two to three, three to four, and four or more times the LICO received 4.3 percent, 3.6 percent, and 2.1 percent increases in disposable income, respectively. Because the average benefit for all individuals is 3.5 percent of disposable income, these results suggest that the Basic Personal Amount is progressive in the sense that those with lower incomes (up to four times the LICO) receive a larger-than-average increase in disposable income from the credit. However, the Basic Personal Amount does not provide the largest benefits to those at the bottom of the income distribution (below the LICO), a consequence of the design of the NRTC to provide benefits only to those with taxes owing. Moreover, many of the other NRTCs do not appear to be progressive at all. The Employment Insurance tax credit improves the family incomes of those below the LICO by only 0.05 percent, far less than all other income groups, and similar patterns are observed for the Canada Pension Plan contributions, age and pension income credit, the

employment income credit, the disability credit, the family tax cut credit, and the charitable donations tax credit. Thus, the total effect of all NRTCs is that the largest benefit payments are not directed to those taxpayers in the poorest families.

Our assessment is that the system of federal income tax credits can be improved to provide better income support for Canadians. In particular, the benefits provided to those taxpayers in families with the lowest incomes are limited by the non-refundable design of most of these credits. We argue in the next section that this system can be fairly simply redesigned at arguably modest cost to address this issue and form a national UGBI.

Reforming the Federal Tax Credit System: Financing and Design of a UGBI

Financing the UGBI

As we note in the introduction, a key feature of our proposal for a UGBI is that it is essentially financed through the elimination of selected NRTCs and the federal GSTC. As noted earlier, we think that this method of financing has several advantages. First, it requires practically no additional tax revenues because the NRTCs are effectively expenditures in the form of foregone tax revenue, and the UGBI represents a reallocation of these tax expenditures from higher income to lower income Canadians

Table 4: Sources of Financing and Budget for the UGBI

2015 Tax Credits	Expenditure ($M)
Non-refundable tax credits	
Basic	36,978.7
Age and pension income	4,899.8
Fitness and transit	402.2
Total education	1,261.4
Family tax cut credit	1,959.6
Total[a]	46,639.1
Refundable Tax Credits	
Goods and Services Tax Credit	4,285.9
Total revenue ($M)	50,925.0
Total Loss of Disposable Income/Budget for UGBI	51,177.2

Note: UGBI = universal basic guaranteed income.

[a]   The total of all of the tax credits taken together is slightly higher than the sum of the credits taken individually ($45.5 Bn) due to the combined effect of the credits on taxes paid.

Source: Statistics Canada (2016a). Calculations by the authors.

in the form of an almost equal-cost refundable tax credit. Second, because the removal of the NRTCs raises the taxes paid by the lowest income tax filers, an offsetting refundable tax credit should be provided to avoid making them worse off, pre-empting competing claims for the freed-up tax revenues. Third, by defining the method of financing the UGBI at the outset, the budget constraint for the UGBI is established first, and a more limited set of design options can be considered that fits that constraint. Fourth, by defining the method of financing the UGBI, the combined effects of the method of financing and the receipt of benefits on income redistribution and labour supply can be estimated, providing a comprehensive basis for assessing the design options.

Table 4 presents the existing tax credit programs that would provide the funds for our proposals. The UGBI would thereby replace three fixed-amount NRTCs—the basic, age, and pension income credits—and several smaller variable-amount NRTCs, including the fitness, transit, education,[4] and family tax cut credits. The remaining NRTCs would be left in place, including the credits for married and married equivalents, caregiver, disability, charitable donations, medical expenses, Employment Insurance and Canada Pension Plan contributions, and employment. These measures would provide $46.6 billion from the elimination of a broad range of NRTCs and $4.3 billion from the elimination of the GSTC for a total of $50.9 billion in additional tax revenue. The UGBI is designed to fully replace the loss in disposable income of $51.2 billion from these measures, which is only slightly (0.5 percent) greater than the additional tax revenue generated, as shown in Table 4.[5]

Our selection of the tax credits to be eliminated to fund a UGBI may certainly be debated, although we would argue that the Basic Personal Amount must be eliminated because it is by far the largest federal credit and one that is currently of no benefit to those with insufficient taxable income who require assistance under a UGBI. This tax inequity is corrected by making the Basic Personal Amount refundable as the largest component and cornerstone of our proposed UGBI. We would argue that the age and pension income credits should also be eliminated because they favour elderly persons with the same income as non-elderly adults. We think that the education tax credits should be eliminated because single young adults would be eligible for their own UGBI, which they can use to pursue their education. The family tax cut credit is another NRTC that is of no benefit to families without sufficient taxes owing.[6] We would also eliminate the fitness and transit tax credits because they are mildly regressive, and we are not aware of any evaluation that suggests they promote the desired behaviour. We leave the remaining tax credits in place because they compensate for direct and often unplanned expenditures (in the case of the medical expenses tax credit), they promote the non-profit sector (in the case of the charitable donations credit), or, in the case of the married and married equivalent and the disability and caregiver tax credits, they assist in the achievement of marriage neutrality and horizontal equity that is important to the design of the tax system (Adam et al. 2010).

Design Options

Our budget constraint of $51.2 billion in Table 4 for a UGBI still permits a myriad different refundable tax credit options, defined by two components: a benefit reduction rate t and an income guarantee G that is typically adjusted for family size and determines the full benefit payment when no taxable income is available.[7] Given our budget constraint, increases in the level of G must mean corresponding increases in the rate t at which benefits are reduced as taxable income rises. These two components of a refundable tax credit in turn define the break-even level B of income (for any given family size) at which the refundable credit no longer applies:

$$B = G/t > G, \quad 0 < t < 1. \tag{1}$$

We choose benefit reduction rates that range from the current rate of 15 percent applied to NRTCs to rates of 35, 50, and 75 percent that have been considered in discussions of a guaranteed annual income.[8] The guarantee G is then determined by the predetermined budget as a benefit adjusted according to family size. Our UGBI options use a standard equivalence scale that reflects economies of scale in consumption (Organisation for Economic Co-operation and Development 2011).[9] We also use net nuclear family income—the sum of market income, pension income, and federal transfer payments

Table 5: Parameters of UGBI Options for Our Proposed Federal Budget ($51.18 Billion)

Family Size	t = 15%		t = 35%		t = 50%		t = 75%	
	G	B	G	B	G	B	G	B
1	6,657	44,380	10,384	29,668	12,648	25,296	15,885	21,180
2	9,414	62,760	14,634	41,811	17,887	35,774	22,465	29,953
3	11,530	76,867	17,986	51,388	21,907	43,814	27,514	36,685
4	13,314	88,760	20,768	59,337	25,296	50,592	31,771	42,361
5	14,885	99,233	23,219	66,340	28,282	56,564	35,521	47,361
6	16,306	108,707	25,435	72,671	30,981	61,962	38,911	51,881
≥7	17,613	117,420	27,473	78,494	33,463	66,926	42,029	56,039

Note: Values in $. Top-up for disability and infirm dependents = $1,500; top-up for caregivers = $750. (See footnote 10.) B = break-even income level; G = income guarantee; t = benefit reduction rate.

less allowable deductions[10]—to determine the guarantee in our analyses, because the nuclear family (spouses or lone parent plus never-married children aged younger than 18 years) is the family unit recognized by Canada Revenue Agency for filing income taxes. When the family includes two adults, however, the value of the net family benefit is split equally, and separate payments are issued to each adult. The choice of the nuclear family as the filing unit means that unmarried young adults living with their parent or parents will be considered a separate family unit, and the net value of their guarantee will be based on just their income. For those claiming the federal disability, infirm dependents, and caregiver tax credits, the guarantee will be increased by a fixed amount that is consistent with current practice.[11] All those who are permanent residents of Canada and who have filed a tax return in the previous year will be eligible for the UGBI but, because SPSD/M excludes the on-reserve population, reserve residents are excluded from our simulations. Accordingly, the parameters of the representative options we consider are set out in Table 5.

As Table 5 indicates, options involving a higher income guarantee G and a correspondingly higher benefit reduction rate t to satisfy the budget constraint result in a lower break-even income level B, which reduces the number of people in the population who receive the refundable credit. This constitutes an important trade-off in the design of a UGBI for a specific budget—a more generous G requires a higher t and a lower B that target benefits from the refundable credit to a smaller number of low-income families, whereas a less generous G allows for a lower t and a higher B that extends the refundable tax credit benefits to more families at the lower end of the income spectrum. In turn, the choice of UGBI option (parameters G and t) will affect the impact of the program on poverty measures, the distribution of after-tax income, and the percentage of the population who gain from the program. In addition, we cannot ignore the impact of the choice of UGBI on labour supply among low-income families and across the population, because this will ultimately affect program benefits and the effectiveness of the program as well as its ultimate efficiency cost.

Labour Supply Response

Labour supply response has long been an issue in the discussion of a guaranteed annual income. Indeed, it was the focal point of ambitious social experimentation on various negative income tax designs in the United States and Canada during the 1970s (Hum and Simpson 1993). Because the basis of our UGBI proposal is a refundable tax credit that is essentially a guaranteed annual income in its design, labour supply response remains an important consideration in the evaluation of UGBI options with implications for the determination of the net impacts of the UGBI on disposable income and poverty reduction.

The UGBI options set out in Table 5 involve the receipt of a refundable tax credit by lower income taxpayers that is financed by the removal of many of the existing NRTCs, resulting in changes in both tax rates and disposable income that affect labour supply. Figure 1 illustrates these changes in the simple but illustrative case of a single adult with a single NRTC, the Basic Personal Amount, for the first option in Table 5 with a benefit reduction rate of 15 percent. The first tax change created by the introduction of a UGBI and elimination of NRTCs is an increase in the tax rate on earnings for those receiving the UGBI that results from the introduction of the UGBI benefit reduction rate of 15 percent, as indicated by the downward sloping UGBI line in Figure 1. At the break-even point at which the UGBI is reduced to zero, this tax rate on earnings disappears. The second tax change occurs for those with taxable incomes below the value of the NRTC, which is income below $11,317 (the value of the Basic Personal Amount in 2015) in Figure 1. These taxpayers face a 15 percent tax rate on income that was previously untaxed. Thus, this group now faces a combined tax rate on earnings of 30 percent.
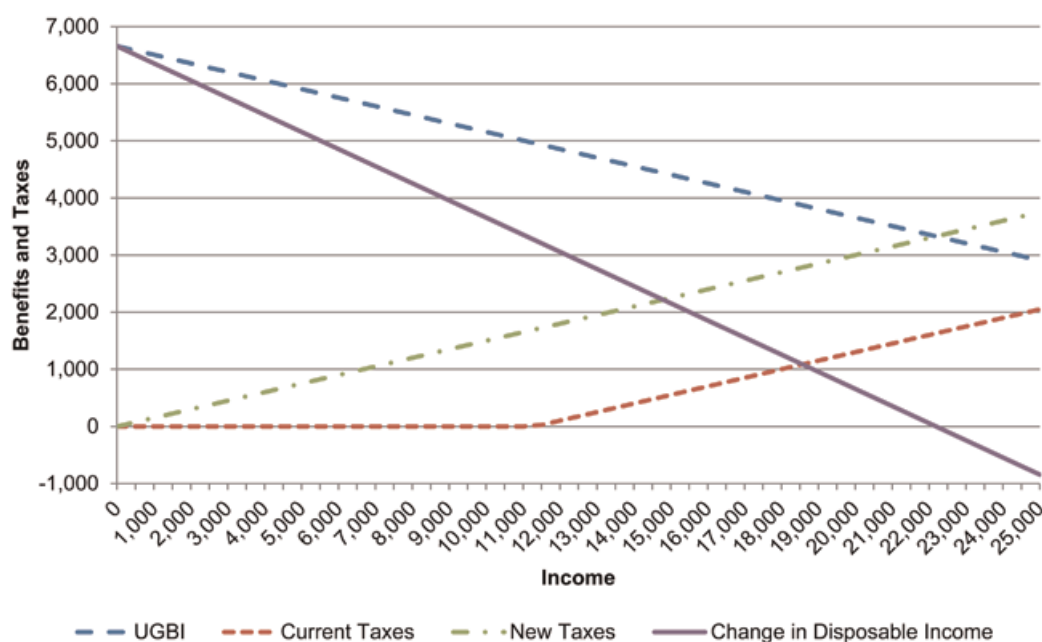
Figure 1: Change in Disposable Income Due to UGBI Financed by Removal of NRTCs.
Note: NRTCs = non-refundable tax credits; UGBI = universal basic guaranteed income.
Source: Statistics Canada (2016a). Calculations by the authors.

However, once this group's taxable income rises above the value of the NRTC, there is no change in the personal income tax rate on earnings, and they face only the 15 percent benefit reduction rate of the UGBI. The compensated wage or substitution effect at the intensive margin (for those working positive hours) and the participation effect at the extensive margin (for those not working) of the increased tax rate on earnings results in a reduction in labour supply that is estimated by applying assigned (positive) substitution and participation elasticities to the change in the tax rate on earnings, as formulated in the Appendix Equations (A.6) and (A.7).

In addition to these effects resulting from tax rate changes, labour supply will also be affected by the change in disposable incomes induced by the provision of the UGBI. This change is indicated by the solid line in Figure 1, which represents the vertical distance between the UGBI and New Taxes lines. It is positive up to the point at which the value of the UGBI is greater than the increase in taxes paid to finance the UGBI, which is $22,190 for the case illustrated in Figure 1. Up to this level of income, the higher incomes from a UGBI will induce a reduction in labour supply that can be estimated by applying an assigned (negative) income elasticity to the positive change in disposable income. For those with higher incomes who face a loss in disposable income, the income effect will lead to increased labour supply, which can similarly be estimated by applying an assigned income elasticity to the negative change in disposable

income, as in Appendix Equation (A.8). Thus, there are offsetting income effects that are negative for lower income tax filers and positive for higher income tax filers. Total labour supply response is the sum of these substitution, participation, and income effects, as in Equation (A.9) in the Appendix.

We derive consensus estimates of the substitution, income, and participation elasticities from Table 2 of McClelland and Mok (2012, 30). Their review of recent research in the United States indicates a likely range for income elasticity of 0.0–0.1 for men and women, a likely range for substitution elasticity of 0.1–0.3 for men and single women and 0.2–0.4 for married women, and a likely range for the participation elasticity of 0.0–0.1 for men and single women and 0–0.3 for married women. We note that these estimates are consistent with the range of uncompensated wage elasticity estimates ranging from 0.23 to 0.32 based on earlier studies in Evers, de Mooij, and van Vuuren (2005). Although labour supply elasticities may vary across the income distribution, there is insufficient information in our sources on this issue. Also, although higher income earners might be more responsive, the impacts of the UGBI will be primarily on adults in low-income families.

To evaluate the labour supply response to our conversion scenarios, we use the midpoint of these ranges—an income elasticity of 0.05, substitution elasticities of 0.2 for men and single women and 0.3 for married women, and participation elasticities of 0.05 for men and single

Table 6: Impacts on Families Gaining, Poverty and Income Distribution Measures, and Labour Supply of UGBI Options for Our Proposed Federal Budget ($51.18 Bn)

| | | Performance Indicator | | | | Labour Supply Effect (% Change in Earnings) | |
Benefit Reduction Rate (t; %)	Guarantee (G; $)[a]	% of Families Gaining[b]	% Change in Poverty Rate[b]	% Change in Depth of Poverty[b]	% Change in Gini Index[b]	Low Income	All
15	13,314	39	−41	−17	−3.3	−7.2	−1.0
35	20,768	32	−50	−37	−3.2	−12.7	−0.9
50	25,296	29	−46	−46	−3.1	−16.5	−0.9
75	31,771	27	−20	−59	−1.4	−21.5	−0.9

Note: NRTC = non-refundable tax credit; UGBI = universal guaranteed basic income.

[a] For a family of four persons.

[b] Based on after-tax income after accounting for labour supply response and changes in taxes payable resulting from the elimination of the NRTCs and receipt of the UGBI.

Source: Statistics Canada (2016a). Calculations by the authors.

women and 0.15 for married women. Because the range of elasticity estimates from McClelland and Mok (2012) is not wide, we do not conduct sensitivity tests on labour supply response in this article.

Design Impacts and Our Preferred Option

By way of showing the trade-offs involved in the design of a UGBI in the form of a refundable tax credit, Table 6 presents four equal cost options for our predetermined budget of $51.18 billion. It shows the effect of each option on a series of outcome measures that bear on the decision of the most suitable option, including the proportion of families who gain from each option, the changes in the incidence and depth of poverty to reflect the specific income redistributive effects on low-income households, the change in the Gini index to reflect more general income redistributive effects, and the change in labour supply for both the low-income and the total adult populations. The effects of each option reflect our estimates of labour supply response and the subsequent change in the value of the UGBI and federal taxes paid. That is, once earnings decline, there will be an offsetting rise in the value of the UGBI given the inverse relationship between earnings and the size of the UGBI and a corresponding decline in income taxes.[12] To approximate the impact on taxes paid with SPSD/M, we calculate the basic tax payable on taxable income before and after labour supply response using the federal tax table. We then calculate the final tax payable on the basis of the actual ratio of final to basic tax payable with the removal of the NRTCs for both scenarios to determine after-tax income.[13]

The results in Table 6 show that UGBI options with a rising guarantee and benefit reduction rate, corresponding to a lower break-even level of income as outlined in

Table 5, are naturally associated with a reduced proportion of the population who gain from the replacement of NRTCs and the GSTC. However, the income redistributive effects of the options are mixed. As the guarantee and benefit reduction rate increase, there are greater reductions in the depth of poverty, but the decline in the poverty rate peaks for a benefit reduction rate of 35 percent. Indeed, the reduction in the incidence of poverty is greater for a benefit reduction rate of 15 percent than for the most targeted option with the benefit reduction rate of 75 percent. In addition, the Gini index shows a similar decline of about 3 percent for each option except the one with highest reduction rate of 75 percent, reflecting the greater weight placed by the Gini index on redistribution in the middle of the income spectrum (Johnson and Smeeding 2015), associated with a greater break-even level achieved by a lower guarantee and benefit reduction rate.

An important consideration is labour supply response, and here there are quite dramatic differences for the low-income families most affected by the UGBI. The second-to-last column of results in Table 6 for our four UGBI options indicates that, as the benefit reduction rate increases, there is a greater labour supply response for low-income families. For the plan with a 15 percent benefit reduction rate, the labour supply response in low-income families reduces earnings by 7.2 percent. For the options with rates of 35 percent, 50 percent, and 75 percent, earnings decline by 12.7 percent, 16.5 percent, and 21.5 percent, respectively. This is the expected pattern of earnings loss, because higher tax (benefit reduction) rates correspond to larger labour supply response at the intensive and extensive margins. It is also an important consideration, because greater labour supply response associated with higher effective tax rates reflects a greater efficiency

Table 7: Simulated Labour Supply Effects on Earnings by Tax Filer Family Income

After-Tax LICO Level of Family Income	Average Earnings Per Adult ($)	Average $ Value (% of Earnings)			
		Total Effect	Substitution Effect	Participation Effect	Income Effect
Below LICO	4,162	−299 (−7.2)	−182 (−4.4)	−52 (−1.2)	−65 (−1.6)
1–2 × LICO	13,250	−552 (−4.2)	−406 (−3.1)	−129 (−1.0)	−18 (−0.1)
2–3 × LICO	27,905	−384 (−1.4)	−311 (−1.1)	−100 (−0.4)	+27 (+0.1)
3–4 × LICO	40,350	−142 (−0.4)	−141 (−0.3)	−41 (−0.1)	+40 (+0.1)
≥4 × LICO	72,401	−62 (−0.1)	−82 (−0.1)	−22 (−0.0)	+42 (+0.1)
Total	32,326	−321 (−1.0)	−254 (−0.8)	−79 (−0.2)	+12 (0.0)

Note: LICO = low income cutoff.
Source: Statistics Canada (2016a). Calculations by authors based on labour supply elasticities in McClelland and Mok (2012): substitution elasticities of 0.2 for men and single women and 0.3 for married women, participation elasticities of 0.05 for men and single women and 0.15 for married women, and income elasticity of 0.05 for all tax filers.

cost or deadweight loss (Hausman 1985). For all families, the last column indicates that labour supply response is small and similar in size for each option, although this largely reflects the fact that the effect of the UGBI is negligible for the substantial segment of families with higher incomes.

To present a detailed proposal in the space available, we now select a single option from the simulation analysis in Table 6 for further assessment. For several reasons, our choice for further analysis is the option with a 15 percent benefit reduction rate and a guarantee of $13,314 for a family of four. First, retaining the same 15 percent rate that is currently applied to the gross value of NRTCs maintains consistency with the existing tax system while still delivering significant poverty reduction and income redistribution. Second, the 15 percent option keeps labour supply response, and correspondingly the efficiency cost of the UGBI, relatively low in comparison with the other options. Third, as we discuss in Provincial UGBIs and Combined Federal and Provincial UGBIs sections, we anticipate some degree of provincial participation in the UGBI, which will result in a stacking of the marginal tax rates on earnings. Thus, the 15 percent option provides room for provincial participation at modest combined benefit reduction rates, as we elaborate in the Combined Federal and Provincial UGBIs section. Fourth, the 15 percent option with larger break-even income levels provides UGBI benefits to a larger segment of Canadian families than the other options, which we think will enhance its attractiveness to the Canadian public in the same fashion as the new Canada Child Benefit.

UGBI Impact on Family After-Tax Incomes
In this section, we consider in more detail the impact of our proposed UGBI on family incomes. Because this impact reflects labour supply response to the changes in taxes and transfers of the UGBI, we begin with a more detailed assessment of the changes in earnings that arise

from our analysis of the substitution, participation, and income effects as described in the Labour Supply Response section and the Appendix. Table 7 breaks down labour supply response to our preferred UGBI option by family income of the tax filer in LICO units.

As we suggested earlier, labour supply response at the intensive and extensive margins is expected to be larger for lower income families who benefit the most from the UGBI but who also face higher effective tax (benefit reduction) rates. Table 7 shows that the increased tax rate on earnings for families with incomes below the LICO leads to a 5.6 percxent decline in their employment income as a result of substitution and participation effects. The combined substitution and participation effects decline steadily with income from 4.1 percent for families with incomes one to two times the LICO, 1.5 percent for families with incomes two to three times the LICO, 0.4 percent for families with incomes three to four times the LICO, and just 0.1 percent for families with incomes exceeding four times the LICO. Overall, the substitution and participation effects reduce earnings by 0.8 percent and 0.2 percent, respectively, according to our estimates, whereas the income effect for all families is negligible. For families below the LICO who receive the largest UGBI benefits, the income effect reduces earnings by 1.6 percent, but the positive effect in higher income families completely offsets this loss.

The reduced earnings from labour supply response result in higher UGBI benefits and program costs rise by about $1.71 billion, or 3.3 percent. Although this would create additional rounds of labour supply response and changes in benefits and program costs, they are small compared with the first-order effects of the UGBI and are ignored here. The reduced earnings also reduce income taxes, which can only be approximated in SPSD/M by calculating the basic tax payable on taxable income from the federal tax tables before and after labour supply response. Final tax payable is then calculated using

Table 8: Size and Distribution of Net UGBI Impacts by After-Tax Income Status of Families

After-Tax LICO Level of Family Income (before UGBI)	% of Nuclear Families[a]	Average Family Income (Before UGBI; $)	Average UGBI ($)	Average Loss of GSTC ($)	Average Earnings Loss (Labour Supply Response; $)	Average Increase in Taxes Paid ($)	Net Impact of UGBI (UGBI − Earnings Change − GSTC − Tax Increase)		% Gaining Income
							Amount ($)	% of After-Tax Income	
Below LICO	10.7	12,652	5,823	394	348	739	+4,342	+34.3	97.9
1–2 × LICO	29.8	29,606	3,922	369	735	1,914	+904	+3.0	55.9
2–3 × LICO	26.7	47,409	1,801	132	562	2,560	−1,453	−3.1	22.9
3–4 × LICO	15.8	63,097	1,185	85	218	2,760	−1,878	−3.0	19.1
≥4 × LICO	17.0	116,541	922	66	99	2,881	−2,124	−1.8	15.1
Total	100.0	55,570	2,620	212	457	2,258	−307	−0.5	38.9

Note: GSTC = Goods and Services Tax Credit; LICO = low income cutoff; UGBI = universal guaranteed basic income.
[a] Includes non-family individuals and families.
Source: Statistics Canada (2016a). Calculations by the authors.

Table 9: Impact of UGBI on Disposable Family Income by Family Type and Income

After-Tax LICO Level of Family Income	Type of Nuclear Family						Total Families
	Single Parent	Two Parent	Non-Elderly Single	Non-Elderly Couple	Elderly Single	Elderly Couple	
Below LICO	+36.0	+24.0	+42.0	+40.1	+13.8	+39.9	+34.8
1–2 × LICO	+7.8	+0.6	+6.6	+0.3	+2.3	+0.7	+3.1
2–3 × LICO	−0.8	−4.6	+1.4	−4.6	−3.2	−6.3	−3.0
3–4 × LICO	−1.3	−3.7	+1.1	−4.0	−2.3	−6.4	−3.0
≥4 × LICO	−0.9	−2.1	+0.4	−2.3	−1.0	−3.0	−1.8
Total	+4.6	−2.3	+4.7	−2.5	+0.3	−3.7	−0.6

Note: Values in table are percentages. LICO = low income cutoff; UGBI = universal guaranteed basic income.
Source: Statistics Canada (2016a). Calculations by the authors.

the ratio of final to basic tax payable for both scenarios. The reduction in final tax payable of $1.06 billion, or $52 per family, represents our estimate of the impact of the UGBI on taxes. Combined with the additional UGBI benefit payments, the loss of tax revenue brings the net cost of the program, after consideration of labour supply effects, to about $2.77 billion, a modest increase of 5.4 percent to the original budget of $50.9 billion, which would require either new funding or slightly lower guarantees.

Table 8 provides our estimates of the net benefits across all families by income category, including the average income gain per family and the proportion of families who gain from our scheme. The 10.7 percent of families who are below the LICO with an average family income of $12,652 receive an average UGBI benefit of $5,823 but lose the GSTC of $394 and earnings of $348 as a result of their labour supply response. The elimination of the NRTCs results in additional taxes of $739, leaving an average improvement in after-tax family income of $4,342, or 34.3 percent, as a result of our proposed

UGBI. Almost all (97.9 percent) of these poorest families receive some additional income support from the UGBI. Moreover, the benefits of the UGBI are effectively targeted to this lowest income group, because the income group one to two times the LICO gains a modest 3.0 percent and other groups experience modest losses overall. The overall effect of the UGBI is a reduction in disposable income across all Canadian families of 0.5 percent.

Table 9 examines the net impact of the UGBI on the disposable income of nuclear families by family type. We noted in the Federal Income Transfers section that single adults fare relatively poorly in the current federal transfer system. These family types appear to be a primary beneficiary of the proposed UGBI because single parents and single non-elderly individuals gain 4.6 percent and 4.7 percent, respectively, whereas other family types that are treated much better under the current system see modest reductions of up to 3.7 percent for elderly couples. Even for elderly couples, however, those below the LICO improve their disposable incomes by a substantial 39.9

Table 10: Impact of the UGBI on Poverty (After-Tax LICO) and Inequality by Family Type

Economic Family Type[a]	Rate of Poverty			Depth of Poverty			Degree of Inequality[b]		
	Pre-UGBI (%)	Post-UGBI (%)	Impact (% Change)	Pre-UGBI (%)	Post-UGBI (%)	Impact (% Change)	Pre-UGBI (%)	Post-UGBI (%)	Impact (% change)
Single parent	17.0	0.7	−95.9	23.3	36.7	+57.5	29.1	24.0	−15.6
Two parent	5.4	0.8	−85.2	25.5	32.6	+27.8	31.5	30.4	−3.5
Non-elderly single	29.6	24.3	−17.9	43.4	29.8	−31.3	41.4	37.6	−9.1
Non-elderly couple	6.2	3.0	−51.6	36.5	25.5	−30.1	36.0	35.0	−2.8
Elderly single	10.3	2.4	−76.7	9.0	5.7	−36.7	30.1	27.3	−9.2
Elderly couple	2.2	0.8	−63.6	35.1	44.4	+26.5	34.0	33.1	−2.4
Total	12.0	7.2	−40.0	34.7	28.7	−17.3	41.3	39.9	−3.3

Note: LICO = low income cutoff; UGBI = universal guaranteed basic income.
a   The LICO measure of low income is based on the economic family unit, which includes extended family members living in the same unit.
b   The Gini index is used with the economic family as the unit of measurement.
Source: Statistics Canada (2016a). Calculations by the authors.

Table 11: Impact of the Federal UGBI by Province

Province	Nuclear Families				Economic Families			Individuals: % Change in Earnings	
	% Gaining	Average Gain (% of Disposable Income)	Average Loss (% of Disposable Income)	Average Benefit ($)	% Change in Poverty Rate	% Change in Depth of Poverty	% Change In Inequality	Low Income Adults	All Adults
NF	38.1	+14.3	−3.7	2,513	−50.0	−23.8	−3.5	−8.0	−0.7
PE	31.6	+17.0	−4.2	2,673	−46.9	−33.5	−3.4	−7.7	−1.5
NS	38.4	+18.1	−4.0	2,689	−38.8	−26.4	−4.6	−8.4	−1.1
NB	37.2	+14.8	−4.1	2,640	−41.4	−22.6	−4.3	−7.2	−1.3
QC	43.0	+15.0	−3.3	2,722	−45.6	−21.7	−4.6	−7.4	−1.3
ON	39.9	+20.4	−3.6	2,750	−38.9	−13.4	−3.5	−7.4	−1.0
MB	37.1	+16.6	−3.9	2,643	−42.5	−13.5	−3.3	−6.8	−1.2
SK	30.6	+16.1	−3.5	2,160	−44.1	−17.8	−2.0	−7.0	−0.8
AB	29.1	+15.2	−3.0	2,000	−36.6	−13.8	−1.1	−7.0	−0.6
BC	39.5	+20.2	−3.7	2,659	−36.1	−23.8	−3.4	−6.7	−1.0
Total	38.9	+17.9	−3.5	2,620	−40.0	−17.3	−3.3	−7.2	−1.0

Note: UGBI = universal guaranteed basic income.
Source: Statistics Canada (2016a). Calculations by the authors.

percent, only slightly less than non-elderly single individuals and couples. Single parents and non-elderly individuals one to two times the LICO also do better, by 7.8 percent and 6.6 percent, respectively. The biggest losses are for elderly couples and two-parent families between two and four times the LICO, but in no case do these income losses exceed 6.4 percent.

Table 10 examines the impact of the UGBI on poverty and income inequality by family type. The UGBI reduces the overall incidence of poverty by 40%; that is, four out of every 10 families with income below the LICO rise above it as a consequence of our proposal. The depth of poverty falls by 17 percent, and income inequality, measured in terms of the Gini coefficient, falls by 3.3 percent. Although poverty incidence and inequality fall for all

groups, single parents fare the best under these measures, because their rate of poverty falls by 96 percent and inequality falls by 15.6 percent. In other words, our UGBI nearly eradicates poverty among single parents as well as cutting poverty incidence at least in half for all other family types except single non-elderly individuals. The depth of poverty actually rises for single parents, two-parent families, and elderly couples, but this reflects the fact that the UGBI removes a significant proportion of each group from poverty, leaving behind those furthest below the poverty standard before the UGBI.

Finally, Table 11 shows that the impact of our proposed UGBI varies considerably across provinces. Alberta has the fewest number of families benefiting from the program at 29.1 percent, and Quebec has the most at

Table 12: Provincial Tax Credits, Tax Rates and Total Revenue—2015

Parameter	NF	PEI	NS	NB	QC	ON	MB	SK	AB	BC
Non-refundable credits										
Basic ($)	8,767	7,708	8,481	9,633	11,425	9,863	9,134	15,639	18,214	9,938
Age ($)	5,596	3,764	4,141	4,704	2,460	4,815	3,728	4,764	5,076	4,457
Pension income ($)	1,000	1,000	1,173	1,000	2,185	1,364	1,000	1,000	1,402	1,000
Education: tuition	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Education: interest on student loans	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Education: full time/part time ($)	200/60	400/120	200/60	400/120	None	531/159	400/120	400/120	708/212	200/60
Low income tax reduction[a]	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes
Fitness	No	No	Yes	No	No	Yes	Yes	Yes	No	Yes
Refundable sales tax credit[b]	Yes	Yes	Yes	No	No	Yes	Yes	No	No	No
Tax rate applied to NRTCs (%)	7.7	9.8	8.79	9.68	20.0	5.05	10.8	11.0	10.0	5.06
Adult population (1,000s)	423.1	120.3	766.2	617.0	6,727.2	11,197.3	978.9	825.6	3,252.2	3,873.9
Total value—provincial ($M)	270.4	112.8	574.6	619.0	14,328.5	7,312.2	1,009.1	1,232.1	5,026.9	2,021.5
% of total (fed. & prov.)	25.5	32.5	28.9	35.0	57.6	26.6	35.4	44.0	45.3	22.2
Per adult value ($)	639	938	749	1,003	2,130	653	1,031	1,492	1,546	522
Total value—federal ($M)	791.8	224.8	1,412.8	1,151.6	10,538.3	20,217.4	1,840.2	1,566.5	6,079.2	7,102.3
Per adult value ($)	1,871	1,869	1,844	1,866	1,566	1,805	1,880	1,897	1,869	1,833
Total federal and provincial ($M)	1,062.2	337.6	1,987.4	1,770.7	24,866.8	27,529.6	2,849.3	2,798.6	11,106.1	9,123.8
Per adult value ($)	2,510	2,806	2,594	2,869	3,696	2,459	2,911	3,390	3,415	2,355

Note: NRTC = non-refundable tax credit.

[a]   NF: single person, $683 reduction up to $18,700; reduction reduced by 16% of net income above threshold; family, $1,063 reduction up to $36,700; reduction reduced by 16% of net income above threshold. PEI: $300 basic + $300 spouse + $250 per child + $250 per senior up to $17,000; reduction reduced by 5% of net income above threshold. NS: $300 basic + $300 spouse + $165 per child up to $15,000; reduction reduced by 5% of net income above threshold. NB: $621.38 basic + $621.38 spouse up to $16,000; reduction reduced by 3% of net income above threshold. ON: $228 basic + $421 per child and disabled person. MB: $2,065 basic + $2,065 spouse + $2,752 per child and disabled person, reduced by 9% of net family income. SK: $243 basic and spouse + $95 per child up to $31,878; reduction reduced by 2% of net family income above threshold. BC: $432 up to $19,000; reduction reduced by 3.5% of net family income above threshold.

[b]   NF: $40 per head and spouse + $60 per child aged younger than 19 y up to $15,000; credit reduced by 5% of net family income above threshold. PEI: $100 + $50 per child + $50 maximum supplement up to $50,000; credit reduced by 2% of net family income above threshold. NS: $255 + $60 per child up to $30,000; credit reduced by 5% of adjusted net family income above threshold. ON: $287 + $287 per child up to $22,057 for single adults & $27,571 for families; credit reduced at 4% of adjusted net family income above thresholds. MB: $195 per adult + $113 per elderly, elderly spouse and disabled + $62 per child; credit reduced at 1% of net family income.

Source: Statistics Canada (2016a). Calculations by the authors.

43.0 percent. The average gain in disposable income is lowest in Newfoundland at 14.3 percent and highest in Ontario at 20.4 percent, and the average family loss from the program is a modest 3 to 4 percent in all provinces. The average UGBI benefit for all families ranges from $2,000 in Alberta to $2,750 in Ontario. Poverty rates fall by 50 percent in Newfoundland but by only 36 percent in British Columbia, and the depth of poverty declines by 33 percent in Prince Edward Island but by only 13 percent in Ontario and Manitoba. The impact on income inequality is greatest in Nova Scotia and Quebec and smallest in Alberta and Saskatchewan. Among low-income individuals, the labour supply effect ranges from 8.4 percent in Nova Scotia to 6.7 percent in British Columbia. These results, however, assume no provincial participation in the UGBI, an issue to which we now turn.

Provincial UGBIs

Our UGBI envisions both a federal platform and provincial participation. Indeed, provincial non-participation would require conscious decisions to change tax arrangements where federal and provincial NRTCs are integrated. Although provinces would be free to design their own UGBI, in this article we present a provincial UGBI that parallels the design and financing of the federal plan. Specifically, our proposal has each province eliminating the same set of NRTCs and provincial sales tax credits to finance a provincial UGBI, adopts the provincial rate used in the calculation of provincial NRTC benefits as the benefit reduction rate for the provincial plan, and sets the guarantee at a level that ensures that the cost of the provincial plan is equal to the loss in disposable income resulting from the elimination of the

Table 13: Provincial UGBI Programs and Post–Labour Supply Impacts—2015

Program Parameters and Impacts	Total[a]	NF	PEI	NS	NB	QC	ON	MB	SK	AB	BC
Parameters											
Guarantee (single adult; $)	–	3,027	3,947	3,297	4,076	7,316	2,290	4,403	5,970	5,760	2,098
Disability top-up ($)	–	500	700	650	775	550	500	675	1,025	1,425	400
Caregiver top-up ($)	–	250	250	450	450	250	250	400	1,025	1,075	225
Benefit reduction rate (%)	–	7.7	9.8	8.79	9. 68	16.0[b]	5.05	10.8	11.0	10.0	5.06
Total cost ($M)[c]	32,560.8	272.2	112.8	573.7	618.9	14,164.4	7,349.1	1,048.8	1,323.6	5,029.5	2,067.8
Impacts											
% gaining	39.3	38.2	41.3	36.8	35.6	42.9	38.9	36.9	38.5	37.9	37.2
Average gain ($)	+1,929	+1,352	+1,756	+1,595	+1,787	+3,358	+965	+1,936	+$2,873	+$2,963	+$1,029
% of disposable income	9.9	6.7	9.4	9.0	9.3	16.9	5.6	10.7	12.9	12.8	6.1
Average loss ($)	−1,622	−1,014	−1,229	−1,139	−1,353	−3,117	−840	−1,522	−2,456	−2,503	−782
% of disposable income	2.2	1.3	1.9	1.8	2.2	4.6	1.1	2.2	2.9	2.6	1.1
Average benefit ($)	1,654	978	1,264	1,095	1,502	3,069	947	1,564	2,407	2,294	770
% change in poverty rate	−24.8	−29.5	−26.6	−17.3	−30.0	−45.6	−12.7	−28.3	−42.4	−36.6	−9.5
% change in depth of poverty	−10.8	−1.2	−23.0	−9.4	−12.5	−27.0	−2.7	−10.8	−13.6	−15.2	−6.6
% change in inequality	−2.9	−1.7	−1.7	−2.0	−2.5	−7.7	−1.0	−2.0	−3.0	−2.3	−1.0
Labour supply response (% change in earnings)											
Low income adults	−3.6	−3.8	−4.3	−3.8	−4.3	−6.0	−2.2	−4.7	−6.4	−6.0	−2.1
All adults	−0.6	−0.3	−0.7	−0.4	−0.7	−1.3	−0.3	−0.7	−1.0	−0.8	−0.3

Note: The total cost of the provincial programs and their impacts on the number of winners, average gain and loss, average benefit, change in poverty and inequality reflect reduced earnings from labour supply response and the offsetting increase in the UGBI and reduced taxes paid. NRTC = non-refundable tax credit; UGBI = universal guaranteed basic income.

[a]   The total impact across all provinces is the population-weighted average of the individual provinces.

[b]   The tax rate for the calculation of the value of the NRTCs is 20%, and the lowest tax rate for the calculation of provincial tax payable is 16%.

[c]   This is the cost of the UGBI before the labour supply impacts.

Source: Statistics Canada (2016a). Calculations by the authors.

NRTCs and any provincial sales tax credit. We also provide similar top-ups to the guarantee for persons claiming the disability tax credit and the caregiver tax credit. As with the federal plan, the provincial guarantees are adjusted for family size, and the same definition of family income is used to calculate the net value of the guarantee. With the exception of Quebec, which administers its own taxation, we see the Canada Revenue Agency administering the provincial plans and adding the provincial benefits to those provided by the federal plan so that recipients receive one combined UGBI payment.[14]

Table 12 presents the NRTCs and sales tax or harmonized sales tax credits that would be eliminated at the provincial level, corresponding to the financing arrangements for the federal UGBI proposal. It also shows the total value of those credits per adult, their corresponding federal amounts, and combined federal and provincial amounts for 2015. The table reveals the considerable interprovincial differences in the value of the NRTCs and the rates at which they are taxed. Saskatchewan and Alberta have the most generous set of tax credits, and Prince Edward Island has the least generous. Quebec has the highest rate for assessing their net value (20.0

percent), followed by Saskatchewan (11.0 percent) and Manitoba (10.8 percent), and British Columbia and Ontario have the lowest rates at only 5.1 percent. As a result, the total value of the tax credits on a per capita basis is much higher in provinces such as Quebec ($2,130), Alberta ($1,546), and Saskatchewan ($1,492) than in Ontario ($653), Newfoundland ($639), and British Columbia ($522). Because per capita federal NRTCs are similar for all provinces except Quebec, the variation in total federal and provincial tax credits in the final row of Table 12 is driven primarily by differences in the value of the provincial credits.

Table 13 summarizes the results of the application of our design principles to develop provincial UGBI plans funded from the elimination of the tax credits described in Table 12. The top half of Table 13 shows the guarantees, along with the disability and caregiver top-ups, that can be funded at the provincial NRTC tax rate. Comparison of the cost of the UGBI with the total budget available from the elimination of the NRTCs from Table 12 reveals a slight increase (0.2 percent) in overall cost over budget ($32.561 Bn vs. $32.507 Bn).[15] The bottom half of Table 13 provides our estimates of the impact on poverty rates

Table 14: Combined Federal and Provincial UGBI Programs and Post Labour Supply Impacts—2015

Program Parameters and Impacts	Total[a]	NF	PEI	NS	NB	QC	ON	MB	SK	AB	BC
Parameters											
Guarantee (single adult; $)	–	9,684	10,604	9,954	10,733	13,973	8,947	11,060	12,627	12,417	8,755
Disability top-up ($)	–	2,000	2,200	2,150	2,275	2,050	2,000	2,175	2,525	2,925	1,900
Caregiver top-up ($)	–	2,000	1,000	1,200	1,200	1,000	1,000	1,150	1,775	1,825	975
Benefit reduction rate (%)	–	22.7	24.8	23.79	24.68	31.0	20.05	25.8	26.0	25.0	20.06
Total revenues ($M)[b]	82,087.0	1,039.7	333.0	1,987.7	1,770.4	24,825.1	26,260.0	2,849.1	2,797.1	11,102.8	9,122.0
Total cost ($M)[c]	83,118.4	954.4	328.6	1,943.8	1,681.6	26,620.7	28,023.8	2,763.6	2,485.1	9,319.3	8,997.4
Adult population (1000s)	28,781.7	423.1	120.3	766.2	617.0	6,727.2	11,197.3	978.9	825.6	3,252.2	3,873.9
Impacts											
% gain	39.8	39.5	39.1	39.4	37.0	44.4	39.4	38.4	34.7	33.8	39.7
Average gain ($)	+5,218	+4,129	+4,653	+4,703	+4,707	+6,486	+4,539	+5,157	+3,992	+5,982	+4,321
% of disposable income	27.8	20.3	25.7	26.0	24.3	31.5	26.7	27.1	28.5	28.5	25.3
Average loss ($)	−4,178	−3,653	−3,920	−3,770	−3,813	−5,187	−3,476	−4,070	−5,247	−5,345	−3,518
% of disposable income	5.6	4.8	6.1	5.8	6.1	7.6	4.7	5.9	6.4	5.8	4.7
Average benefit ($)	4,338	3,511	4,136	3,810	4,208	5,944	3,715	4,209	4,685	4,413	3,440
% change in poverty rate	−56.3	−63.6	−71.9	−58.2	−70.0	−77.6	−44.4	−57.5	−61.0	−58.5	−48.7
% change in depth of poverty	−28.4	−38.1	−45.8	−32.2	−19.5	−47.4	−25.8	−34.3	−62.4	−34.2	−26.4
% change in inequality	−5.5	−5.2	−4.8	−6.5	−6.5	−12.5	−4.4	−5.1	−5.0	−3.5	−4.3
Labour-supply effects (% change in earnings)											
Low-income adults	−10.2	−11.4	−11.5	−11.8	−11.1	−12.2	−9.1	−9.1	−14.2	−13.0	−8.4
All adults	−1.8	−1.1	−2.3	−1.8	−2.0	−2.6	−1.4	−1.5	−2.2	−1.9	−1.3

Note: The impacts on the number of winners, average gain and loss, average benefit, change in poverty and inequality reflect the impact of the reduced labour supply on earnings and the offsetting increase in the UGBI and reduced taxes paid. GSTC = Goods and Services Tax Credit; NRTC = non-refundable tax credit; UGBI = universal guaranteed basic income.
a   The total impacts across all the provinces are the averages of the individual provinces weighted by the appropriate base population.
b   Includes the additional federal and provincial tax revenues due to the removal of the selected NRTCs and the federal GSTC.
c   The cost of the UGBI before the labour supply impacts.
Source: Statistics Canada (2016a). Calculations by the authors.

and the percentage of adults gaining from the conversion of NRTCs to refundable tax credits at the provincial level. Ontario and British Columbia have the lowest guarantees, mainly because of the low benefit reduction rates applied to the guarantee. By comparison, Quebec, Saskatchewan, and Alberta have the highest guarantees both because their benefit reduction rates are among the highest in the country and because of the high value of their NRTCs. This pattern is reflected in the average value of the benefit because Quebec, Saskatchewan, and Alberta feature the highest average benefit per adult, and Ontario and British Columbia provide the lowest. There is a similar pattern to the impact on poverty rates, because the Quebec, Saskatchewan, and Alberta benefits contribute the most to reducing poverty, and the benefits provided in Ontario and British Columbia contribute the least. In contrast, the percentage of families gaining from the UGBI is similar across jurisdictions, as Ontario shows about the same proportion of winners as Alberta and Saskatchewan. Labour supply effects are generally larger where benefits are greater, particularly for adults in low-income families.

Combined Federal and Provincial UGBIs

We are now able to combine the federal and provincial UGBI programs. Table 14 shows the parameters of the combined programs and their impact in terms of the percentage of families who gain, the average benefit, poverty reduction, and labour supply effects. In total, the combined programs have a budget of $82.1 billion, financed almost entirely from the elimination of existing federal and provincial NRTCs and the federal GSTC. Their total cost is marginally (about 1.2 percent) higher at $83.1 billion. Benefit reduction rates reflect the federal rate of 15 percent for our preferred option plus the provincial rates. As we argued in the Labour Supply Response section, an advantage of our preferred option is that the stacking of federal and provincial plans results in combined benefit reduction rates that remain modest in a range from 20 percent for Ontario and British Columbia to 31 percent for Quebec. This is particularly important for UGBI recipients with taxable incomes below the total value of their NRTCs. As we explained in the Design Impacts and Our Preferred Option section, the effective

Table 15: Impact of a Federal and Provincial UGBI on Disposable Family Income by Family Type and Income

After-Tax LICO Level of Family Income	Type of Nuclear Family						Total Families
	Single Parent	Two Parent	Non-Elderly Single	Non-Elderly Couple	Elderly Single	Elderly Couple	
Below LICO	+59.9	+35.4	+66.7	+63.6	+23.8	+62.9	+54.3
1–2 × LICO	+13.4	+2.0	+11.5	+0.6	+4.9	−1.8	+5.7
2–3 × LICO	−0.5	−7.3	+2.4	−7.8	−4.6	−9.2	−4.8
3–4 × LICO	−0.8	−6.8	+2.3	−7.4	−4.3	−9.3	−4.8
≥4 × LICO	−1.3	−3.4	+1.0	−3.9	−1.5	−4.5	−3.0
Total	+8.2	−3.5	+8.0	−4.4	+1.4	−5.3	−0.8

Note. Values are percentages. LICO = low income cutoff; UGBI = universal guaranteed basic income.
Source: Statistics Canada (2016a). Calculations by the authors.

marginal tax rate for these recipients on previously un-taxed income would be double the combined benefit reduction rate.

For six provinces, the percentage of families who gain from the combined program exceeds either the federal or the provincial program taken separately. For Saskatchewan and Alberta, the provincial program is more generous than the national one, resulting in a higher percentage gain from both programs than from just the national program. Nationally, 39.8 percent of families gain from the combined federal–provincial UGBI, which is slightly higher than the results for the national program cited earlier (38.9 percent in Table 8). The average gain in family disposable income is $5,218, which represents 27.8 percent of pre-UGBI disposable income. By comparison, the average loss is $4,178, or 5.6 percent of pre-UGBI disposable income. Quebec, Saskatchewan, and Alberta show the highest average gain, mainly be-cause of their generous provincial UGBI plans, with Newfoundland showing the smallest average gain from its low federal and provincial plans. The loss is lowest for Ontario and British Columbia (4.7 percent) and highest for Quebec (7.6 percent). The average benefit is $4,338, which is slightly higher than the combined federal and provincial average benefits taken separately ($4,274).

The combined federal–provincial UGBI further reduces the rate and depth of poverty and the degree of income inequality. The average poverty rate for all of the prov-inces declines by 56 percent when the federal and pro-vincial programs are combined, compared with only a 40 percent decline for the federal UGBI alone and 24 percent for the provincial UGBIs in isolation. The depth of poverty falls by 32 percent for the combined UGBI, compared with a 17 percent decline for the federal plan and an average 11 percent decline for the provincial UGBIs. The Gini index of income inequality shows a 5.5 percent decline for the combined program compared with a 3.3 percent decline for the federal plan and an average 2.9 percent decline for the provincial UGBIs alone. Labour supply response is also correspondingly

larger, because earnings decline by 10.2 percent for adults in low-income families that benefit the most from the UGBI compared with the 7.2 percent decline for the federal plan and the 3.6 percent decline for the provin-cial programs in isolation. As an indicator of the effi-ciency cost of the UGBI, we view these losses as modest and certainly lower than would arise from the other, more targeted options considered in the Reforming the Federal Tax Credit System section.

Finally, Tables 15 and 16 estimate the combined im-pact of the federal and provincial UGBIs on net family income, poverty, and income inequality by type of family. They can be compared with Tables 9 and 10, respectively, which show the impact of just the national UGBI. Table 15 shows that the disposable incomes of single parents and non-elderly single persons rise the most (8.2 and 8.0 percent, respectively) from the combined UGBI, but the focus of the UGBI is on families with low incomes (below the LICO). These families see their disposable in-comes rise by an average of 54.3 percent, with increases as high as 66.7 percent for non-elderly single individuals, 63.6 percent for non-elderly couples, and 62.9 percent for elderly couples. Because the federal UGBI alone raised disposable incomes by 34.8 percent, as in Table 9, this implies an overall contribution to low-income families of almost 20 percent from the provincial plans. Those with incomes between one and two times the LICO also benefit by an average of 5.7 percent from the combined UGBI benefits, because single parents and non-elderly single individuals realize improvements of 13.4 percent and 11.5 percent, respectively. Those family types with incomes more than twice the LICO generally realize modest losses in disposable income that do not exceed 9.3 percent, although non-elderly single individuals are slightly better off even at these higher income levels.

Table 16 shows that the combined federal and pro-vincial UGBI reduces the rate of poverty by 57 percent, the depth of poverty by 29 percent, and the degree of income inequality by 5.5 percent, although the results are even more dramatic by family type. For single- and

Table 16: Impact of a Federal and Provincial UGBI on Poverty (After-tax LICO) and Inequality by Family Type

Economic Family Type[a]	Rate of Poverty			Depth of Poverty			Degree of Inequality[b]		
	Pre-UGBI (%)	Post-UGBI (%)	Impact (% Change)	Pre-UGBI (%)	Post-UGBI (%)	Impact (% Change)	Pre-UGBI (%)	Post-UGBI (%)	Impact (% Change)
Single parent	16.9	0.0	−100.0	23.3	0.0	−100.0	28.28	21.44	−24.2
Two parent	5.4	0.4	−92.6	25.6	38.7	+51.2	31.03	29.24	−5.8
Non-elderly single	29.6	18.8	−36.5	43.4	24.5	−43.5	40.36	33.93	−15.9
Non-elderly couple	6.1	1.8	−70.5	36.5	24.3	−33.4	35.36	33.87	−4.2
Elderly single	10.3	0.7	−93.2	9.1	6.9	−24.2	28.91	24.20	−16.3
Elderly couple	2.3	0.6	−73.9	35.2	44.7	+27.0	33.30	32.06	−3.7
Total	12.0	5.2	−56.7	34.7	24.8	−28.5	41.30	38.49	−6.8

Note: LICO = low income cutoff; UGBI = universal guaranteed basic income.

a   The LICO measure of low income is based on the economic family unit which includes extended family members living in the same unit.

b   The Gini index is used with the economic family as the unit of measurement.

Source: Statistics Canada (2016a)Q2. Calculations by the authors.

two-parent families, elderly singles, and elderly couples, poverty is essentially eliminated, and the poverty rate is less than 2 percent for non-elderly couples. Only for non-elderly singles does the poverty rate resist virtual eradication, falling from 29.6 percent to 18.8 percent. Still, the depth of poverty for non-elderly singles is reduced considerably from 43.4 percent to 24.5 percent, and income inequality also declines substantially for this group and for other family types with higher pre-UGBI rates of poverty, such as single parents and elderly single persons. Comparison with Table 10 indicates that the prospective provincial component of the UGBI has substantial impact, further reducing the poverty rate to 5.2 percent from 7.2 percent for the federal plan alone, the depth of poverty to 24.8 percent from 28.7 percent, and income inequality to 38.5 percent from 39.9 percent.

Conclusions

The Canadian system of taxes and transfers falls far short of providing universal income security, whether viewed across all families or across different types of families. An important aspect of the problem is the existing set of NRTCs, which provide limited assistance to the low-income families most in need of assistance. This article proposes a UGBI in the form of a refundable tax credit that is financed by eliminating many of the existing NRTCs and the GSTC. On the basis of 2015 tax and transfer parameters, eliminating these credits at the federal level provides a budget of $51 billion that can be spent in a variety of ways. We illustrate four options, involving benefit reduction rates of 15 percent, 35 percent, 50 percent, and 75 percent. We have chosen the 15 percent rate as our preferred option for additional analysis on the basis of its consistency with the existing tax system, its ability to deliver significant poverty reduction and

income redistribution, the estimated labour supply response and implied efficiency cost, prospects for the stacking of provincial benefit reduction rates, and its provision of benefits to a larger segment of Canadian families. This option delivers a family-size adjusted basic benefit or guarantee of $6,657 per year to a single individual with top-ups of $1,500 for persons with a disability and $750 for those caring for infirm dependents. A parallel provincial UGBI funded by elimination of the same set of non-refundable credits with benefit reduction rates set to the lowest provincial tax rates would contribute an additional $33 billion and provide a guarantee in isolation from the federal benefit that ranges from $2,098 in British Columbia to $7,316 in Quebec at tax rates ranging from 5 percent for Ontario to 16 percent for Quebec.

When the federal and provincial components of our proposed UGBI are combined, the impact on disposable income, poverty, and income inequality is dramatic. At a total budget of $83.7 billion, financed by redesign of existing tax credits, the guarantee for a single individual varies from $8,755 in British Columbia to $13,973 in Quebec, and benefit reduction rates vary from 20 percent in Ontario and British Columbia to 31 percent in Quebec. Our estimate of the effect of this UGBI on labour supply is a reduction in earnings of 10.2 percent for adults in low-income families, who benefit the most from the UGBI, and 1.8 percent overall. The after-tax LICO poverty rate is reduced by 57 percent, from 12 percent to 5.2 percent; the after-tax LICO depth of poverty is reduced by 29 percent, from 34.7 percent to 24.8 percent; and the degree of income inequality measured by the Gini index is reduced by 6.8 percent, from 41.3 percent to 38.5 percent. Poverty is eradicated for families with children and elderly persons and only 1.8 percent of non-elderly childless couples experience low incomes. Only single

non-elderly persons continue to be touched by poverty after the introduction of a federal and provincial UGBI, with 19 percent of them still having low incomes.

The decline in earnings from labour supply response results in higher UGBI benefits and lower taxes estimated at $4.64 billion for the federal program and $3.45 billion for the provincial program. Thus, the net cost of the UGBI, beyond the revenue found from the elimination of tax credits, is estimated at $8.09 billion, or 9.7 percent of the total benefits. We would note that these net costs represent modest, but not insignificant, additional effects that we have not explored in this article. We would also note that a UGBI such as the one we have proposed could affect wages, which would in turn also affect earnings and revenue and could invite behavioural response beyond labour supply, such as tax avoidance or evasion, but these issues are outside the scope of this article.

Although others may argue for a different option that involves higher benefit reduction rates, our preferred option scores well against the other options we consider on a variety of criteria, including the number who gain from the UGBI; the simplicity of its integration with the existing tax system; the distribution of net benefits by income level; and the impact on poverty, inequality, and labour supply. After consideration of labour supply response, our federal UGBI option results in the highest percentage who gain (38 percent) and the smallest loss in labour earnings of UGBI beneficiaries in low-income families while achieving rates of poverty and income inequality reduction that are comparable to those of the other plans considered. Also, although another form of financing a UGBI, such as an increase in personal income tax rates, might result in more winners, a more progressive schedule of changes in disposable income, and greater reductions in poverty, it would result in greater work disincentive effects and would encounter political resistance as an increase in taxation. Financing a UGBI through the removal of NRTCs does not lead to higher tax rates on earnings and is virtually cost neutral. The refundable tax credit design of the UGBI makes the tax transfer system more progressive, avoids layering a new grand guaranteed or basic income design over the existing inequities in the tax system, and offers a potentially important step toward truly universal income security for Canadians.

Acknowledgements

Notes

1 A number of changes have been made to NRTCs, including the family tax cut credit, the child tax credits for arts and fitness, and the education and textbook tax credits. In addition, the basic and enhanced UCCB and Canada Child Tax Credit have been replaced by the Canada Child Tax Benefit.
2 We exclude Employment Insurance and Canada Pension Plan benefits because they are funded by employee and employer contributions rather than by general taxation.
3 The incidence of poverty or poverty rate refers to the percentage of families whose income falls below the poverty standard (the after-tax LICO for their family and community size), and the depth of poverty refers to the average percentage by which the income of these families falls below the after-tax LICO.
4 The education tax credits include credits for tuition, textbooks, and interest on student loans.
5 The small difference between the loss in disposable income, which constitutes the budget for the UGBI plans, and the revenue realized from elimination of the NRTCs and the GSTC arises from other features of the federal tax and transfer system affected by the removal of the NRTCs.
6 The new federal government has eliminated the Family Tax Cut Credit as part of its redesign of the child benefit system as an enhanced refundable tax credit.
7 We intentionally adopt the notation of the negative income tax and guaranteed annual income literature, because a refundable tax credit is formally identical in design. Only single tax rates are considered here, but multiple tax rates in a piecewise linear tax schedule could also be considered in more complex formulations of design alternatives.
8 These rates were tested in the Manitoba Basic Annual Experiment, or Mincome (Simpson, Mason, and Godwin 2017), and similar rates were adopted in the US experiments around a negative income tax (Hum and Simpson 1993, S275).
9 If the size of family is n, the guarantee is $\sqrt{n}s$, where s is the guarantee for a single individual, such as $6,657 at $t = 15$ percent in Table 4. A number of closely related and commonly used equivalence scales are discussed in OECD (n.d.). The square root scale is used in recent OECD publications. Such equivalence scales are typically used in discussion of a guaranteed annual income and in social experimentation around a negative income tax, as in Mincome (Hum, Laub, and Powell 1979, 31)
10 The GSTC will be excluded from total family income because in our proposal it is being eliminated and replaced by the UGBI.
11 The top-ups for disability, infirm dependents, and caregivers were set to be slightly more generous than the 2015 value of the tax credits for these situations. The 2015 disability tax credit is worth $1,185 ($7,899 × 0.15), whereas the caregiver tax credit is worth $691 ($4,608 × 0.15).
12 Additional changes will occur in subsequent years as labour supply adjusts to the UGBI, which will result in further changes to the UGBI, but our more detailed results in the following section suggest that these effects will be relatively small.

13 We present more detail on these calculations for our preferred option in the next section.

14 We assume here (and would hope) that provinces do not recoup UGBI benefits from those receiving social assistance or provincial disability benefits, as is their practice with respect to the Canada Child Benefit. Issues associated with the integration of the UGBI with current social assistance programs are beyond the scope of this article.

15 The cost of the program marginally exceeds revenues for Newfoundland, Ontario, Manitoba, Saskatchewan, Alberta, and British Columbia, whereas revenues exceed cost for Nova Scotia, New Brunswick, and Quebec. These small discrepancies between disposable income and tax revenue arise from other features of the provincial tax and transfer systems that are affected by the removal of the NRTCs.

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Appendix

Methodology for Estimating Labour Supply Response

Introduction of a Refundable Tax Credit (RTC) financed in whole or in part by the removal of non-refundable tax credits is expected to reduce earnings for two reasons. First, there will be a reduction in hours worked h and participation π arising from the increase in the effective tax rate, which reduces the after-tax wage w. Second, there is a reduction in hours worked from the increase in income y when RTC benefits exceed the tax increase arising from the elimination of the NRTCs. Conversely, there is an increase in hours worked for those who experience a net loss in income when the tax increase exceeds the RTC.

Total hours worked H in the population will be a product of the proportion participating π and the average hours worked h of those who participate. That is, in log terms,

$$\ln H = \ln \pi + \ln h \qquad (A.1)$$

so that the proportional change in total hours worked is

$$d \ln H = d \ln \pi + d \ln h, \qquad (A.2)$$

where $d \ln \pi$ and $d \ln h$ represent the proportional changes at the extensive and intensive margins, respectively. At the intensive margin for those with positive hours, we have

$$d \ln h = \eta_w d \ln w + \eta_y d \ln y, \quad h > 0, \qquad (A.3)$$

where η_w and η_y are the respective substitution and income elasticities with respect to hours worked for those working at the intensive margin (e.g., Hum and Simpson 1993, S272). At the extensive margin, there will be a participation effect for those working of the form

$$d \ln \pi = \eta_p d \ln w, \quad h > 0, \qquad (A.4)$$

where η_p is the participation elasticity from a change in after-tax wages. Combining Equation (A.2) with Equations (A3) and (A4) and writing the labour supply response in terms of population earnings $E=wH$ gives

$$d \ln H \approx \frac{w \Delta H}{wH} = \frac{\Delta E}{E} = \eta_w \frac{\Delta E}{E} + \eta_y \frac{\Delta y}{y} + \eta_p \frac{\Delta E}{E}, \quad (A.5)$$

The proposed UGBI produces a change in income Δy, consisting of an increase in the income guarantee and a reduction in earnings at the intensive and extensive margins from the change in the after-tax wage Δw, measured at hours worked before the conversion. If initial earnings and income are E and y_1, respectively, and the personal income tax rate (PIT) is t_1 before introduction of the UGBI and t_2 after, then the UGBI introduces a benefit reduction rate (BRR) $r = 0.15$ for anyone receiving the benefit. Moreover, individuals whose income is below the value N of their non-refundable tax credits, which are eliminated under the proposed UGBI, would have previously paid no PIT ($t_1=0$) but would now pay PIT at the lowest federal rate ($t_2=0.15$) on the UGBI benefits received, which alters income to y_2. Then the substitution effect for an assigned (positive) substitution elasticity η_w would be

$$\Delta E_s = \eta_w \Delta E, \quad \Delta E = [(1 - t_2 - r) - (1 - t_1)]$$

$$E = -(t_2 - t_1 + r)E = \begin{pmatrix} -(t_2 + r)E \text{ if } y_1 < N \\ -rE \text{ if } y_1 \geq N \end{pmatrix}, \qquad (A.6)$$

which will be negative for individuals with positive hours worked and earnings and zero otherwise. Similarly, at the extensive margin the participation effect for an assigned (positive) participation elasticity η_p would be

$$\Delta E_p = \eta_p \Delta E, \quad \Delta E = \begin{pmatrix} -(t_2 + r)E \text{ if } y_1 < N \\ -rE \text{ if } y_1 \geq N \end{pmatrix}, \quad (A.7)$$

which will also be negative for individuals with positive hours worked and earnings and zero otherwise.

That is, for individuals with earnings, the substitution effect will be $\Delta E_s = -0.3E$ and the participation effect will be $\Delta E_p = -0.3E$ for those whose initial income is below the value of their non-refundable credits because they previously paid no taxes but would now face both the BRR on the UGBI and the PIT on benefits received. For those with earnings whose initial income is at or above the value of their non-refundable credits and previously paid PIT, the substitution effect will be $\Delta E_s = -0.15E$ and the participation effect will be $\Delta E_p = -0.15E$ because these individuals now face the BRR on UGBI benefits in addition to the PIT.

For an assigned (negative) income elasticity η_R the income effect for each individual is given by

$$\Delta E_y = \eta_y \frac{E_1}{y_1} \Delta_y, \qquad \Delta y = y_2 - y_1, \qquad (A.8)$$

which will be negative for anyone who benefits from the conversion (i.e., where $y_2 > y_1$) and positive otherwise. This gives us a total (negative) individual labour supply response of

$$\Delta E = \Delta E_s + \Delta E_y + \Delta E_p, \qquad (A.9)$$

which we add across individuals to obtain the aggregate labour supply response in terms of lost earnings.