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Designing a Basic Income Guarantee for Canada

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Abstract

We propose mechanism for implementing a two-stage harmonized Basic Income Guarantee with federal and provincial components. In Stage One, the federal government replaces its refundable and nonrefundable tax credits with an income-tested basic income delivered through the income tax system. The reform is revenue-neutral. In Stage Two, each province decides whether to implement a provincial basic income guarantee that is harmonized with the federal one but allows province-specific basic income levels. The provincial basic income replaces provincial refundable and nonrefundable tax credits as well as welfare and disability transfers, and is also revenue-neutral. All social services and contributory social insurance programs remain intact. An illustrative calculation using Statistical Canada's SPSD/M model shows the financial feasibility of a national BIG of \$20,000 per adult adjusted for family size with a benefit reduction rate of 30%.

Key Words: basic income guarantee, inequality, fiscal federalism

JEL Classification: H2, H7 I3

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1. Introduction

There is renewed interest in the idea of a basic income guarantee for Canada. This is partly driven by growing inequality and the inability of redistribution policies to address it (Fortin et al, 2012; Banting and Myles, 2013). At the lowest income levels where much of the population relies on provincial welfare assistance, incomes have fallen dramatically in the past three decades. In Ontario, the welfare income of a single employable person fell from \$12,500 in 1994 to \$8,500 in 2014 measured in 2004 dollars (Tweddle, Battle and Torjman, 2015). Compounding this is the increase in earnings volatility resulting from the stagnation of full-time jobs and the precariousness of employment as technology displaces factory jobs and the forces of globalization result in a race to the bottom among both employers and governments. Moreover, there is increasing evidence of the self-reinforcing nature of poverty. Poverty leads to poor nutrition and health outcomes, impedes educational attainment, and prevents poor persons from participating in society and from improving opportunities for themselves and their families. Putting more money in the hands of the poor will increase their well-being and life chances, and make them less dependent.

The basic income guarantee (BIG) that we propose in this paper is motivated by these considerations. As well as being an altruistic impulse, it is an investment in the betterment of persons and their children who are unable to achieve their potential. However, a BIG is not in itself a panacea. The income security it provides is necessary but not sufficient for addressing the needs of the disadvantaged. It complements other public programs such as employment creation, housing, education and healthcare. Our focus will be on reform of government transfer programs, leaving intact in-kind benefits, social services and regulations (e.g., minimum wage). The BIG we propose would be revenue-neutral reform in the composition of government transfers to persons that would significantly improve the relative position of those in the bottom of the net income distribution and reduce poverty. It would replace most existing transfers delivered through the tax system, including many non-refundable and refundable tax credits. Social insurance programs such as employment insurance (EI), workers' compensation and Canada and Quebec Pension Plans (CPP/QPP) would remain. Our analysis combines adequacy and comprehensiveness of income support with dismantling the burdensome administrative costs and

intrusive delivery of provincial social assistance programs. Social services would remain intact, and more wide-ranging reforms could address the administrative costs of delivering them.

Arguments for a BIG are not new to Canada. A form of BIG was proposed by the Special Senate Committee on Poverty (1971) and the Royal Commission on Canada's Economic Prospects (1985). A vocal proponent has been Segal (2008, 2009). Alternate BIG proposals have been studied empirically by Hum and Simpson (2005), Young and Mulvale (2009), Simpson and Stevens (2015) and Lammam and MacIntyre (2015). These studies differ in terms of the changes in the existing tax-transfer system they propose and the income guarantee level. For example, the Lammam-MacIntyre study treated BIG as a replacement for all programs aimed at serving the needs of low-income persons, including EI, CPP/QPP, and social services, to investigate the administrative cost savings associated with delivering all existing programs for the poor through a single transfer system without enhancing their benefits. This form of BIG resembles a negative income tax system along the lines originally proposed by Milton Friedman, and would not address the shortcomings of existing programs in alleviating poverty and income volatility. Recent summaries of the pros and cons of a BIG may be found in Himelfarb and Hennessy (2016) and Macdonald (2016), and suggestions for the design of a basic income pilot are found in Forget, Marando, Surman and Urban (2016) and Segal (2016).

In approaching the design of a BIG for Canada, two broad issues must be addressed. The first is whether the BIG should be a universal basic income paid to all persons regardless of means or a more targeted BIG meant to ensure that no one falls below the income guarantee. European proponents of basic income opt for the universal version both on philosophical grounds—basic income as a right to which all are entitled—and on grounds of political feasibility—the fostering of political support when all voters are entitled to basic income (Van Parijs, 1995). Atkinson (2015) has instead argued that to buy political support, basic income recipients should be required to make some social contribution, such as employment, education, training or job search, care-giving or voluntary work. This idea, referred to as participation income, risks perpetuating the administrative costs and stigmatization of existing systems.

The argument against the universal approach is its cost. If all persons are given, say, \$20,000 per year, it would cost \$20,000 per person on average. Since many persons are not taxpayers, the cost per taxpayer would be correspondingly greater. This would be diminished considerably if basic income were taxable, but even then everyone would receive some amount.

If the top marginal tax rate were 50%, the highest income earners would receive \$10,000 after tax. This negative income system would reduce the cost of a universal basic income, but it would still be expensive and would entail considerable ‘churning’ of tax revenues (tax revenues being raised to make transfers to the persons who paid the taxes).

The alternative to a universal basic income is to emphasize the guarantee of a basic income as its defining feature. According to this view, the design of a BIG should be based on finding the most efficient way of ensuring that no one’s income falls below the chosen basic income level, taking work incentives into account. An income-tested BIG is a suitable form and could be administered most simply through the income tax system, either as a refundable tax credit like the Canada Child Benefit (CCB), the Working Income Tax Benefit (WITB) and the GST/HST Credit, or as a standalone transfer like the Old Age Security and Guaranteed Income Supplement (OAS/GIS) system. The income-tested transfer would be superimposed on the progressive income tax structure, but could have tax-back rates that differ from the latter as is the case with these refundable tax credits and standalone transfer programs. They have tax-back rates that ensure that the transfer is phased out before high incomes are achieved. A BIG program would ideally incorporate all such transfers into a single system with a given basic income level and tax-back rates based on individual or family income as desired. For taxpayers who receive BIG, the implicit marginal tax rate includes both the income tax rate and the BIG tax-back rate.¹

The second broad issue to confront is that the federal government, provinces, territories and First Nations all assume some responsibility for transfers to low-income persons. The federal government dominates transfers to the elderly through OAS/GIS and to children through CCB, while the provinces and territories make major transfers to the long-term unemployed and the disabled through their welfare systems. Both levels of government implement income-based refundable and non-refundable tax credits (RTCs, NRTCs). The federal government has fiduciary responsibility for First Nations, and finances welfare systems that they deliver. Transfers vary considerably among provinces and First Nations, and some groups, such as low-income workers, receive relatively little support from any level of government. The result of this patchwork system is uneven, where the elderly and low-income families with children fare better than those relying on provincial transfers, and low-income workers receive limited support.

A BIG that supplants the existing system of transfers must take account of the interest that both levels of government have in redistribution, as well as the special responsibility that the federal government has for First Nations. This complicates the form of an ideal BIG system, as well as the movement from the existing system to a BIG, especially given that the existing system falls far short of adequate levels of income support.

The challenge we address is how to design a BIG in Canada's federal setting that provides adequate levels of support with a minimum of stigmatization and conditionality, with a suitable balance between program cost and work incentives, and with a degree of differentiation across provinces that accommodates provincial preferences without detracting from national objectives. Our scheme involves a two-stage transition from the current system of transfers, with the federal government implementing a federal BIG in the first stage and the provinces having the opportunity to implement a harmonized provincial BIG in the second stage. The analogue that informs our proposed scheme is the federal-provincial tax harmonization system that exists in similar forms for personal and corporate income taxes and the GST/HST. These are bilateral agreements between the federal government and individual provinces, so unanimous agreement is not required. Like the tax collection agreements, the design of a two-stage program must make it inviting for the provinces to join in and must pay attention to the implications of a federal-provincial BIG system for intergovernmental fiscal arrangements, such as the division of tax room, Equalization and the Canada Social Transfer.

Our scheme focuses on a BIG delivered by the federal government and the provinces. We omit the territories for simplicity, since they raise no special issue of substance. Providing a BIG to First Nations members poses special challenges, especially if it is administered through the income tax system. An acceptable BIG would involve the participation of First Nation governments even if the financing comes largely from the federal government. This would entail institutional issues that call for a separate study.

Our proposal involves replacing all RTCs and NRTCs with an income-tested BIG consisting of federal and provincial components. For computational simplicity, OAS/GIS are also replaced, though that is not essential, while the CCB is retained as a BIG for children. Keeping OAS/GIS and some NRTCs could be accommodated without affecting the broad features of the reform. The system is virtually self-financing, or revenue-neutral, in the sense that the cost of the federal BIG roughly equals the value of federal RTCs and NRTCs, and the same

for the provinces. No tax rate increases are required. The size of the national BIG is \$20,000 per adult adjusted for family size and with a claw-back rate of 30% based on family net income. The federal BIG is \$14,322, while the average provincial BIG is \$5,678, although with allowable variations across provinces. Financial feasibility is confirmed by simulations using Statistics Canada's SPSD/M model, augmented by conjectures about labour supply responses.

Replacing federal and provincial tax credits with a BIG delivers an impressive amount of redistribution of disposable income from those in the top half of the net family income distribution to those in the bottom half. As Table 2 indicates, the fall is roughly 10% and relatively uniform for the former, while those in the bottom two deciles gain by 167% and 74%, respectively. The gain for low-income single adults is almost 270%, albeit from a low pre-reform level. Table 4 shows that disposable income inequality is significantly reduced with the Gini coefficient falling by almost 17% and the poverty rate falling by 73% to only 3.2%. Estimated labour supply responses reported in Table 5 are negative for the bottom six deciles and positive for the top four. Overall, earnings fall by about 2.2%, causing the cost of the BIG program to rise by less than 3%, not enough to compromise revenue-neutrality.

The details of how these outcomes are achieved by simply reallocating existing tax credits and transfers are recounted below. First, we provide a brief review of the arguments for an income-tested BIG and summarize the relevant features of the existing Canadian tax-transfer system.

2. The Case for an Income-Tested BIG

Why should society guarantee a basic income unconditionally to all individuals regardless of their behaviour? Two classes of arguments can be made. The first draws on normative welfare economics and social choice theory, especially as it has been applied in optimal redistribution analysis. These tend to be relatively technical arguments. The second class consists of a number of policy-based considerations.

Standard optimal redistribution theory posits a benevolent government maximizing a social welfare function that aggregates the well-being or 'utility' of all persons. In the absence of redistribution, persons with greater skills or productivity—because they are so endowed or because they have acquired skills through education and socio-economic surroundings—will be better off (i.e., attain higher utilities). As long as the social welfare function exhibits aversion to

utility inequality, partly because individual marginal utilities of income are decreasing,² redistribution will be from the better-off to the worse-off. Typically, this will require the least well-off receiving a transfer. In the extreme case where aversion to inequality is the highest, the social welfare function will be of the maxi-min sort (Rawls, 1971), so the welfare of the least well-off will be maximized.³

The social welfare approach supports redistribution to the less well-off, but does not lead one directly to a basic income guarantee. That is because income does not index individual utility or welfare. The latter includes, for example, leisure time. In the classical optimal income tax problem, utility is increasing in income, but if the objective of the Rawlsian government were to maximize the income of the least well-off, that would not be the same as maximizing the welfare of the least well-off because the value of leisure—or the cost of work—would not be given any weight (Kanbur, Keen and Tuomala, 1994). However, recent contributions to redistribution theory have questioned the relevance of the standard social-welfare-maximizing approach, and lend more direct support to a BIG.

The first contribution may be found in the equality of opportunity literature and is motivated by the fact that individuals have different preferences. Faced with identical circumstances, individuals may make quite different choices. They may differ in their saving behaviour or in their propensity to take risks, for example. For our purposes, they may differ in their preferences for leisure. Those who choose to work hard will have higher incomes at the expense of leisure than others. In these circumstances, incomes may no longer be perfectly correlated with well-being. Indeed, ranking persons by well-being is less clear-cut when preferences for leisure differ. The equality of opportunity approach attempts to resolve this issue by supposing that persons are to some extent responsible for their preferences, and differences in outcomes across persons arising because of differences in preferences should neither be penalized nor rewarded: the Principle of Responsibility. Persons should only be compensated for differences over which they have no control, such as their skills: the Principle of Compensation. It turns out that these two principles are in conflict and cannot both be satisfied, though we need not dwell on the reasons here. For our purposes, the point is that giving persons of identical skills equal opportunities or resources preserves the Principle of Responsibility. In practical terms, this suggests that in redistributing to the least skilled or productive, the amount of the transfer should

not be contingent on how much the recipients choose to work. This would support an unconditional BIG program.

This argument has been taken further by Fleurbaey and Maniquet (2011). They also begin with the Principles of Responsibility and Compensation, but they suppose following the social choice literature (Arrow, 1951) that welfare can neither be measured nor compared across persons. Since the two principles cannot be satisfied at the same time, they propose variants that compromise one or the other principle. In one variant, the Principle of Compensation is assumed to be satisfied, while the Principle of Responsibility is weakened. Given the immeasurability of utility, they propose that the Principle of Compensation can be captured in a form of the Pigou-Dalton transfer principle: social outcomes are assumed to be improved if consumption differences are reduced between persons of different skills and the same preferences who supply the same amount of labour. The Restricted Principle of Responsibility requires that if persons differed only in preferences, the laissez-faire would be optimal. Using these two requirements combined with the Pareto principle, they show that the social ordering takes the maxi-min form in an index of utility based on resources required to get to each individual's indifference level.⁴ All others persons, including less industrious persons with the lowest skills, achieve a higher utility index. This can be interpreted as a form of BIG, where the income guarantee is a virtual laissez-faire budget line.

These arguments for defining social orderings in terms of a measure of resources required to achieve existing levels of welfare (or indifference curves) is reminiscent of arguments for indexing individual well-being for tax purposes using comprehensive income (Haig-Simons-Musgrave). Comprehensive income was taken to be a measure of the ability to pay taxes, and the Carter Report recommended it as the income tax base. The case for a progressive rate structure was based partly on the doctrine of equal sacrifice (e.g. all individuals should be made equally worse off as a result of taxation, either proportionately or in absolute terms), and partly on the idea that a minimum amount of income was needed for non-discretionary spending so should be tax-favoured. Discretionary spending could be taxed at a higher rate (up to 50% according to Carter). The Carter Report was preoccupied by income taxes rather than transfers so did not broach the topic of a BIG. However, the notion of minimum amount of individual spending being non-discretionary or necessary leads one immediately to the presumption that all individuals ought to receive at least the minimum necessary amount.

Compelling arguments for a universal BIG can be made on the basis of citizenship or human rights. Article 25(1) of the Universal Declaration of Human Rights proclaimed by the U.N. General Assembly in 1948 and signed by Canada states “Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care and necessary social services, and the right to security in the event of unemployment, sickness, disability, widowhood, old age or other lack of livelihood in circumstances beyond his control.” This can be interpreted as the right to a basic income.

Normative arguments reinforce that right. The enviable level of per capita output of goods and services produced by the Canadian economy is due in part to the skills, hard work and ingenuity of Canadian workers and entrepreneurs. However, that success is contingent on the quality of Canadian institutions, the sanctity of the legal system and the rule of law, the accumulated knowledge that current generations have inherited from the past and natural endowments of resources and amenities, all of which are part of the common heritage of all citizens. Those who earn large wages and salaries do so partly from their own effort, but partly from luck associated with living in the right place at the right time. Providing less fortunate persons with a BIG recognizes their share of the bounty that Canadian prosperity allows.

A BIG can also be partly justified as an investment in human development. Higher incomes contribute to better nutrition, better health outcomes and better education, both for income recipients and for their children. Evidence from the 1974–79 Mincome guaranteed annual income experiment in Dauphin, Manitoba summarized by Forget (2011) confirms this. A BIG also gives persons the capability of participating fully in society and the human dignity that entails (Sen, 1985). Removing the anxiety about where the next meal or adequate clothing and housing will come from allows individuals to focus on longer term decisions. And, removing the stigmatization of the existing system can actually contribute to building social norms such that transfer recipients feel good about themselves and their potential to contribute to society, and therefore have more incentive to work, provided there is some minimum reward for doing so.

These arguments have already been accepted for a segment of the population, specifically the elderly and low-income families with children. We investigate below how they might be extended to the entire population.

3. Basic Elements of Canada's Tax-Transfer System

Our national BIG would include both federal and provincial components, and would replace the various transfer programs now provided by the two levels of government. Like the latter, a national BIG with federal and provincial components would rely on the income tax system, and is inspired by the Canadian tax harmonization system. It aims to achieve a similar form of harmonization as exists in the tax system. We begin by summarizing the current federal and provincial transfer systems and then turn to tax harmonization.

3.1 Federal and Provincial Income Transfers

Diverse forms of income support are provided by governments in Canada to different types of residents. Virtually all low-income persons receive some support. However, levels of support are uneven and inadequate, and often poorly targeted. Some of the current income support programs are administratively complex and intrusive, and discourage some persons from escaping poverty.

Federal government transfers to low-income persons take two main forms. Persons aged 65 and over are eligible for OAS and GIS depending on their income. In 2016, the basic OAS is \$6,846 per year, is indexed and is taxable. Once annual net income reaches \$71,592, OAS is subject to a recovery tax of 15% so it falls to zero at an income of \$116,103. In addition to OAS, GIS is available to the lowest-income seniors and is non-taxable. The maximum annual amount is \$9,283, and it falls to zero at \$17,304 (which reflects a tax-back rate of about 50%). Taken together, OAS and GIS offer a maximum annual amount of \$16,129. They operate outside the income tax system but are integrated with it.

The other federal low-income transfers are three income-tested RTCs, which are integral to the tax system and administered by the CRA. One is the CCB, which began in 2016. It is a tax-free payment to families based on the number and age of children, and is family-income tested. It can be supplemented by a child disability benefit as well as provincial or territorial benefits. In 2016–17 (since monthly payments are recalculated each July), the annual amount was \$6,400 for each child up to age 5 and \$5,400 per child aged 6 to 17. CCB is reduced when family net income exceeds \$30,000 and the tax-back rate varies with the number of children. With one child, the tax-back rate is 7% for family incomes between \$30,000 and \$65,000, and 3.2% above that, and corresponding tax-back rates are 13.5% and 5.7% for two children, 19% and 8% for three children, and 23% and 9.5% for four or more children. For families with one

child, the CCB falls to zero only when family incomes reach over \$120,000, and similarly for more than one child.

The WITB is a modest RTC given to low-income workers aged 19 and above, and encourages labour force participation. It can include a disability supplement, and can vary by provinces. For single persons in most provinces, the annual WITB for 2015 is \$1,015 if working income is between \$7,060 and \$11,525. It is reduced when income exceeds \$11,525 and falls to zero at \$18,292. The maximum amount for families is \$1,844 if family working income is between \$10,376 and \$15,915. It falls to zero when family working income reaches \$28,209. The maximum WITB disability supplement is \$508.

The GST credit compensates low-income persons for GST paid on their consumption purchases. For provinces who have harmonized their sales taxes, an HST credit applies that varies by province. The GST credit varies by family size and family net income, and is indexed annually for inflation. For a single person with no children the maximum amount is \$421 per year on incomes starting at \$20,000, and falls to zero at \$46,000. (The credit is less than \$421 if income is less than \$20,000.) With two children, the maximum GST credit is \$842 starting at zero income and falls to zero at \$54,000. Amounts are slightly higher with two adults and more children. As can be seen, the GST credit is modest in size.

Since these refundable tax credits are administered by CRA as part of the income tax system, individuals must file an income tax return to be eligible. Amounts are based on the previous year's income, and so cannot take account of changes in family income in the meantime. The provinces also offer some refundable tax credits, but like the GST credit these are relatively small.

Provincial transfers consist mainly of welfare payments to the long-term unemployed and transfers to the disabled. The amounts vary widely across provinces as documented by Tweddle, Battle and Torjman (2015). In 2014, welfare for single employable persons was \$11,035 in Newfoundland & Labrador, and varied in other provinces from \$6,811 in New Brunswick to \$8,995 in Saskatchewan. For two-parent, two-child families, the highest amount was \$27,240 in Prince Edward Island, and elsewhere was between \$21,770 in New Brunswick to \$25,886 in Ontario. Single disabled persons received \$14,094 in Ontario, and between \$9,425 in New Brunswick and \$12,375 in Quebec. These amounts are not indexed for inflation, and have been trending downwards in real terms since the early 1990s.

Unlike RTCs and OAS/GIS, provincial welfare and disability transfers are delivered by provincial social assistance administrators. Whereas federal programs are based on self-assessment (apart from disability supplements, which requires a doctor's approval), eligibility for welfare and disability involves application for support, screening for eligibility and some ongoing monitoring. Recipients are restricted in the value of assets they can own, and their ability to earn income is severely restricted and subject to varying tax-back rates, typically quite high. Welfare recipients are expected to be available to work and to accept job offers. Eligibility for welfare and disability also entails eligibility for various social services, such as housing assistance, pharmaceuticals, public transit subsidies and counselling.⁵ The consequence is a system that can be stigmatizing, and that discourages work and saving.

Both the federal and provincial government offer a number of NRTCs. These vary by taxpayer characteristics and are income-tested. Since they are non-refundable they are of limited value to low-income individuals.

Government transfers are typically not well targeted to those most in need, and many are not indexed. Some are delivered in ways that are stigmatizing and do not encourage labor market participation or work effort. Transfer recipients tend to fall into separate categories of persons who rely mostly on federal support—such as the elderly, the working poor, the temporary unemployed and children—and those who rely on provincial support—the long-term unemployed and the disabled.

The inadequacy of the level of support for low-income persons can be judged by comparison with poverty measures. The Low-Income Cut-Off (LICO) compiled by Statistics Canada (2016) is a useful benchmark. It measures the income level at which a family of a given size spends 20 percentage points more than the average family (of the same size) on food, clothing and shelter. LICOs vary by size of family and populations of place of residence. In 2011, the LICO for a single person was \$14,454 in towns with less than 30,000 inhabitants, \$16,328 in cities between 100,000 and 500,000, and \$19,307 in cities above 500,000. For two-person families, the corresponding figures were \$17,592 in towns with less than 30,000, \$19,872 in cities 100,000 to 500,000, and \$23,492 in cities above 500,000. For four-person families, it was \$27,329 in towns less than 30,000, \$30,871 in cities 100,000 to 500,000, and \$36,504 in cities above 500,000. Only seniors receiving OAS/GIS come close to LICO amounts, and then only for small municipalities.

Moving to a national BIG involves replacing existing transfer programs them with a uniform system, and coordinating federal and provincial programs so that a harmonized BIG is achieved with some provincial discretion. The existing refundable tax credits and the OAS/GIS system are proven models for delivering an income-tested transfer that could be exploited in a BIG program. Both of these systems take advantage of the income tax collection machinery administered by the CRA. The self-reporting feature combined with the anonymous administration minimizes onerous application, conditionality and stigmatization associated with transfer systems like welfare, disability and EI. The design flaws of existing transfers administered through the income tax system could be readily overcome, although it would entail gainers and losers.

3.2 The Federal-Provincial Tax Harmonization System

Our national BIG proposal is inspired by tax harmonization arrangements that apply to the personal and corporate income tax systems as well as to sales taxes. In each case, tax harmonization is based on bilateral federal-provincial agreements that follow a common template. For the personal income tax, agreeing provinces—which include all except Quebec—sign a Tax Collection Agreement (TCA) that obliges them to accept the federal tax base while allowing them discretion over their provincial rate structures and non-refundable tax credits. Taxes are administered by the CRA and are allocated to provinces according to the taxpayer's province of residence on December 31 of the taxation year. The federal government turns over tax revenues owing to the provinces in as timely a manner as possible, and is responsible for unpaid taxes.

The TCAs for the corporate tax—which apply to all provinces except Alberta and Quebec—operate in a similar way. Provinces use the federal tax base but choose their own general and small business tax rates and have some discretion over the choice of tax credits. Where corporations operate in more than one province, the tax base is allocated among provinces for tax purposes by an allocation formula that gives equal weight to shares of revenues and payrolls in each province.

Sales tax harmonization is more complicated because of the value-added nature of the GST. Provinces that harmonize their sales taxes with the GST (the Atlantic Provinces plus Ontario) must replace their retail sales taxes with the harmonized sales tax (HST). The HST rate consists of the federal rate of 5% plus the rate chosen by each province. Registered sellers in

each province apply the relevant HST rate where the sale takes place, and firms that purchase taxed goods can claim an input tax credit. The CRA administers the system, but does not keep track of the amount of tax owing to each province. Instead, the allocation of HST revenues across provinces is based on estimates of aggregate consumption in each province. Although Quebec does not participate in the HST, the Quebec sales tax (QST) is also harmonized with the GST. The Quebec revenue agency administers both the QST and the GST collected in the province, and turns over revenue from the latter to the federal government. The absence of border controls makes the QST slightly more difficult to administer for cross-border transactions, which could have consequences for tax compliance.

The TCAs illustrate how the federal government can pursue a harmonization initiative that the provincial governments can choose to join. Provincial choices involve a perception that there are net benefits of joining. In the case of tax harmonization, these benefits include the collection and compliance benefits of a harmonized system with a single tax-collecting authority combined with the discretion to set their own tax rates. Those who choose not to join perceive some benefit from retaining control over their tax bases despite having to collect their own taxes. Harmonization with the GST is a more substantial reform since it requires a significant change in the tax base, including broadening the base to include goods and services that are not taxed under provincial retail sales taxes.

The TCAs are not without problem. Some provinces have expressed concern over the accuracy of initial reimbursements to the provinces, given that final reconciliation of taxes collected on their behalf occurs more than a year after the end of the tax year. There are also concerns with the allocation formula. Corporations are able to manipulate it to some extent through the use of affiliates in different provinces, given that they do not have to report consolidated accounts for tax purposes. Provinces might worry that not enough attention is paid to ensuring compliance with the allocation formula since there is nothing at stake for the federal government. Despite these problems and limitations that the agreements have for provincial policy discretion, no province has left the TCAs and in recent years Ontario has signed a corporate TCA. Provinces have gradually been adopting an HST, although in British Columbia that intention was overturned by a fractious referendum.

From the perspective of a national BIG, the tax harmonization agreements show the feasibility of the federal government achieving harmonization voluntarily with the provinces in a

situation in which both levels of government have legislative jurisdiction and interests in the policy issue. The feasibility of a BIG harmonization agreement is not an issue given that transfers administered through the income tax system face similar compliance issues as the income tax itself. Implementation is an issue of political will. For a harmonization scheme to work, the federal government must assume the role of initiator with the expectation that provinces who join would agree to accept some basic structure of a BIG in return for having some discretion over a provincial component.

Federal-provincial tax harmonization is part of a broader system of fiscal arrangements that have a bearing on the kind of fiscal reforms we are contemplating. The relevant elements for our purposes are federal-provincial transfers. One of these is Equalization which makes unconditional transfers to provinces with revenue capacity below the national average to bring them up to the national average. This system would remain intact with our reforms. In addition, the Canada Health Transfer (CHT) and Canada Social Transfer (CST) are equal per capita transfers nominally in support of provincial health, social assistance and services, and post-secondary education. They have mild conditions attached to them, but are otherwise available for the provinces to use at their discretion. An important purpose of the transfer system is to maintain balance in the federation, both horizontally and vertically. The CST in particular is intended to assist the provinces in financing social assistance, and to the extent that social assistance will be replaced by a BIG, the size of the CST would need to be revisited.

Given these considerations, we propose a feasible two-stage process for implementing a national BIG program that could potentially address the deficiencies of the existing transfer programs and harmonize federal and provincial transfers.

4. A Two-Stage Basic Income Guarantee Proposal

Our national BIG encompasses federal and provincial components, with each retaining some discretion over program size in a harmonized framework. The proposal involves two stages. Stage One involves federal reform of its transfers to a federal BIG, taking as given existing provincial policies. Stage Two explores individual provincial BIG choices analogous to negotiating tax harmonization agreements with the federal government. This latter stage could involve many alternative templates involving the nature of provincial discretion and the rebalancing of federal-provincial fiscal arrangements. Our proposal will be somewhat general,

leaving full details to be worked out later, although we mention many aspects that would need to be considered.

4.1 Stage One: A Federal BIG

The first stage is contingent on the preferred parameters of a national BIG, including a BIG level and a tax-back schedule. The BIG level could, like the LICO, vary by family composition and size of community, and by personal circumstances, such as disability. To keep matters simple, suppose that a common annual level is chosen, say, \$20,000 per single adult, and \$6,000 per child. The adult BIG is adjusted to take account of family size using standard family equivalence scales. Following OECD (2008) and Statistics Canada (2016), we adopt the square-root scale: a two-adult family receives \$20,000 times $\sqrt{2}$, a three-adult family \$20,000 times $\sqrt{3}$, and so on, in addition to what they receive on behalf of children. (As discussed below, the CCB serves as the BIG for children, with no family size adjustment.) These amounts represent the benchmark national BIG. In Stage One, the federal government chooses BIG levels less than the national benchmark, given that when provinces agree to join they will implement provincial supplements.

The tax-back schedule could be uniform or piecewise linear and could vary by income. For simplicity, we use a constant tax-back rate, 30% in our numerical example. The tax-back rate applies to family net income, comparable to many existing tax credits. The choice of a tax-back rate affects the income level at which the BIG disappears as well as labour market participation and work effort incentives. To promote labour force participation, the tax-back rate could be zero for some initial income range and positive thereafter, as in one option proposed by Simpson and Stevens (2015).

Stage One is based on the principle that all individuals are brought up to at least the federal BIG level taking into account provincial welfare and disability transfers. (Provincial RTCs and NRTC's will be used to finance the provincial BIG component.) Welfare and disability recipients receive the federal BIG less an amount reflecting these provincial transfers, while the federal BIG applies to all others. There are four main issues with implementing this.

1. The first is how to deal with the fact that provinces offer different levels of support. Simply topping up provincial welfare and disability transfers to the federal BIG level would be problematic. It would give provinces an incentive to reduce their transfer rates, and, by undoing differences in provincial rates, nullify provincial preferences. To mitigate the incentive problem and preserve provincial discretion, national

average provincial transfer rates would be calculated for welfare and disability assistance. The calculation could be done for the different categories of recipients by family type and would be weighted by the number of recipients in each province. The BIG transfer to persons in each category would be the basic federal BIG less the relevant national average provincial welfare or disability transfer. Welfare or disability recipients in any given category would receive the same federal BIG top-up but different overall amounts in different provinces. Basing the federal BIG on national average provincial transfer rates mitigates the incentive the provinces would otherwise have to reduce their transfers in expectation of the federal top-up making up the difference. All other persons would receive the full federal BIG. The BIG transfer would be taxed-back based on net income as defined for tax purposes, which includes taxable transfers like EI and CPP/QPP. However, it would exclude provincial social assistance transfers, so would differ from the base used for the income tax schedule. The effective marginal tax rates would be the sum of the tax-back rate and the marginal income tax rate. Note that provinces also apply varying tax-back rates to employment income earned by welfare and disability recipients. Since the BIG tax-back rate excludes provincial welfare and disability transfers, the BIG tax-back rate and the provincial welfare/disability tax back rates are not both applied to the same earnings.

2. The second is how to finance the federal BIG. This would largely be done by eliminating existing federal transfers, including OAS/GIS, RTCs like the CCB, the GST Credit and WITB, and most NRTCs, with the possible exception of those intended to achieve non-redistributive objectives like credits for charitable donations and political contributions. Only federal tax credits would be eliminated in Stage One since no unilateral changes are made to provincial fiscal programs. Shortfalls in financing would have to be made up from other revenue sources. Eliminating OAS/GIS and the CCB when the federal BIG is introduced might be controversial and perhaps not necessary. Some elderly persons could be made worse off by the reform, although this might be managed during the transition. And, the CCB is roughly comparable to the proposed BIG for children. Leaving seniors and children out of a national BIG detracts from the comprehensiveness of the program, and that

would not be desirable in the long run. In our illustration below, we keep the CCB in place for simplicity, but replace OAS and GIS with our national BIG.

3. The third issue is the size of the federal BIG. Given that provincial RTCs and NRTCs remain in place in Stage One, they will be available to finance the provincial component of a national BIG in Stage Two. This means that the basic federal BIG can be correspondingly less than \$20,000 per single adult and \$6,000 per child. How much less depends upon the amount of revenue that is freed up for the provinces when they eliminate their tax credits. In our illustrative calculation below, we determine the federal BIG by first estimating the total tax expenditures of federal and provincial NRTCs and RTCs. The federal BIG is then \$20,000 times the federal share of total NRTCs and RTCs. A further adjustment in the federal BIG is needed to take account of the fact that the federal government assumes primary responsibility for transfers to seniors through OAS/GIS. To recognize this and to prevent seniors from suffering in Stage One, we assume the federal government offers the full national BIG to seniors in Stage One and continues to do so in Stage Two.
4. The fourth issue in implementing Stage One is that the provinces might undo the effect of the federal BIG by reducing their welfare and disability transfers. The federal government cannot require provinces to maintain the integrity of their transfer programs when a federal BIG is introduced. At best it can appeal to the provinces to keep their programs intact and only dismantle them in Stage Two. The force of this appeal is strengthened if the federal BIG does not tax-back provincial transfers, and if the generosity of the CST system is retained. But, the good will of the provinces must be relied on. There is precedent for this. When the CCB was introduced by the federal government in 2016, the provinces and territories voluntarily agreed that the CCB would not be clawed back from welfare or disability payments. One would hope for a similar reaction if a federal BIG is implemented.

The federal BIG would be administered by the CRA based on tax returns filed. Like existing RFCs, the entitlement to a BIG would be based on the previous year's tax return and recalculated each July. Since provincial tax and transfer programs would remain intact in Stage One, provincial finances would not be affected when the BIG is introduced. Vertical balance

would not be affected, so there would be no need to adjust federal-provincial transfers. This issue becomes relevant in Stage Two when provinces adopt harmonized BIG.

4.2 Stage Two: Provincial Harmonization

Once a federal BIG is in place, provinces would be invited to join. Those who chose to join would negotiate a bilateral national BIG (NBIG) agreement with the federal government. The basic structure of the NBIG would be based on the federal one, but provinces would have discretion over the size of their component. A common tax-back rate would apply initially, although in the long run there might be some flexibility for province-specific tax-back rates.

Provinces participating in a NBIG would replace their social assistance and disability transfers with a provincial BIG, where the NBIG would be the sum of the federal BIG and the province's chosen BIG level. The provincial BIG would be financed by eliminating their RFCs and NRFCs. Provincial social services would remain in place and would be conditioned on something other than social assistance or disability status. There would only be a single uniform provincial BIG with no distinction between welfare recipients and others. Provinces may choose to offer a higher provincial BIG rate to the disabled, in which case eligibility criteria for that would still apply.

The NBIG would be administered through the income tax system by the CRA rather than by individual provinces. Some mechanism would be required to recover from the provinces their shares of the NBIG. One option would be to do that through a revised CST, the currently equal per capita federal transfer in support of provincial social assistance, social services and post-secondary education. The CST could be reduced for participating provinces by the size of the provincial component of the NBIG, since the latter would be paid for by the federal government through the CRA.

5. An Illustrative Calculation

To illustrate the feasibility of implementing our proposed national BIG, we use Statistics Canada's Social Policy Simulation Database and Model (SPSD/M Version 22.1). The SPSSD/M is a vast repository of detailed information regarding the federal and provincial tax and transfer systems. It combines individual data from personal income tax returns, the Survey of Labour and Income Dynamics, unemployment and claimant histories and the Survey of Household Spending, excluding residents of the Yukon, Nunavut, the Northwest Territories and First Nation

reservations, and armed forces personnel residing in barracks. The SPSD/M is static, so cannot simulate behavioural responses to policy alterations without further assumptions. Despite this, the SPSD/M is particularly well-suited for this paper given its highly detailed depiction of the Canadian tax-transfer system.

Simpson and Stevens (2015) use the SPSD/M to examine the impact of converting all federal NRTC's into RTC's, which are then subject to a common clawback rate. While we follow their methodology, the scope of their proposed reform is quite different from ours since the level of income guarantee it is not substantial enough to represent a reasonable BIG. Also, they consider only federal tax credit reforms and not provincial ones. In this section, we extend the Simpson and Stevens (2015) approach to a BIG setting in a federal context.⁶

We first describe the effects of the two-stage implementation of BIG ignoring labour supply responses. Subsequently, we introduce the latter.

5.1 Implementing Federal and Provincial BIGs

Stage One involves eliminating the following federal NRTC's and RTC's: basic personal amount, age, married, married equivalent, employment, public transit, fitness, pension income, dependent caregiver, disability, all education credits, the family tax cut, family caregiver and infirm dependents, GST credit and WITB. Those credits that are contributory and not redistributive in nature (CPP, EI, political and charitable tax credits) are kept; OAS and GIS are also removed. The elimination of all tax credits as well as OAS/GIS is for simplicity. Similar results would be obtained if only the basic personal amount were eliminated and all other credits remained intact. The basic personal amount represents over three-quarters of all NRTC's, while OAS/GIS serves as a basic income for seniors. BIG is delivered to adults based on an adult-only family equivalence scale. Our proposal retains the CCB, which functions as a BIG for individuals under 18 years of age.

The federal BIG is calculated as \$20,000 times the share of federal transfers relative to provincial ones. The total value of federal NRTC's, RTC's and OAS/GIS is \$106.74 billion, while the value of provincial NRTC's and RTC's is \$42.31 billion. Therefore, the federal share of transfers eliminated is 71.6%, so that the federal BIG is \$14,322 (0.7161 times \$20,000). This applies to non-senior adults in all provinces who are in one-adult families and do not receive social assistance or disability benefits. For the latter, the amount of the federal BIG is \$14,322 less the average value of those benefits for various categories of persons. Table 1 indicates these

amounts. For families with two adults, the total federal BIG for all adults is $\sqrt{2}$ times \$14,322, or \$20,251, while for three-adult families, it is \$24,806. For seniors, the federal BIG is \$20,000 adjusted by adult-equivalence scales.

The tax-back rate is chosen such that the reform is roughly self-financing. The values of federal transfers eliminated are more than sufficient to ensure that the federal BIG is self-financing at a 30% tax-back rate. The tax-back rate applies to family net income (excluding welfare and disability transfers) until the guarantee reaches zero. The excess of financing (around \$8.09B) is prudent given the labour supply responses that we estimate below. As Table 1 indicates, with a tax-back rate of 30%, the federal BIG is phased out for single non-senior adult non-welfare recipients at a net income of \$47,740, which is lower than the income at which existing refundable tax credits and the OAS/GIS disappear.

In Stage Two, provinces would be invited to harmonize their transfer systems with the federal BIG. Those choosing to harmonize would take two steps. First, they would eliminate their welfare and disability transfers, and previous social assistance recipients would receive the standard federal BIG. Second, they would eliminate their NRTCs and RTCs to harmonize their income tax systems with the federal government's, and would choose their own provincial BIGs to supplement the federal BIG. The provinces could choose their own BIG levels, but the 30% tax-back rate would apply.

In the absence of behavioural responses, substituting a federal BIG for most federal RTCs and NRTCs and substituting a provincial BIG for provincial RTCs, NRTCs and social assistance amounts to pure income redistribution. Tables 2 and 3 illustrate the redistributive effects of these two stages. In Table 2, the average change in family disposable income for persons in each decile of the net income distribution are shown in absolute and percentage terms. Here, deciles are based on family-types according to family net income, and do not change when the federal BIG is introduced.

Not surprisingly, gains decrease as one goes up the decile groups, except for the top two deciles. Those in the bottom decile reap an average gain of 167% in disposable income over the two stages, while the top group loses 5.39% on average. The changes follow the same pattern in Stage One, but are proportionately less. The losses at the top are all due to eliminating the benefits of tax credits, and these are relatively uniform in absolute terms in the top five deciles. Only the bottom half of the population in terms of net income obtain some BIG transfer, and that

diminishes as income increases. Note that the average change in disposable incomes is negligible overall, reflecting the fact the revenues raised roughly cover the cost of providing the BIG.

Table 3 focuses on families in the bottom decile of the net income distribution of all persons, and shows how the gains from the federal and national BIGs vary by family type within this decile. On average, each of the different family groups appear to benefit quite a bit from the basic income. Of particular note is the fact that elderly single persons and single parents gain the least. This is because they fare relatively well under existing programs, especially the elderly. Indeed, some elderly OAS/GIS recipients may be worse off as a result of the federal BIG reform since their initial disposable income exceeds the federal BIG. To the extent that this is a concern, program design would have to address it in a further refinement.

Table 4 shows how poverty and income distribution measures are affected by the BIG reform. The poverty level is taken to be the after-tax LICO amount for various family types. The rate of poverty is the proportion of the relevant population below that level. The rate of poverty falls significantly for all groups except senior couples, and the average poverty rate falls by 73%. The rate of poverty rises to 6.1% for senior couples who had the lowest poverty rate before the Stage One reform, which is a cause for concern to be addressed. A similar picture emerges for changes in the Gini Coefficients, which are based on disposable income. As the last row indicates, the Gini Coefficient falls by almost 10% in Stage One and over 17% in both stages. This indicates that inequality has been reduced significantly.

The implementation of the national BIG would be roughly revenue-neutral. The overall cost of BIG would be \$162.84 billion, of which \$98.65 billion is in Stage One. Revenues from eliminating federal and provincial transfers would be \$162.25 billion, of which \$106.74 billion is federal, leaving a budget deficit of only \$0.59 billion.

5.2 Labour Supply Responses

The above redistributive effects include only the impact effects of the policy change and ignore behavioural responses. The replacement of RTCs, NRTC and social assistance with the national BIG will change both income levels and effective marginal tax rates (EMTR) on income. These will affect labour supply through standard income and substitution effects. Higher income groups will face a reduction in income and this will encourage an increase in labour supply. By the same token, those in the lower part of the income distribution will obtain higher incomes and this will discourage work.

The substitution effect is more complex. In 2015, the first \$45,282 of taxable income was subject to a federal tax rate of 15% and provincial tax rates of approximately 5%. The introduction of BIG will increase the EMTR in this bracket to 50%. This is relatively large and has the potential to significantly distort labour decisions. Because the exit level of BIG is roughly \$48,000, mainly individuals in this bracket will face the higher EMTR. For those who do not receive any BIG, their EMTR will be unaffected. In addition, since most of the RTCs and NRTCs as well as OAS/GIS being eliminated are also clawed back, the EMTR before the BIG is introduced will be higher than the statutory marginal tax rate for many taxpayers. However, given the variability of NRTCs and RTCs, an illustrative calculation capturing the change in EMTRs after their removal is too difficult to estimate so we ignore it. In estimating substitution effects from introducing the BIG, we therefore assume that the EMTR rises from 15% to 50% for BIG recipients, but remains unchanged for non-recipients. This will induce lower-income persons to reduce their labour supply, thus reinforcing the income effect. For higher income persons, there is no substitution effect so their labour supply should unambiguously increase.

To estimate the behavioural impacts of the BIG, we follow the methodology of Simpson and Stevens (2015). Changes in labour supply will depend on substitution and income elasticities. Based on a recent survey of academic work by McClelland and Mok (2012), Simpson and Stevens assume that income elasticities for both men and women are 0.05, while substitution elasticities are 0.2 for men and single women, and 0.3 for married women. The percentage change in earnings from the income effect is the income elasticity times the percentage change in disposable income.. That due to the substitution effect is the substitution elasticity by the percentage change in the after-EMTR wage rate.⁷

Table 5 shows that the combination of Stages One and Two causes labour supply, and therefore earnings, to fall in the bottom seven deciles, especially in the lower deciles. Earnings rise moderately in the top three deciles, so overall earnings fall by only \$492, or 1.5%. This is entirely due to the substitution effect since the income effect is zero on average. The change in labour supply induces changes in BIG expenditures as well as changes in income tax revenues. Overall, the reduction in labour supply causes the cost of the national BIG reform to rise to from \$162.84 billion to \$167.69 billion, resulting in an overall budget deficit of \$5.44 billion. This is the additional amount of revenues that would have to be raised to finance the national BIG, and is relatively modest. If only a federal BIG is implemented and the provinces choose not to

harmonize, the changes in BIG entitlements and tax liabilities as a result of labour supply changes will reduce the total cost of the program by \$3.25 billion (\$98.65 billion to \$95.40 billion). Recall earlier that in the absence of behavioural responses, implementing the federal BIG would result in a surplus of \$8.09 billion. This excess will increase as a result of behavioural responses, leaving a surplus after Stage One of about \$11.34 billion.

The labour supply effects summarized in Table 5 are based on estimates of changes in labour supply along the intensive margin, that is, variations in hours of work. For many workers, the relevant labour supply decision is an extensive-margin one including whether to participate in the labour market, what type of job to seek, and what activities to pursue if one chooses not to participate. For example, non-participation can be socially productive if it is used to improve one's skills or to spend time raising children. The relevant tax rate from this perspective is the participation tax rate measuring the net additional tax payment incurred or transfer lost by an individual when moving from unemployment to employment. Such calculations are beyond the scope of this paper but deserve further attention.

6. Concluding Comments

There are some general lessons that can be taken away from our analysis and illustrative calculations. First, it is feasible to implement a national BIG scheme in a federal setting where the federal government and the provinces have both a common interest in redistributive goals and the policy instruments to achieve them. We have suggested adopting a system analogous to existing federal-provincial tax harmonization to deliver joint federal and provincial BIG programs through the income tax system. Second, we have argued that it is feasible to finance a national BIG by eliminating existing refundable and non-refundable tax credits and using the proceeds as a sole source of funding.

As a final lesson, however, our simulations show that even if we insist on a revenue-neutral policy reform to a national BIG, the tax-back rate need not be excessive. In our example with a single tax-back rate of 30%, the combined effective marginal tax rate for those at the bottom of the income distribution is of the order of 50% when federal and provincial tax rates are taken into account. This is not out of line with what one finds in the optimal income tax literature (e.g., Tuomala, 2016). Reducing the tax-back rate further, while maintaining the size of the basic guarantee, would be feasible if increases in general tax revenues are used to finance it. More

generally, adopting more complex tax-back rate structures can mitigate incentive effects at the bottom of the income distribution, particularly those that affect labour market participation.

There are some additional issues worth exploring in future research. First, the labour supply estimates we use do not include family labour supply decisions. That is, they fail to capture joint decision-making that may occur in the household. Second, we do not perform a sensitivity analysis over different tax back rates or labour supply elasticities. For example, we could evaluate a basic income that is not taxed back until after some specified level of income. Such a design would reduce employment participation disincentives. Alternatively, we could examine a BIG that is similar in design to the WITB, which has both phase-in and phase-out rates. Third, we could consider many other behavioural responses, such as the effect of BIG on savings and participation decisions. Finally, this paper does not consider how a basic income would be administered to First Nation members on reserves, which have their own unique political systems.

Appendix

Table 1: Parameters of the Proposed Basic Income Guarantee - Stage One

	Basic Income Guarantee	Reduction Rate	Exit Level
Single Non-Senior Adults	\$14,322	30%	\$47,740
Single Seniors	\$20,000	30%	\$66,667
Provincial Welfare or Disability Recipients			
Single Employable	\$6,801	30%	\$22,670
Disabled Persons	\$2,558	30%	\$8,527
Single Parent, One Child	\$3,325	30%	\$11,083
Two Parents, Two Children	\$10,513	30%	\$35,042

Note: Adult equivalence scales are applied. The exit level refers to the family net income at which BIG entitlement becomes zero.

Table 2: Impact of BIG on Family Disposable Income by Family Net Income Decile, 2015

Decile	Average BIG	Average Family Disposable Income			% Change in Disposable Income	
		Pre-BIG	Stage 1	Stage 2	Stage 1	Stage 2
Bottom	\$20,353	\$8,868	\$19,422	\$23,690	119.01%	167.14%
Second	\$18,054	\$14,709	\$21,334	\$25,578	45.04%	73.89%
Third	\$15,504	\$21,308	\$25,263	\$28,623	18.56%	34.33%
Fourth	\$12,540	\$28,253	\$29,370	\$32,581	3.95%	15.32%
Middle	\$8,420	\$36,123	\$33,792	\$36,151	-6.45%	0.08%
Sixth	\$3,569	\$45,254	\$40,628	\$41,085	-10.22%	-9.21%
Seventh	\$712	\$55,474	\$50,151	\$48,486	-9.60%	-12.60%
Eighth	\$0	\$71,013	\$65,604	\$63,125	-7.62%	-11.11%
Ninth	\$0	\$92,725	\$87,427	\$84,764	-5.71%	-8.59%
Top	\$0	\$175,961	\$171,009	\$166,479	-2.81%	-5.39%
Aggregate	\$7,912	\$54,982	\$54,411	\$55,066	-1.04%	0.15%

Source: Statistics Canada, Social Policy Simulation Database and Model (SPSD/M). Version 22.1. Tabulations by authors.

Table 3: Average Impact of BIG on Family Disposable Income by Families Types in the Bottom Decile, 2015

	N (000s)	Average BIG	Average Family Disposable Income			% Change in Disposable Income	
			Pre-BIG	Stage 1	Stage 2	Stage 1	Stage 2
Single Parent	150	\$19,871	\$24,869	\$29,680	\$35,169	19.35%	41.42%
Two Parent	59	\$27,515	\$28,188	\$43,384	\$45,675	53.91%	62.04%
Non-Senior Single	1,661	\$19,772	\$5,830	\$16,855	\$21,505	189.11%	268.87%
Non-Senior Couple	65	\$27,874	\$14,011	\$30,359	\$33,135	116.68%	136.49%
Senior Single	90	\$19,453	\$17,700	\$20,731	\$21,297	17.12%	20.32%
Senior Couple	30	\$27,029	\$20,457	\$34,623	\$30,130	69.25%	47.28%
Disabled Persons	907	\$20,654	\$12,843	\$21,532	\$24,635	67.66%	91.82%
Aggregate	2,962	\$20,353	\$8,868	\$19,422	\$23,690	119.01%	167.14%

Source: Statistics Canada, Social Policy Simulation Database and Model (SPSD/M). Version 22.1. Tabulations by authors.

Table 4: BIG Impact on Rate of Poverty and Gini Coefficient by Family Types, 2015

	Rate of Poverty				Gini Coefficient			
	Pre-BIG	Stage 1	Stage 2	Impact	Pre-BIG	Stage 1	Stage 2	Impact (%)
Single Parent	15.9%	0.1%	0.1%	-99.37%	0.3076	0.2782	0.2339	-23.96%
Two Parent	4.9%	1.1%	0.6%	-87.76%	0.3059	0.3066	0.2992	-2.19%
Non-Senior Single	26.0%	12.9%	4.9%	-81.15%	0.4714	0.3233	0.2630	-44.21%
Non-Senior Couple	4.3%	1.9%	0.4%	-90.70%	0.3570	0.3573	0.3497	-2.04%
Senior Single	10.3%	7.9%	5.5%	-46.60%	0.2919	0.2744	0.2505	-14.18%
Senior Couple	2.3%	5.1%	6.1%	165.22%	0.3364	0.3876	0.3872	15.10%
Disabled Persons	16.4%	9.9%	5.2%	-68.29%	0.4221	0.3855	0.3554	-15.80%
Aggregate	11.9%	6.2%	3.2%	-73.11%	0.4603	0.4144	0.3801	-17.42%

Source: Statistics Canada, Social Policy Simulation Database and Model (SPSD/M). Version 22.1. Tabulations by authors.

Table 5: Substitution and Income Effects of Individual Tax-Filers by Family Net Income Decile (Measured by Percent of Employment Earnings), 2015

Decile	Average Earnings	Stage 1			Stage 2		
		SE	IE	Total	SE	IE	Total
Bottom	\$594	-7.9%	-16.6%	-24.5%	-8.5%	-24.0%	-32.5%
Second	\$4,575	-6.1%	-4.3%	-10.4%	-7.2%	-6.7%	-13.9%
Third	\$7,868	-6.0%	-1.5%	-7.5%	-7.3%	-2.7%	-10.0%
Fourth	\$12,015	-5.9%	-0.5%	-6.4%	-7.3%	-1.2%	-8.5%
Middle	\$16,598	-4.9%	0.1%	-4.8%	-7.4%	-0.4%	-7.8%
Sixth	\$23,355	-1.8%	0.3%	-1.5%	-5.6%	0.1%	-5.5%
Seventh	\$29,959	-0.1%	0.2%	0.1%	-2.7%	0.3%	-2.4%
Eighth	\$38,898	0.0%	0.2%	0.2%	0.0%	0.3%	0.3%
Ninth	\$51,375	0.0%	0.2%	0.2%	0.0%	0.3%	0.3%
Top	\$99,774	0.0%	0.1%	0.1%	0.0%	0.2%	0.2%
Aggregate	\$33,638	-0.7%	0.0%	-0.7%	-1.5%	0.0%	-1.5%

Source: Statistics Canada, Social Policy Simulation Database and Model (SPSD/M). Version 22.1. Tabulations by authors.

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¹ A more ambitious program would harmonize BIG with the income tax system so a single tax rate schedule applies to the BIG and all other income combined as in the optimal income tax literature. In this unified tax-transfer system, marginal tax rates would be relatively high at lower incomes to target transfers to the least well-off.

² With decreasing marginal utility in income, giving an additional dollar to a low-income person increases their utility by more than giving the additional dollar to a high-income person.

³ It will not be feasible to redistribute so much that utilities are equalized. In the literature this is precluded by an equity-efficiency trade-off resulting from the inability of the government to identify persons by their skill. At best, incomes can be observed, and these incomes can be affected by individuals' behaviour.

⁴ More precisely, each person's welfare is indexed by the slope of a ray through the origin that is tangential to their utility level, that is, a virtual laissez-faire skill level. According to this index of utility, the worst-off individuals are the most industrious ones with the lowest productivity. The optimal redistribution scheme transfers resources to them to maximize their utility index.

⁵ The Drummond Report (2012) noted that in Ontario, social assistance comprised about 51% of social program spending in 2010–11 with the remainder consisting of various social services (Chart 8.1).

⁶ A preliminary version of our simulations was undertaken in Koebel (2016).

⁷ See appendix in Simpson and Stevens (2015) for more details.