

**Design Choice for Income-Transfer Programs:  
Structural, Economic, and Operational Aspects**

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## **Abstract**

Income-transfer programs are a key element of social policy to ensure that individuals have a base assured level of income. Their eligibility criteria and how their benefits are structured are critical to their targeting, efficacy, incentives, and cost. This study provides a comprehensive description of the two main genres of transfer programs—income maintenance and earnings supplementation—and their subtypes and reviews the associated structural, economic, and operational aspects for each. Major design choices for each program type are reviewed for their economic and incentive effects, and related empirical literature is reviewed. Trade-offs among the program parameters associated with benefit adequacy, incentive effects, and program cost are assessed, as are the trade-offs among benefit responsiveness, incentive effects, and operational burdens associated with different benefit accounting methods. The study then applies its findings and insights to a broad assessment of implications for income-transfer policy choices in British Columbia.

## Introduction

Programs that transfer incomes to individuals and families can be designed and applied in a variety of ways, with resulting differences in their distributional, incentive, budgetary, and operational aspects. This study canvasses the range of possible program structures and describes their main attributes in relatively non-technical terms. Excluded from my purview are social insurance programs—those that require contributions for eligibility and link benefits to previous payments.<sup>1</sup> Also excluded from this study are in-kind benefit programs, which provide directly or incentivize through subsidies or tax provisions the purchase or consumption of particular goods or services.<sup>2</sup> Thus, my focus will be on programs that transfer money that beneficiaries are free to spend as they wish without facing different prices on various goods and services than non-beneficiaries.<sup>3</sup> As a general proposition, the design of income-transfer programs is a problem of targeting benefits to individuals with greatest need or value, based on specified criteria, with due attention to incentive and behavioural impacts as well as operational considerations.<sup>4</sup>

My study begins by discussing policy objectives and values and how they relate to key choices in the design of transfer programs. I then describe the benefit structures of various program formats that can be utilized for income transfers, followed by a review of the practical design issues that need to be settled regardless of the program format. Next I assess the comparative incentive, budgetary, targeting, responsiveness, and other main economic attributes associated with each design. I then discuss issues arising in the accurate classification of applicants and beneficiaries by relative need or employability. Empirical research findings on the labour and non-labour effects of major transfer formats are next summarized. Accounting and timing issues are assessed in detail, along with the implications for administration and compliance with each design. I then turn to issues related to coordination with existing tax and benefit programs, inter-program eligibility, and the categorization of beneficiaries and conditionality of benefits. My study concludes with a discussion of the broad

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<sup>1</sup> Social insurance programs typically pay larger benefits to individuals whose previous earnings (and thus premium payments) were higher, thus limiting their efficacy in redistributing toward lower earners and those unable to work. In contrast, income-transfer programs consider only the current or recent earnings or incomes of prospective beneficiaries, and for most such program structures the benefits paid are inversely related to those earnings or incomes.

<sup>2</sup> However, an in-kind benefit may take on economic and incentive characteristics similar to those of an income transfer in cases where the affected good or service is “fungible” (easily converted into money by a beneficiary who does not wish to consume or use it) or is “infra-marginal” (less than the amount that the beneficiary would have purchased in the absence of the in-kind benefit). See Kesselman and Mendelson (2020) for discussion of these issues and principles in the choice of format between income-transfer and in-kind benefit programs. Also see Anderson (2001) for discussion of basic income versus services.

<sup>3</sup> Money here includes both direct payments and also amounts disbursed through the tax system or via reduced tax liabilities, so long as the levels of benefits are independent of the beneficiary’s expenditure choices or use of the funds.

<sup>4</sup> Analytical and practical treatments of the targeting problem are provided in Akerlof (1978); Besley and Kanbur (1993); and Schuck and Zeckhauser (2006).

implications and limitations for the choice of format and design for income-transfer programs within the British Columbia policy context.<sup>5</sup>

### **Objectives, Values, and Transfer Design**

Policy objectives for the income-transfer system are diverse and sometimes contentious based on differing values. Paramount is the provision of an income floor to prevent persons from falling below some specified level; whether this floor should be the poverty threshold or some other figure is a policy choice. Similarly, whether and how this floor should be varied with characteristics of a beneficiary unit is a policy choice. In particular, whether this floor should be guaranteed regardless of the beneficiary's engagement in the labour market or conditional on work or another activity is a policy choice. Thus, a key choice is whether programs should make distinctions based on ability/disability, employability, or care obligations in their eligibility criteria and/or benefit levels. In part, this choice is related to assessments of relative need, which may stem from notions of comparative "deservingness."<sup>6</sup> Often individuals with the capacity to engage in paid employment are deemed to be less deserving of unconditional cash support than those who are deemed less able or unable to work. Whether and how this distinction affects the design of transfer programs is an important issue.

How are assessments of deservingness formed and what is their role in the formulation of and support for income-transfer programs? Personal views about the relative deservingness of particular groups tend to dominate broader statements of values in attitudes of support for or opposition to programs (see Bang Petersen, et al. 2010). Stereotypes about the characteristics and behaviour of beneficiaries often enter the equation. Moreover, specific informational cues or the framing of policies can influence these assessments. At a more foundational level, these views derive from how people construct the attribution of responsibility for an individual or group's problem, which is poverty in the present context.<sup>7</sup> If the problem is attributed to an incapacity or external constraint on the individual to do better, then their deservingness will be rated more highly.<sup>8</sup> Examples include disabilities, a child's dependency, advanced age, and severe recession. Conversely, if the individual is assessed as being physically and mentally able and not hindered by external constraints, then the responsibility for poverty is more likely attributed to them, with a lower deservingness rating. Non-conformity to social norms, such as unconventional customs like communal living, can also reduce the deservingness rating. These views of deservingness are clearly reflected in actual programs' differential treatment based on employability.

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<sup>5</sup> These matters are refined and developed in greater detail in other studies undertaken for the Expert Panel on Basic Income, British Columbia, along with the Panel's final report.

<sup>6</sup> For analyses linking notions of relative deservingness to the structure of transfer programs, see Appelbaum (2001) and the studies in Van Oorschot, Roosma, Meuleman, and Reesken (2017).

<sup>7</sup> See Steiner (1970) and Brickman et al. (1982) for social psychological analysis of how people form views on deservingness based on attribution of responsibility for problems and solutions.

<sup>8</sup> As Brickman et al. (1982, 376) state, "When people say that someone deserves help, they may mean only that this individual is not to be blamed for their problems."

Regardless of one's position on the role of deservingness, most observers concur that transfer programs should seek to minimize disincentives for beneficiaries to engage in the labour force, work more and seek better jobs, and upgrade their work skills. The independence, self-respect, status, and social connections that come with working are attributes valued by many reform advocates, consistent with widely shared norms concerning work and dependence on public support. These attributes are emphasized in particular by proponents of income-transfer formats that tie benefits to earnings or wages for those able to work.<sup>9</sup> In contrast, some advocates of a universal basic income (UBI) assert that income should be delinked from work to provide individuals "real freedom" to pursue whatever life goals they wish.<sup>10</sup> However, other basic income proponents would apply a "participation" requirement for eligibility in order to conform to social norms and enhance public support.<sup>11</sup> These proponents tend to view activities such as volunteering and caregiving as having social value on par with paid employment.

Many other objectives for an income-transfer system are more widely shared. A key reason for preferring the use of income transfers rather than in-kind benefits is to allow beneficiaries to exercise autonomy over their consumption choices; associated with this is the notion that beneficiaries will achieve a higher level of well-being if allowed to make these choices. Receiving income transfers that the beneficiary is free to spend without any constraints also makes the benefits more like the incomes that others receive through their work earnings. Other widely endorsed objectives are that income-transfer programs should be easy to access and administer, and that they should entail minimal stigma or shame in their use. Equity in access and in the benefit levels relative to the needs of recipients are other common objectives. These criteria imply the salience of properly measuring relative needs, so that misreporting of incomes and employability by potential beneficiaries are contained as far as possible.<sup>12</sup> At the same time, another policy concern is minimizing intrusion into the lives and privacy of beneficiaries. Clearly, conflicts among these objectives will arise in many particular circumstances.

### **Structural Formats: Overview**

Income-transfer programs can take a variety of structural formats relating the net benefits to the economic situation of beneficiaries. For analytical purposes it is helpful to group these formats into two categories: (a) income maintenance (IM): structures with a benefit amount that is paid even for persons with zero income or earnings but the net amount *declines* with their income or earnings; and (b) earnings supplementation (ES): structures where the benefit amount is contingent on work or earnings and *rises* with the amount of work or earnings

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<sup>9</sup> See the arguments for a wage rate subsidy by Phelps (2001, 2007); Kesselman (1968) discusses these issues in an early comparative analysis of the negative income tax and wage rate subsidies.

<sup>10</sup> See the arguments for UBI by its leading advocate, philosopher Van Parijs (1995).

<sup>11</sup> This view is exemplified by Atkinson (1996) in the U.K. and Osberg (2018, 192–93) in Canada. See the symposium in *The Political Quarterly* (2018) for supportive and critical perspectives on the "participation income" variant of a UBI.

<sup>12</sup> Later in this study I assess the issue of errors in classification of program applicants.

(at least over some range). Thus the incentives of these two types of formats are very different: IM programs penalize returns to work and earnings, while ES programs reward work and earnings. These differences will be a major focus of my later economic analysis of the incentives for various aspects of individual and family behaviour associated with each program type and related design choices.

IM programs are most suitable for persons with limited or no potential for work and persons who are deemed not expected to work (such as children, parents with infants, and those with major disabilities or beyond an accepted retirement age). ES programs are best suited for working-age adults who have no major barriers to employment. This distinction further implies a potential need to differentiate among individuals in assigning program eligibility. Some persons deemed to be “employable” may face difficulties in obtaining work of sufficient magnitude or regularity and thus require at least partial support of the IM variety. And many persons who face barriers to full labour market engagement have some ability to work, and thus a program’s design should not confront them with severe penalties on seeking earnings to supplement their transfer benefits. The optimal balance between programs of the IM and ES genres will hinge in part on policy objectives and the preferences of voters/taxpayers as well as the beneficiary population.<sup>13</sup>

### **Structural Formats: Income Maintenance<sup>14</sup>**

Transfer programs aimed primarily at income maintenance are characterized by structures that have net benefits declining over all or part of the income range affecting beneficiaries. Included in this category are the UBI, the negative income tax (NIT), the refundable tax credit (RTC), and welfare (a generic label for provincial income assistance programs or IA). This format offers a guarantee amount (G) that is paid to all eligible units that have zero income; the value of G for a given beneficiary unit can be a function of its age, family size, family type, employability/disability, locale, and/or specified special needs. The net benefit paid is equal to the unit’s G minus a tax-back rate<sup>15</sup> (r) multiplied by its income (possibly with an exempt income amount). Programs with this structure have a “break-even income” (B) level at which the guarantee amount is fully offset by the tax-back amount; thus for incomes of B and higher the net benefit is zero. However, financing a program requires higher taxes, such that some units with incomes below B may incur additional taxes and thus be net losers from the program.<sup>16</sup> IM programs typically do not require that persons work in order to be eligible for the basic guarantee, although some variants include work or job search requirements.

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<sup>13</sup> See the analytical treatment in Rodgers (1973).

<sup>14</sup> Tedds, Crisan, and Petit (2020) canvas the key design choices for transfer programs of the IM genre as well as the specific campaign commitments by political parties in Canada.

<sup>15</sup> This term is also commonly called a clawback rate or benefit reduction rate.

<sup>16</sup> Whether this outcome arises depends upon the relationship between the unit’s B and the nature and pattern of the tax increases used to finance the program. Note that the other transfer program formats also need to be financed, which can similarly impose additional net tax burdens on units who are otherwise net beneficiaries of the program.

## Universal Basic Income

The universal basic income (UBI) structure is characterized by a guarantee amount that may hinge on age or other basic attributes but independent of behaviour.<sup>17</sup> Unique to the UBI is the lack of a tax-back rate ( $r = 0$ ), which means the benefit does not decline with income. And because the UBI benefit is paid to all units regardless of how high their income, it does not have a break-even income ( $B$  is infinite; see Figure 1). However, this type of program's large cost necessitates financing via either an *ex post* benefit clawback based on income or major tax hikes, which in turn makes the net benefit to recipients decline at least above a specified income level. Table 1 summarizes these attributes of a UBI structure along with the other types of IM programs. The table indicates that UBI benefits would be paid on a gross basis, with any recovery or tax financing undertaken *ex post*; all households would automatically receive the full guarantee, ensuring ready availability in case of any decline in their earnings. Most likely the UBI would be delivered as a regular direct payment by an agency separate from the tax office, although this is not essential.

## Income Testing of Benefits

The next three structural formats for transfer programs—the NIT, RTC, and IA—embody income testing of benefits by applying a tax-back rate to beneficiary incomes. Tax-back rates are greater than zero and for IA can go up to 100% ( $0 < r \leq 1$ ). Figure 1 displays the patterns of net benefits relative to incomes for these program types along with the UBI. In terms of their benefit schedules, the NIT and RTC are identical for given parameter values  $G$  and  $r$ ; as explained below, they differ in their administration and responsiveness to beneficiaries' income variations. The break-even incomes for those types of programs follow the relationship  $B = G/r$ . Thus, for a given guarantee level, the break-even income is inversely related to the tax-back rate, which will prove central in my later analysis of incentives and cost in program design. The tax-back rate in a classic welfare or IA program is 100%, so that  $r = 1$  implies  $B = G$ . In that situation the beneficiary loses benefits dollar-for-dollar with any increase to their income.

## Negative Income Tax

The Negative Income Tax (NIT) provides periodic disbursement of benefits (say, monthly) based on the beneficiary unit's frequent reporting of incomes. This frequent income reporting allows net benefits to be adjusted rather quickly to variations in the beneficiary's earnings and thus need; this format was used in all the NIT experimental pilot projects undertaken in Canada and the United States. Since Canada's tax department is not set up for anything more frequent than annual retrospective reporting of individual incomes, this process would need to be administered by a new agency (or new capacity within the tax agency). If the NIT is intended to cover the lower-income, working-age populations, such frequent income reporting is important on account of this group's high variability of work hours, jobs, and seasonality of work. Failure to capture these income fluctuations to adjust the payments will

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<sup>17</sup> A variant of the NIT or UBI is the "participation income;" see note 11.

otherwise result in horizontal inequities,<sup>18</sup> overpayments, and excessive program cost. Provisions to recover such overpayments will entail further administrative cost and hardship for some affected families.

### **Refundable Tax Credit**

The Refundable Tax Credit (RTC) can also make periodic payment of benefits, but it operates solely on the retrospective reporting of annual incomes for ordinary income tax purposes. Thus, the RTC format is very slow in responding to changes in a beneficiary unit's income.<sup>19</sup> For example, a sharp change in earnings early in a year will not be reflected in benefit changes until the middle of the following year, after the filing and processing of tax returns. This deficiency may be less consequential for Canada's RTC for low-income seniors (the Guaranteed Income Supplement) on account of their typically lesser income variability, but it is an issue for the RTC for working families with children (the Canada Child Benefit<sup>20</sup>) who have higher earnings variability. Offset against this deficiency in responsiveness, the RTC avoids the need for frequent income reporting and associated horizontal inequities and overpayments, as I explain in a later section.

### **Welfare or Income Assistance**

The classical income assistance (IA) program imposes a dollar-for-dollar offset of a beneficiary's income against benefits (a 100% tax-back rate;  $r = 1$ ). That structure yields  $B = G$ , which confines benefits to individuals at very low or zero incomes and thus economizes on the program's cost. The structure also imposes severe disincentives on beneficiaries seeking work unless they can earn substantially more than the break-even.<sup>21</sup> As a result of this problem, IA program structures have often been modified to provide at least a modest incentive for beneficiaries to seek some earnings. Two types of incentives can be introduced: a flat dollar amount of exempt earnings ( $E$ ) per period; and a "disregard" of a specified percentage of earnings ( $e$ ) that will not be counted in the dollar-for-dollar offset. The use of a percentage disregard is equivalent to a tax-back rate of 100% minus that rate ( $r = 1 - e$ ). For example, a 25% disregard is identical to a 75% tax-back rate. Figure 2 illustrates how each type of exemption affects the break-even income for an IA program; budget line IA depicts no exemption, IA' the flat exemption, and IA" the proportionate exemption. The corresponding

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<sup>18</sup> As detailed later, the inequities arise as between individuals with greater and lesser variability but the same average level of earnings. For example, a worker whose earnings fluctuate above and below  $B$  will receive benefits in some periods, while another worker with stable earnings at the same average rate  $B$  will never receive benefits.

<sup>19</sup> A leading proponent of the UBI noted this issue: "[A]ny NIT scheme would have the desired effects on poverty only if it was supplemented by a system of advance payments sufficient to keep people from starving before their tax forms are examined at the end of the fiscal year" (Van Parijs 2001). In our present terminology, he was referring to the RTC and not the NIT.

<sup>20</sup> Payments of CCB can be adjusted quickly only for changes in marital status that affect joint incomes subject to the program's tax-back.

<sup>21</sup> The structure and incentive effects of the U.S. welfare system have been extensively researched; see the surveys in Moffitt (2003b) and Ziliak (2016) for provisions including work requirements.

break-even incomes are depicted as B, B', and B'', respectively. The two types of exemption can also be offered jointly.

### **Structural Formats: Earnings Supplementation<sup>22</sup>**

Earnings supplementation programs are characterized by structures that have net benefits rising over at least some range of the beneficiary's earnings. Included in this category are the NIT with a work requirement (NIT-WR), the earnings tax credit (ETC), a combination of RTC with ETC (ETC-RTC), and the wage rate subsidy (WRS).<sup>23</sup> Table 2 summarizes properties of the various ES formats. Most of these transfer formats offer no guarantee sum for individuals without work or earnings, though they can be combined with transfers from the first category (either for the beneficiary or other family members). A key distinction between the two categories of transfer design is that IM programs have net benefits decreasing with work effort and earnings, while ES programs offer rising net benefits for some levels of work and earnings. This difference has major implications for the incentive effects of transfers—and possibly public and political acceptance—to be assessed in depth in a later section.

Because transfer designs in this category generally offer no guarantee for those without earnings, they would need to be combined with transfers from the first category using categorical treatment based on criteria of disability and employability. Even for transfer programs of the IM category, such distinctions are needed if persons suffering disability or other impediments to working are to be granted higher guarantee levels than the broad working-age population. Thus, this conceptual and operational challenge is not confined to the second category of programs. Moreover, in periods of high local or regional unemployment, many able, employable persons cannot readily find work. Addressing those situations may require the issuance of waivers to grant such persons access to the first category of transfers; the details of this will hinge on the adequacy of unemployment insurance benefits and the possible provision of special public work.

#### **NIT with Work Requirement**

The NIT can be combined with a requirement that individuals work at least a certain amount in order to be eligible for benefits (NIT-WR).<sup>24</sup> Without meeting the required work hours,

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<sup>22</sup> How to design transfer policies for effective work incentives (or “in-work benefits”) has been a recurrent concern in applied policy in North America and Europe. See, for example, Aaron (1975a); OECD (2000); Greenberger and Anselmi (2003); Social Research and Demonstration Corporation (2006); and Hoynes, Rothstein, and Ruffini (2017).

<sup>23</sup> Special public employment offers another way to facilitate earnings for persons who are usually employable but face temporary barriers to finding work, such as very high regional unemployment; this format is not pursued in the present study. See Hegner (1974); Fechter (1974); and Kesselman (1980) for analysis of design and implementation issues facing large-scale programs of this kind.

<sup>24</sup> An example is the Self-Sufficiency Project undertaken on a pilot basis in 1992–1995. It required individuals to work an average of at least 30 hours per week to be eligible for NIT-type benefits. The project was restricted to sole parents who had been on IA long term and could opt to remain on or return to IA. See Ford et al. (2003). Also see Kesselman and Riddell (1995) for an assessment of alternative program formats for the Self Sufficiency Project.

an individual would not get any benefits, but otherwise the net benefits follow the standard NIT formula with a tax-back on earnings. For a work requirement of  $H$  hours per period, an individual with hourly wage rate  $W_i$  would be earning at least  $W_i H$  per period. Thus, the maximum net benefit that the person could receive would be  $G - rW_i H$ , which is clearly less than the notional guarantee level  $G$ . Figure 3 portrays the budget line for a program with these properties. Some issues affecting the NIT with Work Requirement (NIT-WR) are the need to report, monitor, and enforce the hours requirement. Many low earners have variable hours and jobs (often multiple jobs), which means that falling below the  $H$  requirement temporarily yields a loss of all benefits for that period unless averaging is allowed.

### Earnings Tax Credit

The earnings tax credit (ETC) format provides net benefits that rise over a range of low earnings and thus can increase incentives for individuals to enter the labour force.<sup>25</sup> The ETC design has an initial range of earnings that attract no subsidy but with subsidy rate  $s$  on earnings above a positive threshold  $T_1$  and up to  $T_2$ . Thus, the maximum amount of subsidy per period is  $s(T_2 - T_1)$ , which remains constant for earnings between  $T_2$  and  $T_3$ . Earnings beyond  $T_3$  incur tax-back rate  $r$  until a break-even income  $B$  arises at  $T_3 + s(T_2 - T_1)/r$ . Typical design of the program applies a lower phase-out rate than the subsidy rate ( $r < s$ ). Figure 4 displays the resulting pattern of net benefits with respect to the individual's earnings. A worker's earnings are routinely reported on an annual basis, so that the earnings subsidy can operate without any additional information. However, like the RTC this method of delivery suffers from potentially long lags between a worker's earnings variation and the associated benefit adjustment. Major examples of the ETC are the U.S. Earned Income Tax Credit (EITC) and the Canada Workers Benefit, formerly called the Working Income Tax Benefit.

The Canadian Working Income Tax Benefit and Canada Workers Benefit followed the structure set earlier in the Earned Income Supplement component of the Child Tax Benefit program introduced in 1993. These provisions in turn were patterned after the EITC that the U.S. instituted in 1975.<sup>26</sup> However, the EITC originally had no "flat" portion of the benefit schedule ( $T_2 = T_3$ ), which was added in 1979, and unlike all of the Canadian provisions has never had an initial range of earnings not eligible for subsidy (see Hotz and Scholtz 2003, 145). The policy choice to have an exempt range of earnings ( $T_1 > 0$ ) in the Earned Income Supplement might be explained by the federal government's lack of confidence in the early 1990s that provinces would pass along any gains from the Child Tax Benefit to welfare beneficiaries; the provinces could simply offset welfare benefits by the increased amount of

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<sup>25</sup> See Haveman (1975) for original formulation of the ETC format.

<sup>26</sup> The U.S. EITC was developed and instituted in response to protracted opposition to the Nixon administration's proposal in 1969 of the Family Assistance Plan, initially an unconditional NIT, although it later introduced a work requirement. See Nichols and Rothstein (2016, 143).

child benefit (see Kesselman 1993, 111).<sup>27</sup> Regardless, this structure serves to strengthen the policy's labour-force incentive at the cost of reduced anti-poverty impact.

### **ETC with RTC**

A hybrid program design combines an ETC with a low-guarantee RTC (ETC-RTC), thus offering ES and IM features in a single program. A proposed prototype for this design applies the subsidy rate for all earnings from the first dollar, unlike the standard ETC.<sup>28</sup> Figure 5 depicts this hybrid scheme with a low guarantee (G), subsidy rate (s) applying to all earnings from zero up to threshold  $T_2$ , a flat level of subsidy for earnings between  $T_2$  and  $T_3$ , and higher earnings subject to phase-out rate  $r$  until the break-even income  $B$  is reached.<sup>29</sup> This format is designed mainly for employable persons; with its guarantee well below the poverty line, they can be expected to at least approach poverty thresholds by working a limited number of hours at the minimum wage. Since this format does not provide a guarantee that alone would approach poverty thresholds, it requires the use of categorical treatment to provide less employable persons an adequate guarantee via a transfer format of the IM variety.<sup>30</sup>

### **Wage Rate Subsidy**

The wage rate subsidy (WRS) provides a subsidy for each hour of work supplied by the beneficiary. The subsidy rate is inversely related to the individual's market wage rate;<sup>31</sup> thus it has no break-even income per se but rather a break-even wage rate ( $w^*$ ). Workers with wage rates below  $w^*$  are subsidized by part of the shortfall between  $w^*$  and their actual wage rate. For example, assume that  $w^*$  is set at \$16 per hour and that 50% of the shortfall is provided as an hourly subsidy. In this example, a worker earning \$12 per hour would receive a subsidy of \$2 per hour ( $0.5 \times (\$16 - \$12)$ ). Figure 6 portrays the net subsidy as a function of hours worked by individuals with a lower wage rate  $w_2$  and a higher wage rate  $w_1$ , both lying below the break-even wage rate  $w^*$ . A WRS can also be structured with a floor or ceiling on a worker's subsidized hours per period. Since the current system of income reporting for taxation purposes includes only total earnings, and not how earnings are constituted between hours worked and wage rate, the WRS would require additional reporting from employers to the agency administering the program (possibly the tax department). This new informational burden of a WRS is one reason that governments have typically preferred to implement the ETC format.

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<sup>27</sup> The Earned Income Supplement vanished with implementation of the National Child Benefit initiative in 1998 and was reincarnated as the Working Income Tax Benefit in 2007.

<sup>28</sup> This hybrid format was proposed by Koebel and Pohler (2019). Their suggested design would draw on financing by abolishing the basic personal amounts in federal and provincial income taxes, so that all earnings from the first dollar would be exposed to first-bracket tax rates. They would offset these rates by raising the subsidy rate, so that rate  $s$  would be net of those tax rates.

<sup>29</sup> For this format the break-even level becomes  $B = T_3 + (G + sT_2)/r$ .

<sup>30</sup> Analysts proposing categorical application of IM and ES formats based on the individual's employability include Kesselman (1968, 1973b); Zeckhauser and Schuck (1970); Zeckhauser (1971); and Akerlof (1978).

<sup>31</sup> Unlike the ETC format with its fixed subsidy rate  $s$  over the supplemented range of earnings, the WRS offers an hourly subsidy rate that is inversely related to the worker's market wage rate.

## **Additional Design Choices**

### **Beneficiary Unit, Eligibility, and Aggregation**

Another key design choice for each program type is whether the beneficiary unit should be the individual, the couple, the family, or some other concept. Most IM and ES programs have chosen the couple or family as the beneficiary unit, although this is not essential. Use of the family unit means that the incomes of two spouses are aggregated in assessing eligibility (i.e., whether their joint income is less than break-even income). Similarly, in determining their net benefit the tax-back rate is applied to their combined income. As a result a lower-income spouse partnered with a high-income spouse may be disqualified for benefits, whereas that spouse could qualify for benefits if the system operated with the individual as the unit. Thus, with family as the benefit unit, the income aggregation may pose disincentives for marital formation or stability or at least incentives for fraudulently misreporting of relationships. With programs of the ES variety, further choices involving the unit are whether each spouse is eligible for benefits, joint earnings are reckoned in the benefit formula, or just one spouse of a couple is eligible for benefits. This choice could also have effects on incentives for family formation or dissolution.

### **Scaling of Guarantee for Family Size**

Yet another key design choice is how to adjust the size of benefits for units of varying size if the chosen unit is larger than the individual. Families can achieve scale economies in many aspects of their living costs such as housing, appliances, and food. A family of two persons does not need twice the income of a single person to achieve the same real living standard. An income-transfer program could allow those economies to be reaped by persons who live together, but most transfer programs scale their benefits to reflect the economies. A widely used adjustment is to divide the number of persons in the family by its square root. Thus, a family of two persons would be given a guarantee of 141% times the guarantee for a single person (the square root of 2 is 1.41). Other scaling approaches place a smaller weight on the children than adults in the family. Similar to income testing benefits based on family income, scaling benefits to reflect these economies can pose incentives for family fragmentation or fraudulent reporting.

### **Other Considerations in Benefit Size**

Two other types of considerations can enter into setting the size of benefits for an income-transfer program. The first is differentials in local or regional living costs faced by various beneficiaries. Whether the guarantee (or other program parameters) should be adjusted for higher or lower living cost is a policy choice related to both equity concerns and incentive effects. Paying higher benefits to beneficiaries in higher-cost areas may be deemed equitable, but it might also deter economically efficient moves of persons to lower-cost locales. Related to this policy decision are values about whether individuals should be supported to remain in their original locales even if this entails higher public costs. This type of benefit differentiation is

relatively simple to implement in a program, although issues of confirming actual versus claimed place of residence may arise.

The second type of consideration is the differential needs by individuals based on their particular characteristics, which may change over time or episodically. Relevant factors could include special medical or dietary needs and one-time costs such as home or appliance repair. The welfare system is rife with such allowances, which are often dispensed by a caseworker familiar with the beneficiary's situation. Given that these special needs vary across individuals and time, they cannot be integrated into a general benefit formula for an income-transfer program. Thus, major reform of income security along the lines of a UBI, RTC, or NIT faces a hard choice in program design: (a) simplify program administration by eliminating these special allowances; (b) incorporate the value of the allowances into a higher general cash benefit level for the new program; or (c) retain a parallel administration tasked with continued assessment and provision of special allowances to beneficiaries demonstrating need.<sup>32</sup> The most salient issue of differential needs arises with disabilities; as noted previously, this issue has major implications for the choice between IM and ES formats and whether to apply categorical treatment.

### **Measure of Income**

In addition to the issue of aggregating a family's income for a transfer program's tax-back, there is the matter of choosing the income measure; this typically draws on the personal tax system.<sup>33</sup> It can be either income net of income tax or prior to netting out income tax; the latter choice compounds the person's income tax rate with the tax-back rate. The income measure for a transfer program can further consider family size or single versus couple status by deductions for the couple. A program could also set differential thresholds for the tax-back on singles versus couples; this would recognize that a smaller family can achieve the same living standard at a lower income than a counterpart larger family. Deductions from income can also be allowed for particular necessary expenses that only some members of the beneficiary group require, so as to enhance equitable treatment. In view of its self-reported nature, the income of the self-employed poses special problems of both measurement and verification of the amounts and timing of receipts and expenses.<sup>34</sup>

### **Role of Assets**

Most financial and business assets apart from tax-favoured savings generate incomes that are reported for tax purposes, and they similarly can be subjected to any income tests and tax-backs embodied in the income-transfer system. However, IA programs additionally apply

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<sup>32</sup> A subsection of the final section of this study pursues this issue further.

<sup>33</sup> Benefits from welfare and Guaranteed Income Supplement are both subject to steep income tests and thus are excluded from taxable income in the Canadian personal tax system.

<sup>34</sup> Special issues arising in the treatment of self-employment income for an income maintenance program include the treatment of depreciation and capital gains, cash versus accrual accounting, and possible attribution of income to net worth. See Bawden (1973) and for the U.S. rural income maintenance experiments see Bawden and Harrar (1978) and Kershaw (1978).

asset tests as part of their eligibility criteria; these use complex definitions of includable/excludable assets and a strict cut-off for assets exceeding a threshold. The largest exception for both taxes and transfers is wealth held in the form of home equity, which yields tax-free benefits in the form of accommodation services that would otherwise have to be purchased in the rental market. For beneficiaries with the same income but differing in home ownership, equitable treatment might require some form of asset testing. One approach would be to impute an income to the beneficiary's home equity net of any associated debt. A simpler albeit cruder method would be to apply differential benefit tax-back thresholds or rates based on whether the beneficiary owns a home of any value.<sup>35</sup>

### **Universal, Categorical, or Conditional Treatment**

The benefits of an income-transfer program can be structured for distribution universally, categorically, and/or conditionally. A “universal” program is one that does not impose an income test on beneficiaries, so that the same level of benefits is paid irrespective of income. However, any transfer program including a universal one can impose categories receiving different levels of benefits. These “categorical” distinctions include relatively fixed and easily verifiable characteristics such as age and family size. Thus, a UBI may offer different levels of benefits for children, working-age adults, seniors, and persons with major permanent disabilities. In contrast, a “conditional” transfer program imposes eligibility conditions and/or differential benefit levels based on a person's behaviour such as employment, training, studying, volunteering, or caring for needy dependants. The distinction between categorical and conditional attributes thus relates to the degree of fixity versus behavioural discretion. Some attributes such as marital status and locale of residence are relatively fixed in the short run but more responsive to incentives over longer periods, such that they may be regarded as either categorical or conditional depending on the time horizon and policy purpose. Clearly, a transfer program can have both categorical and conditional aspects to its structure.

As explained in my later analysis of the economic attributes of the transfer formats, introducing categorical and/or conditional aspects into the eligibility and benefit provisions for transfer programs offers important economic gains. Such provisions also bolster public support for programs, since they accord with popular notions of relative need and reciprocity.<sup>36</sup> However, these kinds of provisions carry potential costs of several kinds. The extent of these costs ranges from minimal (for example with an age criterion) to significant (such as with an employability criterion). First are the burdens for program administration and public comprehension and compliance. Second is the potential for stigma associated with application for or participation in a program. Related to the first two factors is another consideration: the possible adverse impacts on take-up and enrolment by the program's target population. Finally,

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<sup>35</sup> One variant of this approach is the Australian Age Pension, which reduces the payable pension by a percentage of non-housing assets above a threshold that is lower for homeowners than non-homeowners. The system thus assumes a specific market value for the home of an owner.

<sup>36</sup> Transfer schemes of the ETC format have been particularly popular in the United States and Canada. See the evidence in Hotz and Scholz (2003); Nichols and Rothstein (2016); and Gillezeau and Speer (2016).

more complex eligibility and benefit criteria raise the risk of classification errors of program applicants—both false acceptance and false rejection errors—as explained in the next subsection.

### **Application, Enrolment, and Classification Errors**

Eligibility of an individual or family for the benefits of a cash-transfer program can be established through either auto-enrolment or self-initiated application. The auto-enrolment method is best suited for programs with relatively simple eligibility criteria, such as age, family size, and income. It can be implemented through the income tax system based on the annual filing of returns. Within limits, more complex criteria such as disability can also be operated via the tax system, such as Canada’s Disability Tax Credit that uses a self-initiated claim but also requires a medical practitioner’s assessment and certification. One advantage of using tax-based auto-enrolment is the high proportion of individuals who file returns, either to secure tax refunds or to access refundable tax credits or other tax-based transfer benefits. The UBI format as well as an unconditional RTC, NIT, or ETC would be well suited for auto-enrolment via the tax system.<sup>37</sup> However, some highly vulnerable and isolated individuals including the homeless do not file tax returns and thus would need to be enrolled through an outreach campaign.

The principal alternative to auto-enrolment is self-initiated application lodged by prospective beneficiaries. The efficacy of this method is highly dependent upon publicity to make potential beneficiaries aware of the program and the application procedure. This method is also likely to miss many of the most vulnerable and most needy persons who would be eligible if they were to lodge applications. Both methods of enrolment but particularly self-enrolment for programs with more complex eligibility criteria are subject to classification errors. Two types of errors can arise.<sup>38</sup> First, an applicant who does satisfy the eligibility criteria may nevertheless be rejected in their claim. The reasons for these “rejection errors” are varied: inadequate documentation, not completing forms fully or correctly, lack of follow-through, or simply bureaucratic error. The second kind of error arises where an applicant is lacking in one or more of the eligibility criteria but nevertheless is accepted in their claim. The reasons for these “acceptance errors” are also varied: providing false information, forged documentation, failure to adequately verify the applicant’s submission, slack administration, and bureaucratic error.

The cited classification errors parallel standard concepts in statistical analysis.<sup>39</sup> Table 3 displays all the possible outcomes for applicants to a program. Two more statistical concepts shown in the table are useful in guiding policy design. “Specificity” is the proportion of all

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<sup>37</sup> As of 2019 the Canada Workers Benefit (an ETC) was shifting from self-initiated application to auto-enrolment for individuals filing a tax return.

<sup>38</sup> See Duclos (1995) and Giovanni and Stewart (1995) for application of these concepts to errors of eligibility for social programs.

<sup>39</sup> These concepts are used in statistical testing of hypotheses using a “null” hypothesis that is either “rejected” or “not rejected” (i.e., accepted) based on a data sample. Here I apply these concepts to an illustrative individual making claim for program benefits; these concepts are typically applied to a sample population rather than an individual (see Table 3).

claimants who satisfy a program's eligibility criteria *and* are approved; one major goal of program design is to maximize its specificity. Conversely, "sensitivity" is the proportion of all claimants who lack the criteria for eligibility and have their claims rejected; a program design should seek to maximize its sensitivity. However, those two goals are typically at odds with each other. Designing more stringent eligibility criteria and application processes to weed out ineligible claimants entails more complex and arduous steps and thus will be adverse as well to the prospects of more vulnerable, less literate, poorer claimants who in fact do possess the requisite criteria.

In programs that rely on self-enrolment, a trade-off between the two types of classification errors is unavoidable, and similarly maximizing specificity comes at the cost of reducing sensitivity. Moreover, increasing the stringency of a program's eligibility criteria and application process will unavoidably deter some members of the target group from even applying for benefits. This discouragement can arise because of the perceived costs in terms of comprehension, documentation, time, money, travel, and stigma—or simply the perception that the odds of approval are low. These factors can explain the low take-up rates that arise for some programs—such as where the costs of applying are high relative to the anticipated benefits. These considerations are important in the design of eligibility criteria, application processes, and publicity for both cash-transfer and in-kind benefit programs.<sup>40</sup> Classification errors can be problematic in income-transfer programs that make sharp distinctions in eligibility or benefit levels based on employability, which in fact is often a continuous rather than discrete attribute.

## **Economic Attributes of the Formats**

### **Targeting, Poverty, and Cost**

Key concerns in the design of any income-transfer program include the effective targeting of benefits to combat poverty and the associated budgetary cost and incentive effects. In these respects the UBI format performs the worst of any program design, although it may fulfill other objectives of advocates such as simplicity, a notion of "freedom," and absence of stigma. Researchers assessing this format as a potential replacement for existing income support systems in several countries concluded:

A [Universal] BI would fix benefit coverage gaps that exist in many countries, but would require very substantial tax rises if it were to be set at a meaningful level. As support would not be targeted on those most in need, it would not be a cost-effective way of directly reducing income poverty (Browne and Immervoll 2017, 326).

To conserve on program cost and target benefits more effectively for persons at the lowest incomes, some form of income testing using a tax-back rate is applied in the RCT and NIT formats. The trade-offs among targeting, incentives, and cost are explored in the next subsection. To increase the targeting effectiveness for any given cost, an IM program can utilize

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<sup>40</sup> For a survey of the determinants of social program take-up, see Currie (2006).

categorization to provide differentially higher benefits to persons having attributes with the greatest need; the logic and mechanics of this approach are also presented there.

If categorization on the basis of employability is feasible and deemed acceptable, income-transfer programs can reserve high IM benefits for those with the greatest barriers to work, such as disabilities. The more employable population can then be given lower IM benefits and access to ES benefits. The latter are tied to earnings, so that by incenting self-generation of income by beneficiaries their anti-poverty efficacy is maximized. In contrast, IM programs with tax-back rates that discourage earnings have to work double time—both filling the initial income shortfalls and offsetting the reduced earnings. Other methods of targeting support for the poor can address particular needs such as housing and health care. Thereby, they reduce the amount of income transfers required to raise the living standards of beneficiaries, and this approach has unique aspects that go beyond the current analysis of cash transfer programs.<sup>41</sup>

### Trade-Offs for Income Maintenance Programs

Income-transfer programs face a trade-off among key policy objectives that imply a need for compromise. This trade-off affects both IM and ES types of programs, but it can be presented most clearly and simply for IM programs of the NIT and RTC varieties. Each of the key program parameters can be associated with a primary program objective:

G, the guarantee level, is associated with *adequacy* (higher is better for poverty reduction)

r, the benefit tax-back rate, is associated with *incentives* (lower is better for reduced disincentives)

B, the break-even income, is associated with program *cost* since it is related to fraction of population receiving net benefits (lower is better for reduced cost)

For each parameter, “better” is assessed ignoring the implied impacts on the other parameters.

The parameters are connected by the relationship:  $B = G/r$ , as stated earlier.

Because of the mathematical relationship among the three parameters of an IM program, one can freely vary only two of them; the value of the third parameter is then constrained by the relationship. For example, assume initial values of B, G, and r; then seek an increase in program adequacy (to G') without increasing program cost. This variation can be achieved only by increasing the phase-out rate (to r'), which necessitates a reduction in the break-even income level (to B'). Figure 7 depicts this trade-off, where the additional benefits for low-income beneficiaries (area Y) must be offset by the reduced benefits for previous higher-income beneficiaries (area Z).<sup>42</sup> Individuals with incomes below X gain, while those with higher incomes lose. As a result, the relationship and the figure show that the phase-out rate must be

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<sup>41</sup> For analysis and assessment of in-kind benefits, see Kesselman and Mendelson (2020).

<sup>42</sup> More accurately, the amount saved from reduced payments at upper incomes must equal the amount added as increased payments, which will not mean equal areas on account of the differing numbers of households at the various income levels.

increased to  $r'$ . Table 4 shows further how program adequacy, incentives, and cost face unavoidable policy trade-offs.<sup>43</sup>

Further insight into the severity of the policy constraints for IM programs derives from their interactions with the distribution of income. To illustrate this problem, we begin with an IA program having  $G = \$10,000$  (half the poverty threshold and higher than IA benefits for employable single persons) and  $r = 1$ . Raising the guarantee level for greater adequacy and/or reducing the tax-back rate for better incentives increases the break-even income (from  $B = \$10,000$ ) to include denser parts of the income distribution. Even though the persons additionally being covered may individually receive modest amounts of net benefits, their larger numbers exerts major impacts on the overall program cost. The critical nature of the issue is illustrated in Figures 8 and 9, which utilize population income distribution (PID) curves that show the number of persons at each income level.<sup>44</sup> The cost of a program for those at income  $I_j$  is the product of the net benefit per person at that income (vertical green line) multiplied by the number of such persons (vertical red line). A program's total cost is the sum of its total net benefits at each income level for all incomes from zero up to the program break-even income.

Figure 8 begins with the cited IA program to show how program caseload and budgetary cost escalate sharply with reforms that move from IA toward an unconditional NIT or RTC.<sup>45</sup> At a low income such as  $I_1$  relatively few persons are receiving net benefits, and most get near the IA program's maximum ( $G$ ).<sup>46</sup> Next consider reforms that move the program toward a RTC or NIT with double the guarantee ( $G' = 2G$  or  $\$20,000$ ) for full adequacy at the poverty threshold and a tax-back rate of 50% to avoid severe disincentives for the newly entitled beneficiaries. The break-even income is then  $B' (= 2G/0.5 = 4G$  or  $\$40,000$  per person), which extends to twice the poverty threshold and covers a large share of the working population. The net benefit for each person with  $I_1$  roughly doubles (dashed green line at that income), but the more dramatic impact on cost and number of beneficiaries arises because of the increased break-even income level. Net benefits are now payable to persons with incomes up to  $B'$ , such as those at income  $I_2$  who because of their larger numbers receive in aggregate more (product of vertical red line and solid green line at  $I_2$ ) than those at low income  $I_1$ . Concern over disincentives now facing the primary working population could motivate further reducing the tax-back rate to 0.4.<sup>47</sup> This reform raises the break-even to  $B''$ , which in our example is  $\$50,000$  or

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<sup>43</sup> Petit and Kesselman (2020a, 2020b) similarly explore the trade-offs among the program parameters of an ES scheme, which are more complex on account of their greater number.

<sup>44</sup> This presentation draws on more formal concepts of statistical distributions, where at any given income the curve would represent the *frequency* rather than the actual numbers of such persons in the observed population. The text's simplified account eases exposition for nontechnical readers.

<sup>45</sup> My discussion does not consider the various eligibility conditions besides income that further limit access to real-world IA programs.

<sup>46</sup> Limited earnings of beneficiaries is partially the result of the program's severe disincentives without any exemption provisions. The current presentation including the PID curves ignore behavioural responses to the various program reforms.

<sup>47</sup> We need to be mindful that beneficiaries also face the marginal rates of income and payroll taxes need to finance

in excess of median per capita income. Thus, while the net benefits paid to each person at incomes far above poverty, such as  $I_3$ , are relatively modest, their numbers are large, which significantly inflates program cost.

The strong trade-off among an IM program's key objectives can be moderated by categorical treatment of beneficiaries—an approach called *tagging*.<sup>48</sup> Figure 9 depicts this situation with distinct population income distribution curves: PID for the full population,  $PID_n$  for the non-targeted group, and  $PID_t$  for the targeted group.<sup>49</sup> Groups with limited ability to work such as severe disability can be targeted in an IM program with high guarantee levels and tax-back rates. The resulting low break-even income targets the benefits on groups that have unusually low incomes and are deemed to be most needy; it also controls the budgetary cost and focuses the strongest disincentives on those with limited work capacity. Fully employable persons are provided an IM program with lower guarantees and tax-back rates combined with access to ES benefits.<sup>50</sup>

### Work Incentives of IM Versus ES Formats

A topic of major interest in the design of income-transfer programs is their effects on beneficiaries' incentives in the labour market. Key aspects include choices regarding whether to engage in paid work, hours of work, job and occupation, self-employment, education, training, and skill upgrading. Economic analysis has focused on the "static" incentives of whether and how much to work in the formal labour market. Here I focus on the two basic formats for the IM and ES, which are the NIT and WRS, respectively. Although the ETC is used in practice far more than the WRS, the simpler analysis of the latter covers the phase-in range of the ETC. The two formats differ in that the ETC's phase-in rate is constant, while the subsidy rate of the WRS is inverse to the individual's market wage rate, but this does not affect the comparative analytics. The ETC's phase-out or tax-back imposes work disincentives similar to that of the NIT for individuals in that earnings range; the WRS format does not suffer from that deficiency.<sup>51</sup>

A key difference in static incentives between the two formats is that the WRS (and the ETC) provide no guarantee for individuals who do not work; thus, they cannot induce individuals who originally work to stop working. In contrast, the NIT's offer of a guarantee amount at zero

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general government spending in addition to IM tax-back rates.

<sup>48</sup> This term and the associated economic analysis were introduced by Akerlof (1978); also see the analysis in Kesselman (1982, 243–44, 276–78) and Hamilton (2010).

<sup>49</sup> The illustrative incomes in the figure have a second subscript: t for targeted and n for non-targeted groups. Members of the two groups are subject to the different program budget lines.

<sup>50</sup> The programs shown in Figure 9 provide the targeted group a guarantee  $G_t$  ( $= 2G_n$  or \$20,000), tax-back rate 0.8, and break-even income  $B_t$  ( $= 2.5G_n$  or \$25,000), while the non-targeted group has  $G_n$  of \$10,000 and tax-back rate 0.5 with break-even income  $B_n = 2G_n$  ( $= \$20,000$ ).

<sup>51</sup> Clavet, Duclos, and Lacroix (2013) simulate the effects and costs in Quebec of hypothetical programs of the NIT and WRS (with \$3 per hour subsidy and requiring 16 hours work per week) formats. They conclude, "If the intention of policy-makers is to help individuals exit poverty, an efficient policy, from our model's perspective, would be to provide inactive individuals a wage subsidy, not an unconditional income transfer. There is considerable mounting evidence on the efficacy of such policies in Canada and elsewhere" (512).

earnings can induce some individuals to stop working. Of individuals who work and continue to work with either the NIT or WRS, the two formats also have differing incentive effects. For programs of the two formats with comparable amount of transfers, the NIT induces a smaller amount of work hours than the WRS. The WRS can raise an individual to a higher level of utility than the NIT for a given amount of transfer, or conversely, the WRS can achieve the same level of worker utility as the NIT with a smaller transfer. Similarly, the WRS can lift the worker to the same level of post-subsidy income as the NIT at lower budgetary cost.<sup>52</sup> Note that requiring at least  $H^*$  work hours in the NIT-WR format can induce some individuals to move into the labour force. However, individuals already working more than  $H^*$  hours and earning below break-even will face the NIT's normal disincentives on work hours.

The various transfer formats also differ in their incentives for skill upgrading and associated increases in beneficiaries' wage rates. The WRS variant of the ES format clearly imposes a disincentive for any activities that increase wage rate, since the hourly rate of subsidy is inversely related. The NIT format similarly poses a disincentive for efforts to increase wage rates, since its tax-back rate applies equally to both higher wage rates and increased work hours. Effects of the ETC format on incentives for increasing wage rates are more nuanced: positive in the subsidized range of earnings, neutral in the flat benefit range, and (similar to the NIT) negative in the tax-back range. The positive inducement for ETC beneficiaries to enter or remain in the labour force should yield temporal wage rate increases through on-the-job learning, work experience, habit formation, and social connections. Yet, none of these predicted superior dynamic effects of the ES genre relative to the IM genre has been systematically assessed.

Economic analysis using optimal taxation theory has also been applied to assess income-transfer formats; this approach balances distributional gains against efficiency losses. The comparisons have set the pure non-categorical format against formats with little or no guarantee at zero income but positive subsidy on earnings. The latter include the ETC, WRS, and NIT-WR. The most-cited study finds the NIT optimal if workers' hours (the "intensive margin") are more responsive, while the ETC is optimal if individuals are more responsive in their labour force participation (the "extensive margin").<sup>53</sup> Other studies have also assessed transfer formats in an optimal tax framework using varied assumptions.<sup>54</sup> Several such studies conclude that an NIT with a work requirement or categorical treatment combined with an ETC or WRS yields superior outcomes in efficiency and redistribution relative to a pure, non-categorical NIT.<sup>55 56</sup>

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<sup>52</sup> These results on the comparative static results draw on Kesselman (1969, 1971, 1973a) and Barth and Greenberg (1971) for analysis of the NIT-WR as well as the WRS with a floor on subsidized hours.

<sup>53</sup> See Saez (2002), which does not consider other dimensions of the problem such as dynamic or compliance responses, factors that generally favour ES formats over IM formats.

<sup>54</sup> For a recent extensive review of the literature, see Boadway and Cuff (2020).

<sup>55</sup> See Kesselman (1976, 1977); Besley and Coate (1992, 1995); Ravallion and Datt (1995); Brett (1998); Cuff (2000); Beaudry, Blackorby, and Szalay (2009); Hamilton (2010); and Ravallion (2018).

<sup>56</sup> Akerlof's analysis of "tagging" is also relevant to this issue. See the applications in Parsons (1996); Immonen et

## Compliance and Reporting Incentives

The various income-transfer formats differ in terms of incentives for beneficiary compliance and income reporting. Depending on the benefit structure and definition of the benefit unit, a format may be relatively favourable or averse to reporting of the true marital or cohabitation status (as noted earlier). Under most of the IM formats, honest reporting of earnings and other income is discouraged by the tax-back rate. While the UBI is paid without tax-back, its costly finance necessitates increases in various tax rates, and these invoke incentive issues similar to those of other IM formats.<sup>57</sup> Three sources of labour earnings need to be distinguished: employment in the compliant sector, paid work in the non-compliant sector, and self-employment. Work in the compliant sector of the economy has employers reporting individual earnings to the tax and transfer authorities, so that a beneficiary cannot easily escape the tax-back on benefits. In order to reduce or escape this benefit reduction from working, the beneficiary has an incentive to shift work into the non-compliant, irregular sector or into self-employment. Both of those options provide much greater opportunity for fraudulent under- or non-reporting of earnings.

An incentive for non-compliance by under-reporting earnings arises with both the RTC and NIT formats. However, the significant delays in the response of benefits to recent earnings under the RTC may obscure the connection and blunt this disincentive effect. With its relatively frequent income report form, the NIT's response of benefits to earnings variations is much faster, which could carry greater incentives for under-reporting. The addition of a work requirement to an NIT could act to overcome the format's disincentives for full income reporting, since the beneficiary must document that they have met a threshold level of work activity; normally this would require the periodic submission of employer pay stubs. Self-employment poses difficulties for any of these transfer formats, since it affords the worker great discretion in the timing of income and expenses as well as the potential to conceal receipts via cash payments.<sup>58</sup>

Transfer programs of the ES genre are much more likely to induce full reporting of work and earnings because their benefits are tied positively to those outcomes. The ETC format in particular will encourage reporting of earnings that fall within the range that receives a subsidy; its incentives for additional earnings in the flat benefit range are at least neutral, unlike the NIT's disincentives for work and reporting in the counterpart range. Once the beneficiary's earnings rise into the phase-out range of an ETC, there is a disincentive for full reporting; a worker can achieve this by taking one compliant job that yields earnings in the subsidized or flat range and making any additional earnings in non-compliant work or concealed self-employment. The WRS format poses an incentive for workers in collusion with their employers to report full earnings

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al. (1998); Boadway and Cuff (1999); and Cremer, Gahvari, and Lozachmeur (2010).

<sup>57</sup> However, depending on how the additional revenues are raised, they may fall relatively lightly on incomes below the program's break-even.

<sup>58</sup> Self-employed beneficiaries were reported to pose major problems in administration of the Self-Sufficiency Project. One of the U.S. NIT experiments concentrated on a rural community with many self-employed farmers; for the attendant administrative issues, see Bawden (1973).

while overstating actual hours and understating the actual wage rate. However, this form of fraud is unlikely to arise with larger employers, and it is uncertain how likely it is to occur at all.<sup>59</sup>

## Empirical Impacts of the Formats

### Empirical Evidence on Work Incentives of NIT

Substantial empirical and quantitative analysis has been undertaken to assess the work incentive effects of the IM format of income-transfer programs. These studies have focused on the NIT/RTC structure, which offers a guarantee amount for recipients with zero income and applies a tax-back rate to target net benefits at lower incomes. The associated income and substitution effects are predicted to reduce labour force participation and hours of work.<sup>60</sup> Although the postulated benefit structure might supplant more severe tax-back rates for persons who are currently on welfare, the break-even income levels extend much higher up the income scale, thus exposing far more workers to disincentive effects than those under the welfare system. Here I briefly summarize the key findings on the static labour incentive effects of an NIT based on the major experiments undertaken in the U.S. and Canada.<sup>61</sup> I next review the implications of the NIT disincentives for the budgetary cost of the program. All of these estimates ignore the potential impacts on market wage rates of workers who receive NIT benefits, a topic to which I return later. I also catalogue some of the limitations inherent in estimates of work disincentives based on the NIT experiments.

The labour supply impacts of an NIT hinge on the preferences and constraints of various individuals and thus their desire and ability to vary labour participation and work hours. As revealed in the estimates from the four U.S. and one Canadian NIT experiments of the late 1960s through 1970s, the responses vary across groups based on marital status, sex, and presence of children. The estimated reductions in total hours of work including participation effects from the U.S. NIT experiments averaged 6% for husbands, 19% for wives, and 15% for single mothers. The estimated decline in work hours in the Manitoba Mincome program were considerably smaller, at 1%, 3%, and 7% for the three groups, respectively.<sup>62</sup> A later analysis of

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<sup>59</sup> This type of potential fraud under a WRS was first assessed by Kesselman (1968, 11–13).

<sup>60</sup> The NIT-WR format is predicted to induce some non-workers to enter the labour force, which was confirmed in the Canadian Self-Sufficiency Project. However, that project was limited in generalizability, as it was restricted to long-term welfare beneficiaries. See Michalopoulos et al. (2002) and Ford et al. (2003).

<sup>61</sup> Estimates of labour responses to an NIT have also been undertaken based on econometric studies from cross-sectional survey data, which relies on natural variations. For discussion and comparative assessment of the estimates, see Hall (1975) and Burtless (1986). See Simpson (2020) for extensive review of the design, operation, and assessment of past and ongoing NIT experiments and pilot projects; Riddell and Riddell (2020) offer re-estimates for Mincome.

<sup>62</sup> These summary estimates are averages taken from Hum and Simpson (1993, S279; also see Widerquist 2005, 62) and reflect the combined effects on participation and hours. Negative estimates for the U.S. experiments varied across site and study from a low of 1% to a high of 9% for husbands, a low of 3% to a high of 33% for wives, and a low of 9% to a high of 30% for single mothers. The negative 1% figure cited for Mincome included husbands and single men. Note that some of the point estimates reported here were not statistically significant. Calnitsky and Latner (2017) estimate a much larger 11.3 percentage point reduction in total labour participation rates for Mincome's saturation site.

the Canadian Universal Child Care Benefit, a form of UBI for parents with primarily an income effect, found a negative impact on the labour supply of married women. The adverse impact was most notable for the work hours and participation rates of lower-educated mothers but was also significant albeit small for men.<sup>63</sup>

The estimated adverse impacts of an NIT on labour supply have significant implications for the budgetary cost of a real-world program of similar design. Begin with an estimate of the budgetary cost of a NIT with specified parameters (guarantee levels, tax-back rates, eligibility) based on a simulation of a specified population assuming no labour supply impacts and no impacts on market wage rates. The additional program cost attributable to the NIT's work disincentives will vary depending on the choice of labour-supply estimate.<sup>64</sup> The implied incremental program cost ranges from as low as 5%–10% with one estimate to 30%–122% under another estimate.<sup>65</sup> These estimates also fail to consider potential under- or non-reporting of earnings with an NIT imposing tax-back rates in the range of 30%–50%. Combined with various tax rates and the tax-back rates imposed by other income-tested cash and in-kind benefit programs, total marginal effective tax rates (METRs) can exceed 75% for some beneficiaries. At that METR, an individual earning \$14 per hour will retain only \$3.50 at the margin, thus stimulating evasion and underground activity. Since NIT experiments did not include all these taxes nor the effects of additional taxes that would be needed to finance the scheme, even the cited figures may understate the potential program cost.

The NIT experiments have been widely cited for their findings of limited impacts on the paid work effort of program participants other than wives and single mothers. However, the experiments are seriously limited in their utility for projecting the long-run impacts on work behaviour and the cost of a real-world, fully financed scheme.<sup>66</sup> Already cited is the potential adverse impact of very high METRs on various incentives, making hazardous any extrapolations from empirically estimated behavioural responses. Other issues affecting projections based on the NIT experimental results include: (a) the failure to reflect the increased taxes needed to finance the program, which will affect some beneficiaries as well as non-beneficiaries over a wide range of earnings; (b) the sample approach to experimentation, which masks the effects on social norms that can arise when all lower-income individuals are

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<sup>63</sup> See Schirle (2015). The Universal Child Care Benefit (UCCB) was paid as flat demogrant to eligible parents without any income test, but it was deemed taxable income to the lower-income spouse. Since this taxability would only occasionally push the recipient into a higher tax bracket, the UCCB exerted almost entirely a pure income effect like an unconditional UBI. Also see Koebel and Schirle (2016) for estimates of the differential labour supply impacts of UCCB on married and single mothers.

<sup>64</sup> Offset against the reduced labour supply could be an upward impact on market wage rates of lower-skilled labour, which would tend to reduce program cost; I discuss this factor later.

<sup>65</sup> Widerquist (2005, 63), who also cites the Burtless (1986) study as implying a near tripling of the NIT program cost due to labour supply effects.

<sup>66</sup> Most of these limitations have been cited and assessed by others; see Aaron (1975b), studies in Pechman and Timpane (1975), Rossi and Lyall (1976, chap. 9), studies in Munnell (1986); Anderson and Block (1993); Widerquist (2005); Simpson, Mason, and Godwin (2017); and Mendelson (2019).

eligible<sup>67</sup>; and (c) most critically, the short-term nature of the experiments.<sup>68</sup> One experiment used a saturation site and found that about one-third of the 11.3 percentage point reduction in labour participation was attributable to an interactive community effect.<sup>69</sup> Durations of a few years fail to reveal longer-run impacts on social norms and work habits or changes that workers would contemplate with a permanent program.<sup>70</sup> Limited duration and dispersed sampling also obscure institutional changes that might arise with a permanent program, such as employers reducing standard work hours or shifting pay toward untaxed fringe benefits.

### **Empirical Evidence on Work Incentives of ETC**

For empirical analysis based on actual programs, the U.S. experience with an ETC program (termed the Earned Income Tax Credit or EITC) is most informative. The EITC has grown to be the primary form of cash transfer to low earners in the United States, displacing more traditional welfare programs. Analysis of the labour-related effects of the EITC is far more reliable than for the income maintenance experiments, since it avoids the cited limitations for the experiments. The EITC has operated for nearly 45 years (since its inauguration in 1975) and has applied to the full eligible population, thus avoiding issues of limited duration, sampling, attrition, and the lack of aggregate effects on labour markets and institutions and worker norms. In addition to changes over time in the federal EITC, nearly 30 states have introduced parallel provisions over the years, yielding significant variations that aid statistical analysis.<sup>71</sup> Since the program has been fully financed by foregone tax revenues, however, one cannot readily trace the effects of related program financing (about U.S.\$70 billion in 2019 for the federal government).<sup>72</sup>

As shown earlier, the predicted effects of the EITC are: (a) in the subsidy range of earnings, a substitution effect inducing some persons who were not working to enter or rejoin the labour force; (b) in the flat benefit range of earnings, a pure income effect, possibly reducing hours for workers;<sup>73</sup> and (c) in the benefit phase-out range of earnings, discouraging work hours

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<sup>67</sup> Most of the experiments selected initial samples that excluded households with incomes well above their break-even levels, thus omitting persons with income variations who would become eligible for benefits in subsequent periods under a real-world program. Note also the potential positive impacts on wage rates when all lower-wage workers are eligible for NIT.

<sup>68</sup> One economist critically assessing the U.S. trials stated, “Even if all the other problems were overcome, I would still be skeptical of interpreting the results of the experiment as permanent responses. ... The net effect of a permanent negative income tax plan on lifetime wealth is of a totally different order of magnitude for low-income families than the corresponding effect for a three-year program” (Boskin 1975, 111).

<sup>69</sup> This was observed in the Dauphin site of Mincome. See Calnitsky and Latner (2017).

<sup>70</sup> See the general discussion of these issues in Lindbeck (1995).

<sup>71</sup> Most state EITCs are structured as a percentage of the claimant’s federal EITC entitlement.

<sup>72</sup> Ackerman and Cooper (2019, 12, Table 3). Note that 84% of benefits are paid to families with adjusted gross incomes of U.S.\$30,000 or less. In addition, the U.S. has a federal provision of Child Tax Credit, which is partly structured similar to the EITC but only partially refundable, though its benefits extend to much higher family incomes. See Hoynes and Rothstein (2017).

<sup>73</sup> Even in its flat-benefit range, the ES format should be less adverse to work effort than the NIT because it exerts only an income effect and not additionally the substitution effect of an NIT. See Garfinkel (1973) for comparative assessment of WRS and NIT with respect to training incentives.

based on income and substitution effects analogous to an NIT. Extensive analysis of the labour impacts of the EITC has strongly confirmed the first effect and found weak or nil evidence of the second and third effects. The presence and strength of these effects is found to vary significantly with characteristics of the beneficiary individual or family, with the most notable effects manifesting for single mothers and married women—the same as those most affected in the NIT experiments.

The extensive research findings on the EITC have been critically surveyed in three articles.<sup>74</sup> One of these studies compactly summarizes the labour impacts of EITC:

There is an overwhelming consensus in the literature that the EITC raises single mothers' labor force participation. There is also evidence of a *negative*, but smaller effect on the employment of married women, who may take advantage of the credit to stay home with their children. There is little evidence of any effects on men, and estimated effects on the number of weeks or hours that women work, conditional on participating at all, are much smaller than those on participation. Indeed, most evidence on the intensive margin [work time by those already working] derives from effects on *reported* earnings among self-employed workers who face negative marginal tax rates and thus incentives to inflate their earnings, which are difficult to verify. (Nichols and Rothstein 2016, 139)

The qualitatively predicted negative effect on work hours in the EITC benefit phase-out range has received little empirical support. The small negative effect on married women's employment likely operates through the income effect of the EITC via their spouses. The EITC has significantly increased work activity and earnings by single mothers, one of the poorest groups, and thereby has been a very successful anti-poverty initiative. EITC benefits are concentrated among families whose net incomes would otherwise have been between 75 and 150% of the poverty line (Hoynes and Patel 2018). In contrast to a NIT, the EITC both induces higher earnings and supplements those increased earnings.<sup>75</sup>

ES programs in jurisdictions other than the U.S. have also been assessed for their effects on participation and work hours. An empirical analysis of Canada's Working Income Tax Benefit based on microdata found small increases in the probability of being employed and in weekly work hours.<sup>76</sup> The United Kingdom introduced a Working Families Tax Credit in 1999, which has also been subject to empirical analysis. The scheme was found to raise lone parents' participation and work hours substantially, reduce hours for full-time workers, and slightly reduce labour supply of fathers and mothers in couples.<sup>77</sup> These findings are generally

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<sup>74</sup> Nichols and Rothstein (2016) and Hoynes and Rothstein (2017) and studies cited therein; also see the earlier survey article by Hotz and Scholz (2003).

<sup>75</sup> However, as explained in a later section, part of EITC benefits redounds to employers rather than beneficiaries through the impacts on equilibrium market wage rates.

<sup>76</sup> Hasan (2013) limited his sample to unattached working-age adults without dependent children; the responses were found to be greater for men than women. The Canadian program is far less generous for childless beneficiaries than the EITC, so much smaller impacts are to be expected.

<sup>77</sup> For citation of four empirical studies of the U.K. scheme, see Hasan (2013, 3).

consistent with those reported for the EITC. However, a recent study challenges almost all of the earlier findings for the EITC for impacts on labour force participation. It attributes much of the earlier estimated impact to the confounding effects of changes in welfare policies and the macro economy over the observation period.<sup>78</sup> Whether this finding will stand and how to reconcile it with the many other findings of increased labour supply and earnings and decreased poverty remains a challenge.<sup>79</sup>

### **Market Wage Impacts of IM and ES Formats**

To the extent that programs of the IM format decrease aggregate labour supply and ES programs increase aggregate labour supply, they might be expected to affect market wage rates for workers of relevant skill levels.<sup>80</sup> The predicted rise in market wages with an IM program and decline in market wages with an ES increase should at least partially offset their respective impacts on gross earnings.<sup>81</sup> Only if market demand for the relevant types of labour were perfectly elastic would no such impact on market wage rates arise. Several studies have investigated this issue for the EITC and NIT using various models and assumptions about the elasticity of demand for labour and the substitutability among classes of labour and other productive inputs (see Barth 1972, 1974; Mieszkowski 1974; Bishop 1979; and Greenberg 1983). Their findings typically modified the standard results only to a modest extent. Market wage rates of low-skilled labour were only moderately depressed, so that EITC recipients' net wage rates (including subsidy) still increased, while similar workers not eligible for EITC suffered a decline in wage rates since they enjoyed no offsetting subsidy.

Other studies of this issue have sought empirical estimates of the EITC's impacts on wage rates rather than utilizing models. One study using inter-state variation in EITCs found the incidence on wage rates to be significant only for high-school dropouts but minimal or nil for those with higher educational attainment (Leigh 2010). Evidence also stems from the saturated site in the Mincome experiment, where all persons with low incomes in a semi-rural town became eligible for NIT treatment. For an NIT, the predicted impact on relevant market wage rates was positive on account of the decrease in aggregate labour supply. Compared with other Mincome sites that used random dispersed samples for experimental treatment, the saturated site displayed larger wage increases and more reports of hiring difficulties.<sup>82</sup> Whether the results

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<sup>78</sup> Kleven (2019) finds the only significant EITC effect on participation arising with the major reform in 1993, which coincided with radical curtailments to the U.S. welfare system that would have increased labour supply. In contrast, introduction of the U.K. scheme coincided with tax and benefit changes that would have *reduced* labour supply (Brewer et al. 2006).

<sup>79</sup> Bastian and Jones (2019, 18–19) present statistical tests that show the EITC had incremental positive effects on labour beyond those of concurrent welfare reforms. Bastian (2019) further estimates large positive impacts of the EITC on maternal employment. Meyer (2002) reports no evidence of adverse impact on work hours in the benefit phase-out range.

<sup>80</sup> Kesselman (1969) and Garfinkel (1973) assessed the role of subsidy incidence in comparing the WRS and NIT.

<sup>81</sup> Widerquist (2005) raises this issue critically and reviews previous studies for their treatment.

<sup>82</sup> Calnitsky (2018); these results were based on firm-level surveys both at baseline and during the experimental payments in the saturated town and seven control towns, using the differences-in-differences method.

of that study would carry over to a large urban area in contemporary markets (45 years later) is an unanswered question.

Two empirical studies utilize *assumptions* about the elasticity of demand for labour, which unavoidably predisposes their findings. One study assumes perfectly elastic labour demand and thus rules out any impacts on market wage rates. With this assumption, it estimates the budgetary cost of an expanded U.S. EITC netting out the offsets from additional taxes paid and reduced social spending. It produces a net cost of just 17% of the gross incremental budget cost (Bastian and Jones 2019).<sup>83</sup> Conversely, another study assumes highly inelastic labour demand and other model features. This framework implies that of every \$1 increase in the EITC, \$0.27 would be captured by employers and only \$0.73 by beneficiaries. For every \$1 increase in NIT, \$1.39 would be gained by beneficiaries including the \$0.39 that employers would have to pay via higher market wage rates.<sup>84</sup> If the pro-work incentives of ES-format programs do prove to depress market wage rates for affected workers, a possible remedy is to raise statutory minimum wage rates. Thus, rather than an EITC and minimum wages being policy alternatives—as has often been claimed in the U.S.—they may serve as effective policy complements (Neumark and Wascher 2011).<sup>85</sup>

### **Non-Labour Impacts of IM and ES Formats**

Positive impacts on a wide range of outcomes unrelated to employment have been reported from analyses of varied cash-type IM programs. Here I focus on evidence and analysis from the U.S. and Canadian income maintenance experiments as well as program reforms in Canada.<sup>86</sup> The U.S. experiments yielded extensive data on a range of behavioural impacts even though their primary focus was on labour responses. Generally positive impacts were observed for beneficiaries with respect to consumption, schooling, and health-related outcomes.<sup>87</sup> However, many of these effects were weak, some absent (such as health-care utilization), and others disputed but possibly negative (such as marital dissolution). It would not be surprising to find some salutary effects on impoverished persons from any measure that

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<sup>83</sup> They justify the neglect of market wage-rate effects by citing positive offsetting intra-household and aggregate demand spillovers (21–22).

<sup>84</sup> See Rothstein (2010, 199); the cited results apply to the total net incomes of all low-income women, single and married, with and without children; most of the differential impact arises for single childless women, who suffer lower wages but are ineligible for any EITC offset. That is, EITC-eligible workers partially crowd out similar but ineligible workers in the job market. The findings appear contrary to many empirical studies finding high anti-poverty effects of the EITC.

<sup>85</sup> This complementarity is found for single mothers and very poor couples with children; conversely, a higher minimum wage makes the EITC less effective for less-skilled minority men and women without children. Neumark and Wascher (2001) also find that the EITC was more effective than minimum wage in raising families above poverty levels. See also the analytical findings in Lee and Saez (2012).

<sup>86</sup> Hamilton and Mulvale (2019) provide findings from the short-lived Ontario Basic Income Pilot, with self-reporting by recipients of improvements in nutrition, health, housing stability, and social connections.

<sup>87</sup> Hanushek (1986) critically surveys many of the studies; see the references cited therein. Rossi (1975) undertook an earlier critical survey of the New Jersey site alone, offering useful insights. Cain (1986) assesses the experiments' impacts on family stability and fertility. Meyer (2010) discusses evidence on the EITC's mixed incentive effects on marriage.

increased their incomes. As one analyst remarked, “[NIT] advocates would claim for it miraculous curative properties, and opponents probably would insist that these very pathologies and causes of poverty were unlikely to be cured by income augmentation alone” (Rossi 1975, 158).

Canadian evidence on non-labour impacts of IM-type programs comes from the Mincome experiment and program reforms to child benefit programs. Much-delayed analysis of data from the 1970s Mincome project has uncovered positive effects on such outcomes as schooling and care work activities and no significant effects on fertility, family dissolution, or birth outcomes. Most notable was a reduction in hospitalization rates especially due to accidents, injuries, and mental health in the Mincome saturation site (see Forget 2011, 2018; and Calnitsky, Latner, and Forget 2019.) The latter 1990s and early 2000s witnessed major federal and provincial reforms of cash benefits for children, including introduction of the National Child Benefit System in 1998. Analysis of the enhanced benefits found significant positive effects on children’s test scores, maternal health, and mental health, with stronger effects on educational and physical health for boys and on mental health for girls (Milligan and Stabile 2011). The introduction of the Canada Child Benefit in 2016, which further increased benefits for families at the lowest incomes, has been found to decrease the incidence and severity of food insecurity, with the largest impacts on persons at the lowest incomes (Brown and Tarasuk 2019).

I now turn to findings on the non-labour impacts of the ES program for which extensive assessments have been undertaken, the U.S. EITC. Again, the program’s long duration and universal coverage for eligible persons make these findings more reliable than those for the NIT experiments. Three survey articles summarize results finding that the EITC had the largest impact on poverty of any U.S. program along with positive impacts on health, birth weight, child health, and children’s educational outcomes.<sup>88</sup> Another article cites studies finding additional EITC impacts: reduced crime and criminal recidivism, reduced suicides, increased child support payments, increased tax filing, and an increased number of “marriageable” men (Bastian and Jones 2019 and studies cited therein). One study found the major EITC expansion for families with two or more children exerted significant improvements to maternal health, with reduced stress levels as measured by risky biomarkers (Evans and Garthwaite 2014). Another study found that EITC expansions increased the likelihood of children in beneficiary families completing high school and college and being employed as young adults (Bastian and Micheltmore 2018; also see Dahl and Lochner 2012).

A key issue for the comparative assessment of alternative policies of IM and ES genres is whether the cited positive impacts on non-labour outcomes are attributable solely to a program’s hike to incomes alone<sup>89</sup> or whether their differential impacts on work and earnings matter. That is, do the increased work and earnings arising with ES programs give them greater

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<sup>88</sup> Nichols and Rothstein (2016) and Hoynes and Rothstein (2017) and studies cited therein; also see the earlier survey article by Hotz and Scholz (2003).

<sup>89</sup> See extensive references to the research literature in Shaefer et al. (2018, 27–28). Jones and Stabile (2020) review evidence for earnings-linked versus other cash transfers, concluding that the issue has not yet been resolved.

efficacy in these outcomes than comparable income increases from IM programs? At present, the empirical literature does not provide a sharp test or clear conclusions; one study refers to this issue:

Taking all of the estimates together, there is robust evidence of quite large effects of the EITC on children’s academic achievement and attainment, with potentially important consequences for later-life outcomes. Indeed, the effects are large enough to demand an explanation for the relatively small estimates of effects of family income on student outcomes that come from non-EITC settings. We do not see this issue as fully resolved. (Nichols and Rothstein 2016, 187)

Another study reviewing the research literature concurred, “... it isn’t clear that one can conclude that one type of benefit income delivery system has a much larger impact on child outcomes than another” (Jones and Stabile 2020).

Other researchers have reflected similarly with respect to measured positive impacts on children’s academic achievement:

It is not clear whether the EITC effects reflect the value of additional financial resources—which could operate through greater consumption or through improved parenting behavior due to reduced stress ... or the impact of increased maternal employment. The former would likely generalize to a UBI, but the latter would work in the opposite direction in the UBI (at least in the very short run) so would not generalize. (Hoynes and Rothstein 2019, 952)

However, with respect to the health outcomes, it appears that income alone and not the work impact are responsible for the EITC’s salutary performance.<sup>90</sup>

Despite the lack of definitive research findings on this issue, ES programs might have better long-run dynamic impacts than IM programs that raise beneficiaries’ net incomes by comparable amounts. These effects operate mainly through the labour force participation and hours responses of mothers (whether married or single)—the groups with the largest declines in work in the NIT experiments. First, a mother actively participating in the labour force may serve as a strong role model for their children, particularly beyond the preschool years.<sup>91</sup> Second, if a mother is able to access quality child care while working, this may provide better early education than the child would receive from an at-home mother.<sup>92</sup> Third, a mother returning to work

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<sup>90</sup> Evans and Garthwaite (2014) find that the estimated health outcomes are little changed by including employment status as well as income.

<sup>91</sup> See Haveman and Wolfe (1995) for evidence of this effect from longitudinal data; they find that parents’ (particularly mothers’) work activity and education significantly affect outcomes for their children as teens and young adults with respect to years of schooling, teenage pregnancy, welfare dependency, and economic inactivity. Nichols and Rothstein (2016, 167) hypothesize “that parents do not fully internalize the long-run negative consequences for their children of modeling low work attachment.”

<sup>92</sup> For discussion of the first two channels of causation, see Nichols and Rothstein (2016, 185). They also suggest that for more highly educated mothers an increase in labour supply may have a negative effect on child’s outcomes, since the child care may have lower quality than home care, but this is not descriptive of most sole-parent mothers.

without a long delay after bearing the child is more likely to remain in the labour force on a long-term basis than one who takes a prolonged absence after giving birth, thereby raising her tax payments and reducing her transfer reliance. This point has been supported by comparative effects of maternity benefit versus child-care benefit provisions, with only the latter yielding faster return to work after childbirth (see analysis and findings in Milligan 2014). Shorter interruptions from work by new mothers also yield long-run wage gains via work experience.<sup>93</sup>

### **Benefit Accounting and Policy Trade-Offs**

Just as the choice of parameters for the benefit structure faces critical trade-offs for an IM or ES program, equally salient trade-offs arise in the design of a program's system for benefit accounting. How these issues are resolved can have major implications for the following policy objectives:<sup>94</sup>

- Benefit responsiveness to income changes (and thus adequacy)
- Equity for individuals with differing income patterns
- Budgetary cost and program caseload
- Incentives for work and other behaviours
- Transparency and intrusiveness
- Administrative and compliance costs

This section discusses each of these objectives and assesses the associated choices for design of the accounting system. The section concludes by describing how various pilot and actual programs have addressed the accounting issues.

### **Policy Objectives**

#### ***Benefit Responsiveness to Income Changes***

The primary purpose of an income-transfer program is to provide adequate support to individuals when their incomes fall too low or vanish entirely. If a program offers an adequate guarantee level but adjusts benefit payments only with significant lags from when a person faces income loss, it does not meet that goal well. Thus, relatively fast response between income variations and corresponding adjustment of benefits is an important policy criterion. This point is accentuated by the fact that many low- and moderate-income households have little savings and limited access to credit to draw upon to tide them over short-lived income declines. Thus, an accounting system that relies on infrequent income reporting with long lags in adjusting benefit payments will perform poorly on the adequacy objective.

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<sup>93</sup> The positive effects on physical and mental health from income-transfer programs of both genres also clearly have long-term implications for work and earnings capacity.

<sup>94</sup> See Allen (1973) for early discussion and analysis of these conflicting objectives. She asserts, "The system ultimately chosen [for NIT accounting and income reporting] ... may indeed determine in large part the extent to which an income maintenance program is perceived to be fair and rational both to its immediate beneficiaries and to the public at large" (43). Also see Whiteford, Mendelson, and Millar (2003) for detailed discussion of these conflicting objectives and Bennett and Hirsch (2001) for analysis of ES design in the U.K. context.

A program's accounting system can adjust benefits to income variations only as frequently as it collects information from beneficiaries about their incomes. Comparison of the RTC and NIT program formats illustrates this difference starkly. The RTC relies entirely on incomes as reported on individuals' filing of annual income tax returns. Thus, a sharp drop in an individual's income early in one calendar year from above break-even to below break-even can be reflected in the provision of benefits only after a lag of up to 16 months.<sup>95</sup> The NIT system, in contrast, requires the filing of income report forms (IRFs) by actual and prospective beneficiaries much more frequently (such as monthly) and thereby can adjust benefit payments more quickly to changing needs. In short, an RTC-based program may need to employ an ancillary income-reporting system or retention of a parallel welfare system to meet the criterion of *responsive adequacy*.<sup>96</sup> Note that an earnings supplement delivered via a refundable tax credit faces similar problems in achieving responsiveness of benefits, albeit in the opposite direction.

### ***Horizontal Equity Among Beneficiaries***

An individual with income fluctuating over the year may receive greater or lesser benefits than an individual with the same total but steady income for the year; this violates the horizontal equity principle that persons in "equal positions" should be treated equally. Whether this situation arises hinges on the pattern of fluctuations and the benefit accounting system. If benefits are calculated on the basis of total annual income, as under a RTC, then the benefits for the two persons will be identical.<sup>97</sup> But if benefits are calculated based on IRFs for periods shorter than a year, as under a NIT, then the total benefits for the two persons can diverge as between the two accounting systems. The outcomes will hinge upon whether the person with fluctuating income dips above or below the program's break-even income and whether the same average income for the stable earner is above or below break-even income.<sup>98</sup>

The three panels of Figure 10 illustrate the phenomenon of potential differential benefit treatment of the two individuals, depending on the income pattern of the workers with fluctuating income (F) versus stable income (S) and whether benefits are based on annual or more frequent accounting. Panel 10a depicts two situations in which the two individuals will receive the same total benefits regardless of whether monthly or annual income measures are employed. If all income fluctuations for worker F lie below the break-even income B, then both workers will receive the same total benefits albeit with different timing. Similarly, if all income fluctuations for worker F are above break-even income B' then neither worker will receive

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<sup>95</sup> If the individual earned a total amount above the annual break-even income in the early part of a year and the income remained very low thereafter, the benefit response could exceed two years.

<sup>96</sup> One recent proposal for a Canadian RTC-based "universal guaranteed basic income" would retain provincial social assistance for precisely this reason (see Stevens and Simpson 2017). The nature of a country's jobless benefits program also affects the extent of this need.

<sup>97</sup> Horizontal inequities could still arise with differing patterns of income variation over multiple years if the standard for assessing "equal positions" relates to this longer period.

<sup>98</sup> With periodic income reporting and accounting, the break-even income is computed on a periodic basis; e.g., a \$30,000 annual break-even equates to a \$2,500 monthly break-even income.

benefits at any time regardless of the benefit accounting system. No horizontal inequity arises in either of these cases regardless of the use of periodic accounting such as a NIT.

Panel 10b depicts the situation where both workers have average incomes above break-even B for the entire period, but worker F periodically has income dropping below break-even. In that case worker F will receive benefits in the periods of low income under a NIT (marked +) but not under a RTC, whereas worker S will not receive benefits under either accounting system. Panel 10c depicts the opposite situation, in which worker F has periods of income rising above B, so as to lose benefits in those periods under an NIT (marked –), even though the two would be treated equally under the RTC's annual accounting. Thus, whether worker F receives more or less total benefits than comparable worker S under periodic and more responsive accounting hinges on the patterns of income fluctuations above and below the break-even income level. In either case, the outcomes violate the horizontal equity principle of "equal treatment of equals."

### ***Budgetary Cost and Program Caseload***

While a shorter benefit accounting period can yield both higher and lower payments to persons with variable incomes, the net effect is found to be an increase in total budgetary costs and program caseloads.<sup>99</sup> This result follows from the greater incidence of persons with incomes dipping periodically from above to below break-even than those with incomes rising periodically from below to above break-even. Many workers with non-poverty annual earnings experience short periods of slack or seasonal work or joblessness pushing them temporarily below break-even. In contrast, the variability of earnings for persons at very low incomes less often yields periods rising above the break-even income levels typically proposed for a NIT or RTC. In a quantitative comparison of illustrative NIT programs with the same annual guarantee and tax-back rate, using monthly versus annual accounting yielded as much as 70% higher cost and 140% more households drawing benefits.<sup>100</sup> Thus, using the NIT format with monthly income reporting and benefit accounting could significantly enlarge the scale and cost of an IM program as well as increase horizontal inequities.

### ***Incentives for Work and Other Behaviours***

The speed of adjusting benefits in response to a beneficiary's income variations can also affect various behavioural incentives.<sup>101</sup> For programs of the ES variety, fast response of benefits to earnings changes may improve the positive work incentives of the supplementation.

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<sup>99</sup> As one early analyst observed, "the monthly accounting scheme would not result in increasing the benefits to the poor; on the contrary, while more than doubling program costs, *more than 55 percent of the expenditures would go to families above their annual break-even points.*" (Watts 1970, 3, emphasis in the original)

<sup>100</sup> These estimates come from a dated study assessing U.S. proposals for a negative income tax (Allen 1973), but they illustrate the potentially large differentials. That study presents the key issues and assesses the carry-forward accounting system described next. Also see the underlying analysis in Asimow and Klein (1970) and Watts (1970).

<sup>101</sup> As noted by Kershaw (1978, 48), "... the accounting period significantly influences the tax rate by changing the marginal effect of a marginal change in income. ... Essentially, since the accounting period has the effect of smoothing the payments stream that results from changes in income, it changes the tax rate for some individuals."

Conversely, for programs of the IM variety, slow or obscured responsiveness of benefits to income variations may mute the implicit work disincentive effects of tax-back provisions. Some ES formats such as the ETC also have a tax-back income range over which similar disincentive issues arise for some beneficiaries. Accounting systems with relatively slow response of benefits can thus have either favourable or adverse impacts on incentives depending on the benefit format. Even with monthly IRFs, benefits can be adjusted based on the moving average of recent reported earnings; this will dampen the responsiveness of benefits but mute the perceived disincentives of the tax-back rate.<sup>102</sup>

Any benefit accounting system that is relatively favourable to persons with more variable earnings will provide an incentive for entering occupations or taking jobs that are more irregular in their work patterns such as seasonality. Thus, similar to programs for unemployment benefits, an income-transfer program can bias the industry structure and employment patterns in some regions. Such a system will also pose problems in covering self-employed persons, who have great flexibility in reporting the timing of gross receipts, expenses, and net incomes. As a consequence, a responsive income-transfer system will need to apply different income reporting and accounting provisions for the self-employed. The result would be lesser benefit responsiveness for the self-employed with potential disincentives for entering or remaining in self-employment.

### ***Transparency and Intrusiveness***

A more responsive benefit system requires more frequent reporting of income by individuals than the annual ex post reporting associated with the income tax system. The use of periodic IRFs is not simply a costly burden to individuals and program administrators, but it has also been reported as an unwelcome intrusion by beneficiaries in a focus group (Battle and Mendelson 1997, 67). On the other hand, accounting and benefit systems that seek some responsiveness using complex carryovers to smooth out the benefit fluctuations lack transparency to beneficiaries. The result is that beneficiaries do not have a clear understanding of how changes in their earnings will affect their net benefit payments. Thus, a trade-off between the intrusiveness of frequent income reports and benefit transparency exists if the aim is to avoid sharp benefit fluctuations.

### ***Administrative and Compliance Costs***<sup>103</sup>

An income-transfer program that relies entirely on information on income tax returns faces lesser burdens in administration or compliance but is limited to annual accounting with its slow responsiveness.<sup>104</sup> Achieving greater responsiveness requires an accounting system that

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<sup>102</sup> For example, with monthly IRFs and a four-month averaging period, a 50% tax-back rate will cause benefits to vary by just 12.5% of the previous month's earnings change.

<sup>103</sup> Kershaw (1973) describes the administrative and compliance issues arising with different choices on the frequency of IRFs and associated benefit accounting.

<sup>104</sup> In cases where an individual's income tax is later reassessed, issues would arise about how to adjust benefits including possible recoupment of excess payments. In cases where individuals fail to file an annual tax return, the issue arises of whether to disqualify them. Note that programs using the RTC method include several of both the IM

gathers income information more frequently and more quickly than the existing tax system. Most previous NIT experiments required that beneficiaries file monthly IRFs, which were used to adjust their succeeding monthly benefits. The use of periodic IRFs carries substantial costs and burdens on both program administrators and beneficiaries. The challenges of IRFs are even greater for a universal NIT than they were with the pilot programs, since the households in the pilots were pre-selected for having low incomes whereas a universal program would need to enrol many persons with incomes declining from above to below break-even levels. Some accounting systems would need to recoup excess benefit payments, which could impose burdens on many affected households.

### **Trade-Offs and Policy Approaches**

The preceding discussion identifies important conflicts among the key objectives of any benefit accounting system. If it is deemed essential to make benefits more responsive to income variations than feasible with a retrospective annual system based on income tax filing, then trade-offs with the other policy objectives are unavoidable. Figure 11 depicts the nature of these trade-offs. Only in the case of an ES program are greater responsiveness and favourable work incentives positively related, at least for earnings in the supplementation range. Otherwise, raising the system's responsiveness must come at the cost of worsened horizontal equity, higher budgetary cost, greater administrative and compliance burdens, and (in the case of IM programs) weakened incentives.

To provide a balance among these conflicting objectives, carryover systems of accounting were developed for various NIT experiments. These systems use periodic IRFs and also consider past income deviations from the break-even level in assessing a household's current benefit.<sup>105</sup> This approach allows for better responsiveness than an annual retrospective system while reducing the extent of horizontal inequities and the excess budgetary cost and number of beneficiaries. Several variants of this approach can be implemented, but a key component is to track a household's departures from its per-period break-even income (both positive and negative) and to factor the total into the current benefit calculation. The period for tracking past departures is a choice parameter but is typically taken to be one year after which previous figures are disregarded.

### **Accounting and Benefit Systems in Practice**

Versions of the carryover accounting system with monthly IRFs were used in the U.S. NIT experiments in the 1970s and the Manitoba Mincome experiment. The Canadian Self-Sufficiency Project in British Columbia and New Brunswick in the mid-1970s used an NIT-WR format that required at least 30 hours of work per week for benefits. IRFs had to be filed along with pay stubs every four weeks or month (depending on the pay frequency) to verify earnings and hours, and benefit payments were adjusted accordingly within about three weeks. The

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and ES formats.

<sup>105</sup> Allen (1973) presents simulated results for several variants of the carryover system including ones that use LIFO or FIFO for applying past deviations to calculating current benefits.

recent Ontario “basic income” pilot also used an NIT format for benefits but was haphazard in its benefit accounting system. Initial benefits were based on households’ previous year’s incomes, and they were given the *option* of quarterly filing if their incomes changed while receiving payments.<sup>106</sup> Given the benefit structure, households had no incentive to report increases in incomes, and apparently the program never sought to recoup any resulting overpayments.

The current Canada Child Benefit and Canada Workers Benefit use the RTC method, with its long lags in responding to income variations. Although the CCB is disbursed as monthly payments, this does nothing to overcome that deficiency. The Canada Workers Benefit is disbursed either as an offset to taxes due or a lump payment after annual tax filing; again, this does nothing to improve responsiveness. The 2018 federal budget mooted an unspecified method to make the Canada Workers Benefit more responsive through advance payments, presumably based on forward estimates of a worker’s earnings for the year. A similar option for workers to take advance payments under the U.S. EITC was discontinued after experiencing very low take-up.<sup>107</sup> But even advance payments are not responsive to contemporaneous earnings variations. Without some method of measuring intra-year income fluctuations, any expanded tax-based income-transfer system will suffer long lags in responsiveness. And any scheme, regardless of whether it relies on the income tax system, will need to be supplemented by extensive outreach strategies in order to reach many of the poorest and most destitute individuals.<sup>108</sup>

One ES program in Canada provides relatively rapid response to a beneficiary’s income and earnings variations through the use of intra-year mandatory reporting. Saskatchewan’s Employment Supplement program requires the submission of report forms four times per year for beneficiaries with stable incomes and every month for those with fluctuating incomes. Benefits are paid each month based on the previous month’s reported income. Beneficiaries are subject to random audit to control for false or misleading reporting, with verification needed in the form of pay stubs, tax records, and/or self-employment records. Apart from provincial IA and disability assistance programs—most of which also require frequent or monthly income reporting—the Saskatchewan scheme is a rare example of a Canadian income-transfer program structured to respond quickly. Conceivably, income tax withholding could be reformed along the lines of the U.K.’s “pay-as-you earn” cumulative assessment system to deliver social benefits, but this would entail a radical revamp of the Canadian tax system.<sup>109</sup>

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<sup>106</sup> These details of the SSP and Ontario pilot are little documented, and I thank Susanna Lui Gurr of the B.C. Centre for Employment Excellence and Jim Dunn of McMaster University, respectively, for information on these programs. Note that the 28% of Ontario basic income participants who had been on the Ontario Disability Support Program were granted continued drug and dental coverage plus an additional \$6,000 per year beyond their basic income payments.

<sup>107</sup> The advance payments were issued by employers as a negative credit on tax withholding from regular paycheques. See Nichols and Rothstein (2016, 45–47) for review of attempts to explain the extremely low take-up rates of the advance payment option.

<sup>108</sup> In a 2018 count of homeless persons in Calgary, AB, just 3% reported receiving the GST credit and 4% federal seniors benefits (thus suggesting a very low rate of income tax filing), whereas 23% reported receipt of provincial income or disability assistance. Calgary Homeless Foundation (2018, 48). Also see Green et al. (2020).

<sup>109</sup> For description and evaluation of the U.K. and other countries’ assessment systems, see Barr, James, and Prest

The severity of the timing and responsiveness issue is also related to provisions for jobless benefits such as Canada's Employment Insurance program. The "normal" sequence for persons after becoming unemployed is to draw Employment Insurance benefits and, if they remain unemployed after exhausting their Employment Insurance benefit period, to seek IA benefits if they meet eligibility requirements. However, since the reforms of the 1990s increasing numbers losing work no longer qualify for Employment Insurance benefits and thus go more quickly to IA. If a major reform of the transfer system such as a generous RTC program were instituted and replaced IA, then the responsiveness issue would become critical; some new form of emergency relief would be needed.<sup>110</sup> Conversely, if IA programs were retained along with the new RTC, then the administrative and cost savings would be foregone. Moreover, a new system to recoup payments to persons receiving both IA and RTC benefits might be needed with the associated complexities and inequities.

### **Coordination with Benefit and Tax Provisions**

Moving from the realm of *de novo* design choices for income-transfer systems to the real world of existing policies and provisions forces one to consider operational and implementation factors. Any new or reformulated programs need to be coordinated with existing provisions, or the extant programs would need to be modified or supplanted to accommodate the reforms. This section surveys some of the generic issues that would have to be addressed;<sup>111</sup> the following section canvasses the issues in the context of the B.C. government pursuing such reforms without concomitant national reforms.<sup>112</sup>

### **Joint versus Individual Income Testing**

The personal income tax system of many countries, including that of Canada, is essentially based on individual filing.<sup>113</sup> That means that most spouses (except when one has very little income) file a separate return with progressive tax rates applied to their own income. In contrast, almost all cash and in-kind benefit programs that are income-tested (including some provisions operating within the personal tax system) are based on the joint incomes of couples.<sup>114</sup> This difference in treatment is based on many factors, including the notion that

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(1977).

<sup>110</sup> Two proposals for a major Canadian RTC have taken divergent approaches on this matter. Boadway, Cuff, and Koebel (2018) would abolish IA, whereas Stevens and Simpson (2017) would retain IA. The former approach is problematic without intra-year income testing.

<sup>111</sup> For analysis of issues in integrating transfer programs, see Lurie (1975b) and Mirer (1975).

<sup>112</sup> Tedds (2017) assesses the issues and challenges in integrating or coordinating a new wide-based RTC or NIT with the existing Canadian tax system.

<sup>113</sup> See Kesselman (2008) for analysis of the tax filing unit and international comparisons; also Laurin and Kesselman (2011) for quantitative analysis of impacts for the Canadian tax system.

<sup>114</sup> One notable exception in the Canadian context is the tax recovery on higher-income recipients of Old Age Security benefits, which are tested on individual income, in contrast to IA or Guaranteed Income Supplement benefits, which are tested on joint incomes. Social insurance programs also typically refer only to the income or situation of the individual beneficiary.

benefits targeted at the poor should not be paid to low-income spouses with higher-income partners. This social convention likely implies that the public would not accept a significant move toward an NIT, RTC, or ETC with net benefits based on individual incomes.<sup>115</sup> However, such an initiative could impel greater moves of the personal tax system toward joint filing with rates based on joint incomes.

### **Overlapping Income Tests and METRs**

In addition to the tax-back rates embodied in IM and ES programs, beneficiaries also face further reductions in their net returns from incremental earnings via the tax-back and tax rates of other benefit and taxation programs. In the tax domain, these include income taxes, employee payroll taxes, and the impacts of sales and business taxes on the prices of consumer goods and services. In the benefit domain, these include various income-conditioned cash and in-kind programs (such as housing and daycare subsidies) as well as income-tested benefits delivered through the tax system. These provisions can cumulate to create very high total METRs with associated adverse impacts on incentives and compliance.<sup>116</sup> The impacts can be moderated if an expanded or new cash-transfer program (such as a RTC or NIT) is used to reduce or fully supplant existing income-tested programs.

The personal income tax system poses acute challenges for the design of major IM programs, particularly the NIT format. The break-even income of an NIT with a guarantee even half the poverty threshold and without a very high tax-back rate will likely exceed the threshold for personal income tax.<sup>117</sup> Thus, over the income range where the two policies overlap, individuals will simultaneously be taxpayers and beneficiaries, facing an METR that is the sum of the tax-back rate and the marginal tax rate. This problem bedevils attempts to design a NIT program that does not face incentive, compliance, and coordination challenges. For example, the NIT proposal of the Macdonald Commission in the 1980s ignored the problem of high METRs resulting from this overlap.<sup>118</sup> NIT schemes' need for additional revenue to cover their finance could push income tax rates higher, thus exacerbating the problem.

### **Inter-Program Eligibility Issues**

Some transfer programs make eligibility for their benefit conditional on meeting the eligibility requirements of a second program; this can ease administration. Typically one program is an in-kind benefit with discrete value of  $K$  per period, and the other program is an

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<sup>115</sup> Yet, some advocates of a NIT or RTC support separate payments to each spouse with any income test applied only to individual incomes; a UBI would be purely individual-based.

<sup>116</sup> Typically these tax and tax-back rates cumulate by simple addition, such as  $METR = r_1 + r_2$ . However, this impact can be reduced by making the income test of one program ( $r_1$ ) hinge on the beneficiary's net-of-tax income ( $1 - t_1$ ), yielding a  $METR = r_1 + (1 - r_1) t_1$ , which is less than  $r_1 + t_1$ . For alternative ways of integrating various programs' income tests, see Mirer (1975).

<sup>117</sup> To avoid such overlap would require some combination of very low guarantee level and very high tax-back rate. The federal taxable income threshold for an individual in 2020 is \$13,229.

<sup>118</sup> The proposal was dubbed the Universal Income Security Program; see Royal Commission (1985, Volume 2, 795–800). For a critique, see Kesselman (1986).

income-tested cash transfer. For example, having income sufficiently low to qualify for IA cash benefits may entitle a person access to extended health and dental services. Thus, if a person increases their earnings a small amount from just below break-even to the break-even level, they lose not just a small amount of cash transfer ( $r$  times their incremental earnings) but all of the in-kind benefit. Figure 12 shows this “cliff” effect in which an extra dollar of earnings near break-even yields a much larger loss in the form of the entire in-kind benefit ( $K$ ). This situation is sometimes called a benefit “notch,” and it can impose strong disincentives to earning one’s way off welfare.

Three alternative methods can be used to address this problem, and each has administrative or budgetary costs. First, one could institute a separate income test for the in-kind benefit with a different break-even income than that of the cash transfer program. However, so long as the in-kind benefit has a discrete value, this merely shifts the level of income where the cliff arises; it also likely leads to a compounding of two separate tax-back rates. Second, if the in-kind benefit is divisible (such as a dollar limit on dental benefits per year), then the tax-back rate for those benefits either in the cash-transfer or in a separate income test for benefits can be applied without creating a cliff. A third possible approach is to make the in-kind benefit available without charge to the entire population. This universal provision could be very costly, but the cost might be contained by making access to or quality of the in-kind benefit such that it is less desirable for persons at higher incomes who can afford to purchase something better in the market.<sup>119</sup>

### **Implications for B.C. Policy Choice**

The general principles reviewed and assessed in this paper have relevance for the design choices over income-transfer programs in any jurisdiction, be it national or sub-national. However, at a provincial level such as British Columbia, the policy choices are further constrained by a variety of considerations. These factors include the existence of national-level social programs, federal-provincial transfers, limited fiscal capacity for significantly expanded spending, and issues of inter-provincial migration by taxpaying workers at various levels and potential program beneficiaries. Some of these factors in turn have implications for the extent to which a single province may choose to pursue unconditional income maintenance versus earnings supplementation out of concern for economic and fiscal impacts. This section briefly canvasses issues of these kinds.

### **Limitations of Provincial Policy Discretion**

A single province acting on its own to substantially expand or liberalize its income security system would be limited in many ways by the federal policy context. National programs such as the Canada Child Benefit, Old Age Security, Guaranteed Income Supplement, Employment Insurance, and federal transfers via the personal tax system could not readily be

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<sup>119</sup> See Kesselman and Mendelson (2020) for elaboration and assessment of this method and broader discussion of alternatives in reforming in-kind benefits under a cash transfer program.

adapted to the program reforms of a single province. Rather, the provincial reforms would need to accommodate to the existing federal provisions. Participation by B.C. in a federal-provincial Tax Collection Agreement further limits the scope for provincial policy variation; departing from that agreement and instituting a separate B.C. income tax system would carry additional costs for the province and likely public opposition. However, like other provinces, B.C. does have considerable discretion over employment standards, minimum wages, public and advanced education, and other in-kind benefit programs—all of which are important elements of income security policy.

### **Federal Provision of Provincial Policy Flexibility**

The federal government already provides limited forms of discretion to the provinces in specified areas of social policy. Some examples include federal-provincial Labour Market Development Agreements and Workforce Development Agreements, provincial cost-neutral variations in parameters of the Canada Workers Benefit, and an option for provinces to vary Canada Child Benefit on a cost-neutral basis. The last item is limited to variations in the per-child benefit based on ages or numbers of children in a family; to date, no province has pursued this option. The federal government also will undertake the administration and delivery of payments for provincial child benefit programs along with the CCB; six of the eight provinces with such a program have taken up this offer. One could also contemplate a change in federal legislation for the CCB that would give the provinces some flexibility over other parameters of the program such as tighter targeting of benefits on families at lower incomes.<sup>120</sup>

### **Cash Benefits Relative to In-Kind Benefits**

Like other Canadian provinces, British Columbia has wide discretion in its choice of how to allocate total social spending between cash benefits (such as IA) and in-kind benefits (such as child care and housing subsidies). The constitutional allocation of spending authority leaves most in-kind social program spending to the provincial level. Federal transfers to B.C. via the Canada Health Transfer and the Canada Social Transfer contain restrictions on how the funds can be spent. However, the funds transferred are significantly less than total provincial spending in those areas, affording the province wide discretion on the allocation of resources between the two types of benefits as well as among specific cash and in-kind benefits.<sup>121</sup> The considerations governing social policy choices between cash and in-kind benefits and how they are best combined for effective outcomes are numerous, complex, and nuanced.<sup>122</sup>

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<sup>120</sup> For such a proposal and detailed assessment of scenarios, see Kesselman (2019, 2020).

<sup>121</sup> These transfer programs have restrictions on how the funds can be spent, but generally both those regulations and the infra-marginal nature of the transfers to each province still leave wide scope for policy discretion at the provincial level.

<sup>122</sup> See Kesselman and Mendelson (2020) for general analysis with extensive references as well as application to the potential conversion of B.C. in-kind benefits to cash benefits.

## **Limitations of Provincial Financing**

If British Columbia were to consider a major expansion of income support (whether through more accessible and more adequate IA or structural reforms such as a NIT or UBI), it would also face financial constraints in acting alone.<sup>123</sup> The requisite increase in provincial tax rates could raise issues of competitiveness for business and the location choices of both businesses and highly skilled workers. Such policy changes might also attract migration to the province of more needy, vulnerable individuals, which could further strain provincial finances. Moreover, proposals to finance a NIT by cashing out non-refundable tax credits would not generate much revenue for B.C., with its very low bottom bracket tax rate (5.06%) and relatively low values for basic, marital, and other non-refundable credits.<sup>124</sup> Thus, the cost of the reforms would mostly need to be covered by significantly higher rates of personal, corporate, and/or sales taxes.

## **Expanding Support via Earnings Supplementation**

Almost all IM variants including NIT and RTC programs impose a tax-back rate on beneficiary earnings and thus pose disincentives to working, entering the labour force, and undertaking actions that increase earnings potential. Only when these programs apply tax-back rates lower than the rates in welfare-type programs that they displace are such reforms conducive to better incentives. However, all NIT and RTC proposals extend coverage to income levels well above those welfare programs (that is, their break-even levels are higher) and thereby engage many of the working poor who were not eligible for welfare; thus, even when a reform program alleviates disincentives for some of the poor, it will exacerbate disincentives for many others. Accordingly, with respect to employable persons, utilizing the earnings supplementation format will generally be superior in its positive incentives for entering the labour force, working more, and increasing earnings. As noted previously, this strategy requires a means for categorizing applicants based on their employability, so that those deemed unable or not expected to work can be provided adequate benefits via cash transfers of the IM variety.

At the provincial level, B.C. has two ways of augmenting the supplementation for lower-earning workers. First, it can modify the targeting of Canada Workers Benefit paid by the federal government to workers in the province. The B.C. Government could enter into a “reconfiguration” agreement with the federal government that modifies the program’s parameters to improve benefit targeting.<sup>125</sup> Any such change would require agreement by the federal authorities, and the changes would be constrained to be cost-neutral in aggregate for

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<sup>123</sup> The longer-run fiscal outlook for B.C. appears quite constrained; see Tombe (2020).

<sup>124</sup> For two such proposals, see Boadway, Cuff, and Koebel (2018) and Stevens and Simpson (2017) and a critique in Kesselman (2018). Note that those proposals would not simply make the credits refundable but would also make them income-tested. Such a reform would reduce the taxable threshold to zero, thus requiring major changes to tax administration and compliance and raising incentive issues. Simpson and Stevens (2019) offer a similar proposal for Alberta acting alone; but note that Alberta’s higher first-bracket tax rate and basic personal amount offer much more of this “self-financing” potential than the British Columbia counterpart.

<sup>125</sup> Canada Finance (2016) provides detailed statistics on the characteristics of Working Income Tax Benefit recipients in the program’s early years, 2009–2012, including inter-year variability of individual claims.

B.C. beneficiaries.<sup>126</sup> Second, B.C. could implement a parallel earnings supplementation program that would operate alongside the federal Canada Workers Benefit. Three provincial schemes of this kind are already operational: Alberta's Family Employment Tax Credit and the Saskatchewan Employment Supplement (both programs restricted to households with a dependent child) and Québec's Work Premium Tax Credit. All are structured like an ETC similar to the Canada Workers Benefit but with differing eligibility, earnings phase-in and phase-out thresholds and rates, maximum benefits, and administration.<sup>127</sup>

Categorization of individuals based on their employability would be one way to maximize the potential of an ES scheme while permitting more adequate support levels through an IM scheme for those deemed less employable. The lines between these two means of income support would necessarily be somewhat blurred on account of children in families and concern over classification errors. One proposal would address these issues by combining a highly accessible RTC offering a relatively low guarantee level with an ES scheme; the latter would provide a benefit phase-in with no tax-back over an initial range of earnings until after the beneficiary attained the maximum ES benefit, after which a high tax-back rate would be applied.<sup>128</sup> This approach might appear to avoid the need for categorical treatment of beneficiaries, but the low basic guarantee level would necessitate vetting to ensure a higher guarantee for persons with disabilities.

### **Reforming IA to Be More Like NIT/RTC**

Rather than wholesale replacement of B.C. income assistance programs with a UBI or NIT/RTC, one option would be incremental reform to assume some attributes of those formats. This reform could involve expanded earnings exemptions for IA beneficiaries. These exemptions are sometimes called disregards, and as noted earlier they can take the form of flat sums (such as  $E$  dollars per period) or proportions (such as rate  $e$ ). (See Figure 2.) A proportionate disregard at rate  $e$  is equivalent to a tax-back rate of  $r = 1 - e$ . Such disregards can instill some incentives for beneficiaries to generate and report earnings, but they also increase the break-even income levels for the IA program and thus raise the cost and number of beneficiaries. These disregards have the following impact on a program's break-even level:  $B = E + G/(1 - e)$ , which reduces to  $B = G$  with no disregards ( $E = e = 0$ ). For beneficiaries classified as expected to work in B.C.,  $E = \$400$  per month and  $e = 0$ , so that beyond that limited level no incentive to work exists. For disability beneficiaries,  $E = \$12,00$  per year and  $e = 0$ , so that

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<sup>126</sup> The federal government reached reconfiguration agreements with Alberta, British Columbia, Québec, and Nunavut under the previous Working Income Tax Benefit. See Kesselman (2019) for the requirements of such agreements and Petit and Kesselman (2020a, 2020b) for discussion of potential with respect to further modifications for B.C. and proposals for a provincial earnings supplementation scheme.

<sup>127</sup> As noted previously, the Saskatchewan program requires intra-year income reporting and adjusts monthly benefits quickly in response to changes.

<sup>128</sup> In essence this is the ETC-RTC proposal by Koebel and Pohler (2019). However, their scheme is envisaged for implementation with joint federal-provincial participation and also entails financing via major taxation changes that would not suffice for B.C. acting alone.

earnings up to that level is financially rewarding.<sup>129</sup> Other provinces have various IA disregards, such as Ontario's  $E = \$200$  per month and  $e = 0.50$ .<sup>130</sup>

Another way to make B.C.'s existing IA programs more like NIT/RTC programs would be to reduce or eliminate some of their eligibility conditions. One example is the asset test, which requires that assets of various kinds not exceed specified limits. Until 2019, for applicants in the expected-to-work IA category, B.C. required 5 weeks of job search, sale of vehicles valued over \$10,000, and early initiation of Canada Pension Plan benefits. These and other requirements were relaxed,<sup>131</sup> and further reforms along these lines would make the program more like an unconditional NIT/RTC program. Of course, so long as reforms remain within the IA structure, they will have the character of an NIT with monthly income reporting rather than a RTC format operated through the tax system. Retaining significant eligibility requirements of the kinds currently in IA would make it difficult to transition the system to a RTC format given the differing administrative needs.

### **Conversion of Special Allowances to Cash Transfers**

If British Columbia were to undertake a major reform of income support along the lines of a UBI, RTC, or NIT, a key question would be the treatment of special allowances now available to IA beneficiaries based on particular needs.<sup>132</sup> With a UBI the entire population would be beneficiaries, so that eligibility would no longer be confined to the relatively needy group now receiving IA (including disability beneficiaries). Thus, unless all special allowances were either eliminated or provided universally, separate rules and administration would be needed to assess eligibility. Similarly, because a RTC assesses benefits only with a long lag, it would require separate administration of special allowances if the scheme were to replace IA. A NIT with frequent income reporting has a beneficiary group more congruent with current need, so that special allowances could be restricted to that group, but administrative resources would still be needed for assessment of discretionary needs. Regardless, the issue of which allowances should be converted to a higher cash guarantee for all beneficiaries would remain. If all beneficiaries received the cash equivalent of the allowance, this would inflate the overall program cost. If an allowance were only partially converted to an unrestricted cash benefit, those individuals who had previously been most reliant on the allowance would be net losers.

### **Conclusion**

The design of an income-transfer program or system involves numerous considerations, including its objectives, benefit structure, economic and incentive effects, and operational features. A key objective is the alleviation of poverty by providing cash resources to those most

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<sup>129</sup> The cited disregard levels apply to single beneficiaries; higher levels apply where the family has two or more eligible persons; the levels are slated to rise by 25% in 2021.

<sup>130</sup> See Tweddle and Aldridge (2019, 92–99) for earnings disregards in each jurisdiction.

<sup>131</sup> See Government of British Columbia (2019, 36–38) for details.

<sup>132</sup> For extended treatment of this issue, see Kesselman and Mendelson (2020).

in need, often affected by judgments of relative deservingness of various groups. Programs can be differentiated based on their benefit structures between income maintenance (IM) and earnings supplementation (ES). IM programs provide an unconditional income floor regardless of any work or earnings by the beneficiary; their benefits decline with income or earnings, leading to disincentives for working and to earning more, and biases toward working in the cash economy and failing to report full incomes. ES programs provide no such unconditional income but rather benefits that hinge on working and rise with earnings (at least over a range); they provide positive incentives for working in the legitimate economy and full reporting of earnings (at least over a range). The greater the provision of ES programs and the higher their benefits, the lesser will be the pressure on IM programs to classify applicants based on employability or to impose work/job-search requirements in order to maintain higher benefit levels for those with limitations on their ability to work.

Income-transfer programs need to consider a wide range of elements in their design including: the beneficiary unit, eligibility conditions, size and scaling of benefits, income aggregation within families, the income measure, and potential asset tests. Each of these choices impacts coverage, accessibility, and cost of the program. Moreover, those elements plus the benefit structure affect the program's adequacy, incentives, and cost with severe trade-offs among those items as well as implications for program take-up and stigma. Additional policy trade-offs among benefit responsiveness, incentives, budgetary cost, and operational burdens arise with the design of benefit accounting, whether by frequent income reporting or via annual tax filing. The ability to reform current welfare-type programs or to replace them with more streamlined IM and ES programs will be affected by both operational and cost considerations as well as public acceptance related to social norms and views on the relative deservingness of various beneficiary types. Additional fiscal, institutional, and operational factors will affect the potential for major reform of welfare programs at the level of subnational jurisdictions.

This paper applies all of these findings and insights to a broad discussion of implications for reform of British Columbia's income-transfer system. Important elements of that discussion involve limitations on policy discretion and fiscal resources at the provincial level plus the potential for added provincial discretion within federal income-transfer programs.<sup>133</sup> Other policy issues for B.C. that also draw on the framework of this paper include: (a) the balance between programs that transfer cash incomes and those distributing in-kind goods and services; (b) the conversion of certain in-kind supplemental benefits now associated with B.C. Income Assistance to cash transfers; (c) the reform of B.C. Income Assistance to be more like a refundable tax credit or negative income tax with easier access and lesser stigma; and (d) expanding earnings supplementation for low-wage B.C. workers via provincial top-ups to the federal benefits. The paper provides a conceptual basis for understanding and crafting reforms of these diverse kinds for British Columbia.

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<sup>133</sup> In particular, the Canada Child Benefit and the Canada Workers Benefit.

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**Table 1***Formats with Net Benefits Declining with Income*

<b>Benefit format</b>	<b>Tax-back rate (r)</b>	<b>Break-even income (B)</b>	<b>Benefit responsiveness</b>	<b>Benefit payment</b>	<b>Administrative delivery</b>
Universal basic income (UBI)	0	$\infty$	Instantaneous <sup>a</sup>	Gross (ex ante)	Direct payment
Negative income tax (NIT)	$0 < r < 1$	$G/r$	Monthly	Net (ex post)	Direct payment
Refundable tax credit (RTC)	$0 < r < 1$	$G/r$	Annual + lag	Net (ex post)	Tax system
Welfare/income assistance (IA)	1	G	Monthly	Net (ex post)	Direct payment

Note: <sup>a</sup> Full guarantee is paid out universally without application of an income test; financing may entail a form of income test.

**Table 2***Formats with Net Benefits Rising with Earnings*

<b>Benefit format</b>	<b>Tax-back rate (r)</b>	<b>Break-even income (B)</b>	<b>Benefit responsiveness</b>	<b>Benefit payment</b>	<b>Administrative delivery</b>
Earnings tax credit (ETC)	$0 < r < 1$ $-1 < s < 0$	See text	Annual + lag	Net (ex post)	Tax system
Earnings tax credit with refundable tax credit (ETC-RTC)	$0 < r < 1$ $-1 < s < 0$	See text	Annual + lag	Net (ex post)	Tax system
NIT with work requirement (NIT-WR)	$0 < r < 1$	G/r	Monthly	Net (ex post)	Direct payment
Wage rate subsidy (WRS)	N/A <sup>a</sup>	N/A <sup>a</sup>	Pay period	Net (ex post)	Direct payment

Note: <sup>a</sup> WRS applies a phase-out rate to increased market wage rate and has a break-even wage rate ( $W^*$ ), but net benefit always rises with the beneficiary's work hours and associated earnings.

**Table 3***Classification of Claimants*

	<b>Claimant <i>satisfies</i> eligibility criteria</b>	<b>Claimant <i>lacks</i> eligibility criteria</b>
<b>Claim is accepted</b>	<b>True negative (TN)</b> <b>Correct outcome</b> <i>Specificity</i>	<b>False negative (FN)</b> <b>Acceptance error</b> <i>Type II error</i>
<b>Claim is rejected</b>	<b>False positive (FP)</b> <b>Rejection error</b> <i>Type I error</i>	<b>True positive (TP)</b> <b>Correct outcome</b> <i>Sensitivity</i>
<b>Sum of frequencies</b>	<b>1</b>	<b>1</b>

**Null hypothesis:** Person satisfies eligibility criteria

Negative = fail to reject the null hypothesis; claim is approved

Positive = reject the null hypothesis; claim is rejected

False = person falls into wrong classification (opposite to true characteristics)

True = person falls into correct classification (same as true characteristics)

Type I error =  $FP/(TN + FP)$ , proportion of actual negatives (those who do satisfy eligibility criteria) who are incorrectly identified (denied benefits)

Type II error =  $FN/(TP + FN)$ , proportion of actual positives (those who do not satisfy eligibility criteria) who are incorrectly identified (granted benefits)

Sensitivity =  $TP/(TP + FN)$ , proportion of actual positives (those who do not satisfy eligibility criteria) who are correctly identified (denied benefits)

=  $1 - \text{Type II error}$

Specificity =  $TN/(TN + FP)$ , proportion of actual negatives (those who do satisfy eligibility criteria) who are correctly identified (granted benefits)

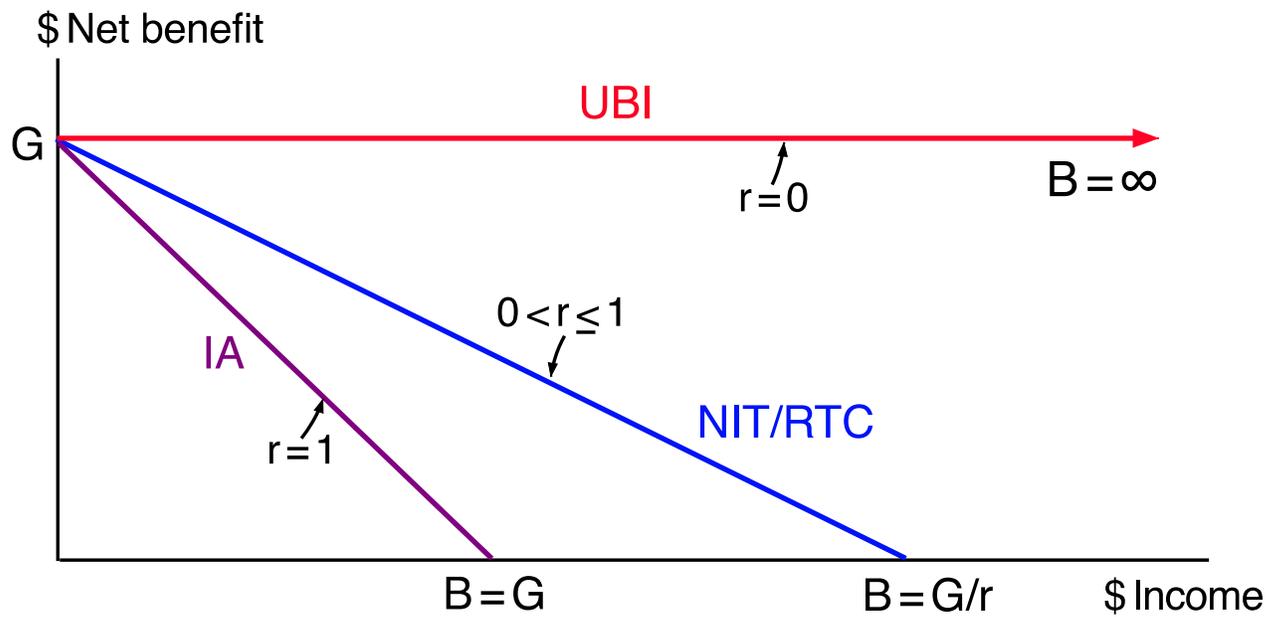
=  $1 - \text{Type I error}$

**Table 4***RTC/NIT Policy Conflicts*

<b>Hold constant policy parameter</b>	<b>Variation of policy parameter</b>	<b>Unavoidable adverse outcome</b>
G (adequacy)	Decrease r (better incentives)	Higher B (higher cost)
G (adequacy)	Decrease B (lower cost)	Higher r (worse incentives)
B (cost)	Decrease r (better incentives)	Lower G (lower adequacy)
B (cost)	Increase G (better adequacy)	Higher r (worse incentives)
r (incentives)	Increase B (more coverage)	Lower G (lower adequacy)
r (incentives)	Increase G (better adequacy)	Higher B (higher cost)

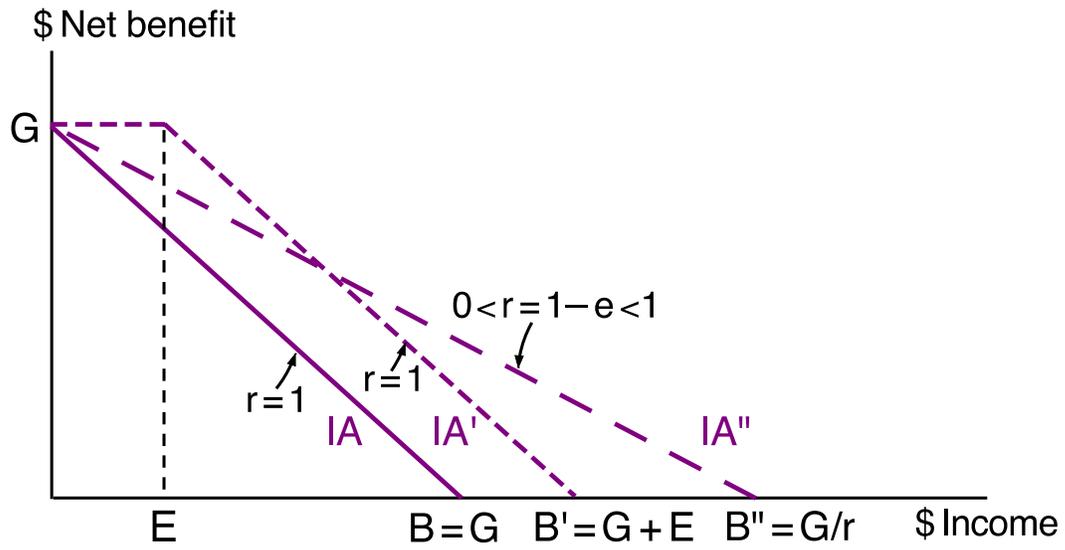
**Figure 1**

*Formats for Universal Basic Income, Negative Income Tax/Refundable Tax Credit, and Income Assistance*



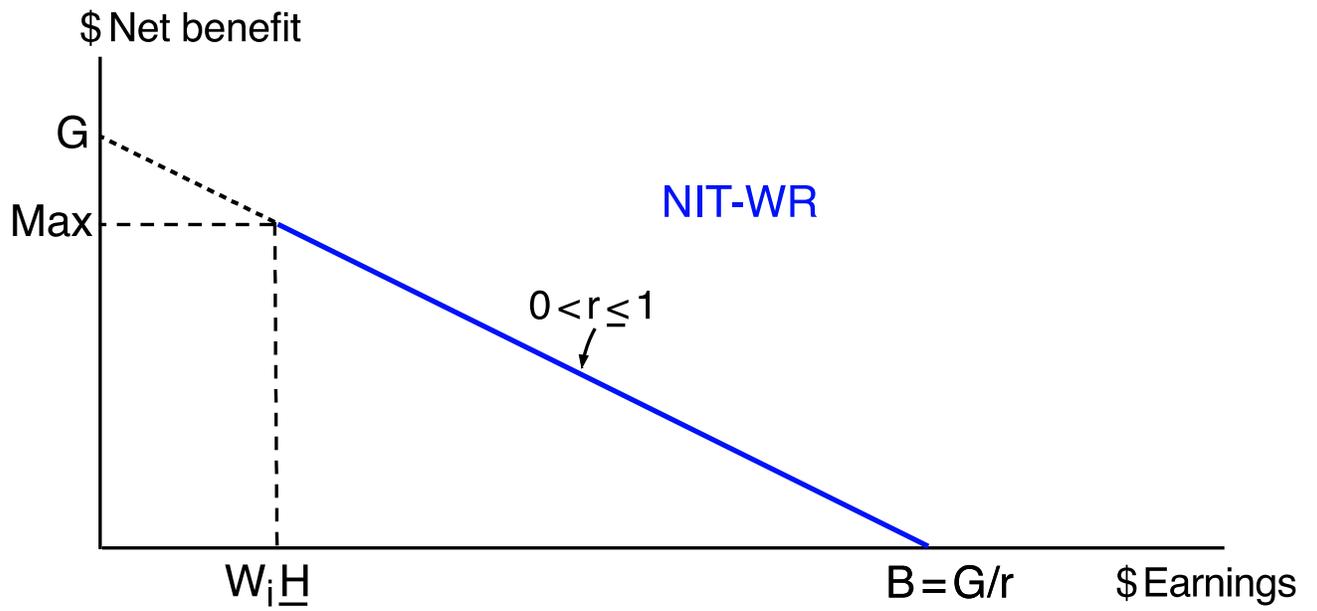
**Figure 2**

*Formats for Income Assistance with Flat and Proportionate Earnings Exemptions*

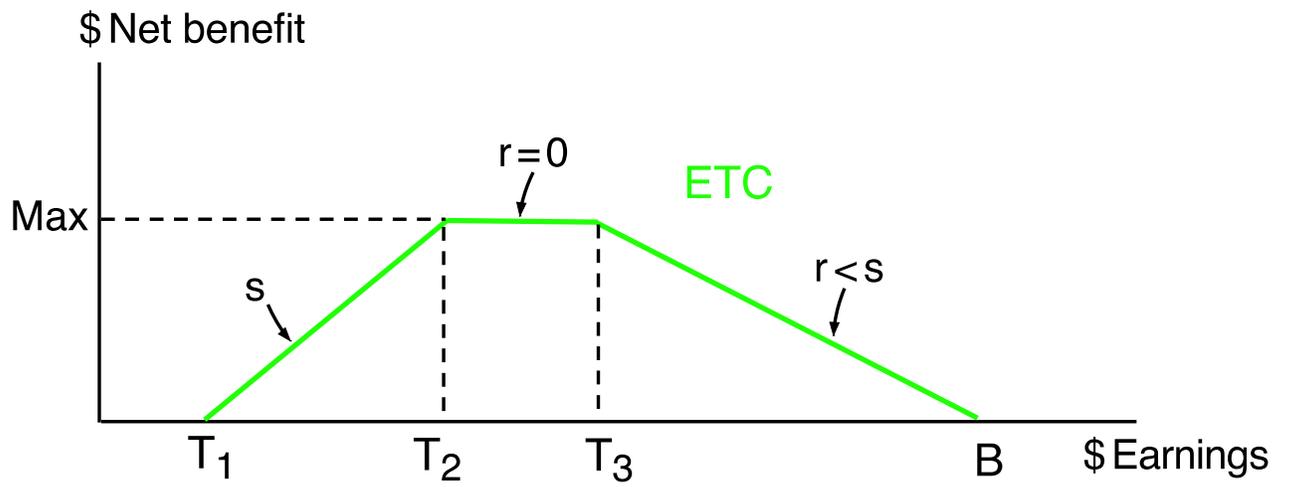


**Figure 3**

*Format for Negative Income Tax with Work Requirement*

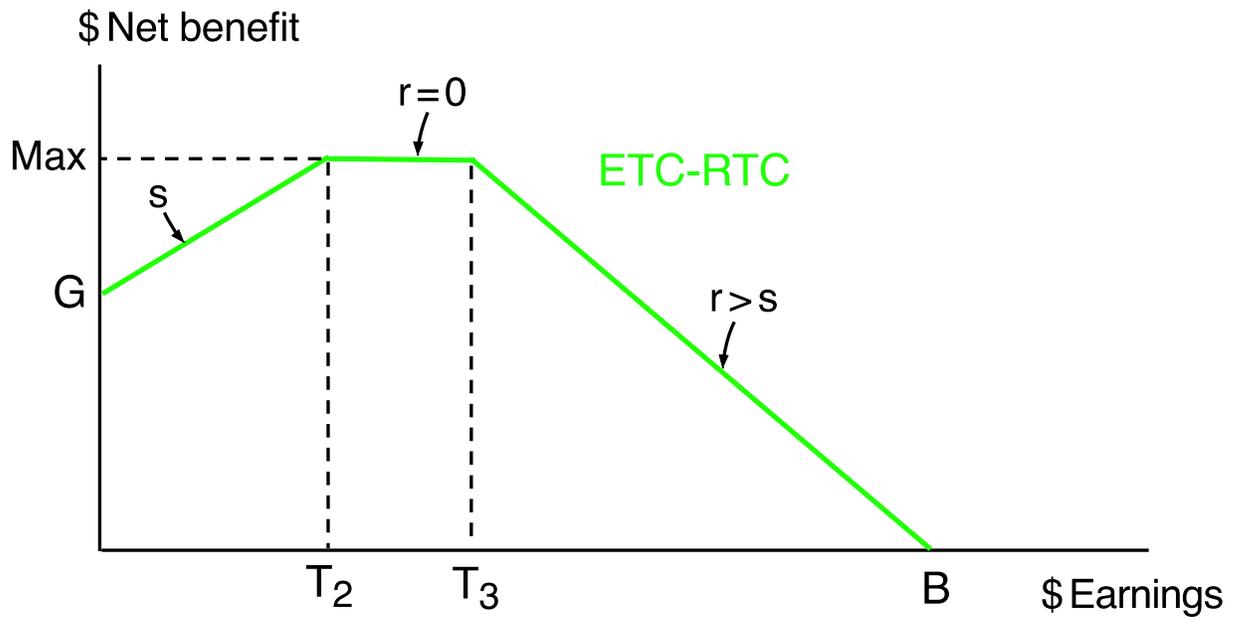


**Figure 4**  
*Format for Employment Tax Credit*

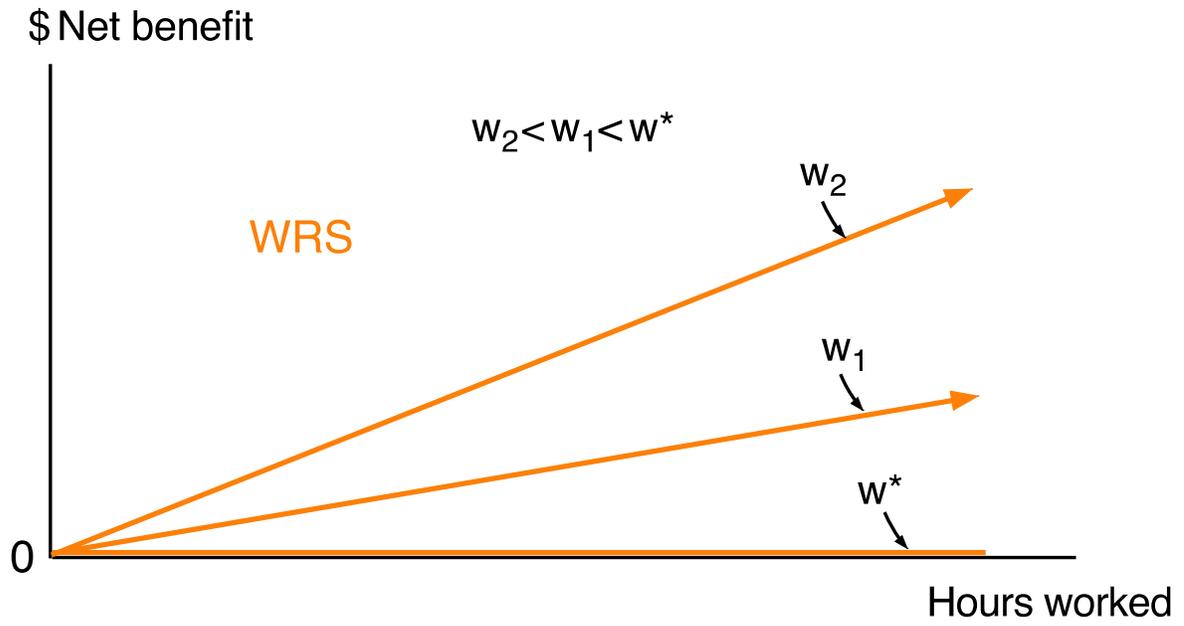


**Figure 5**

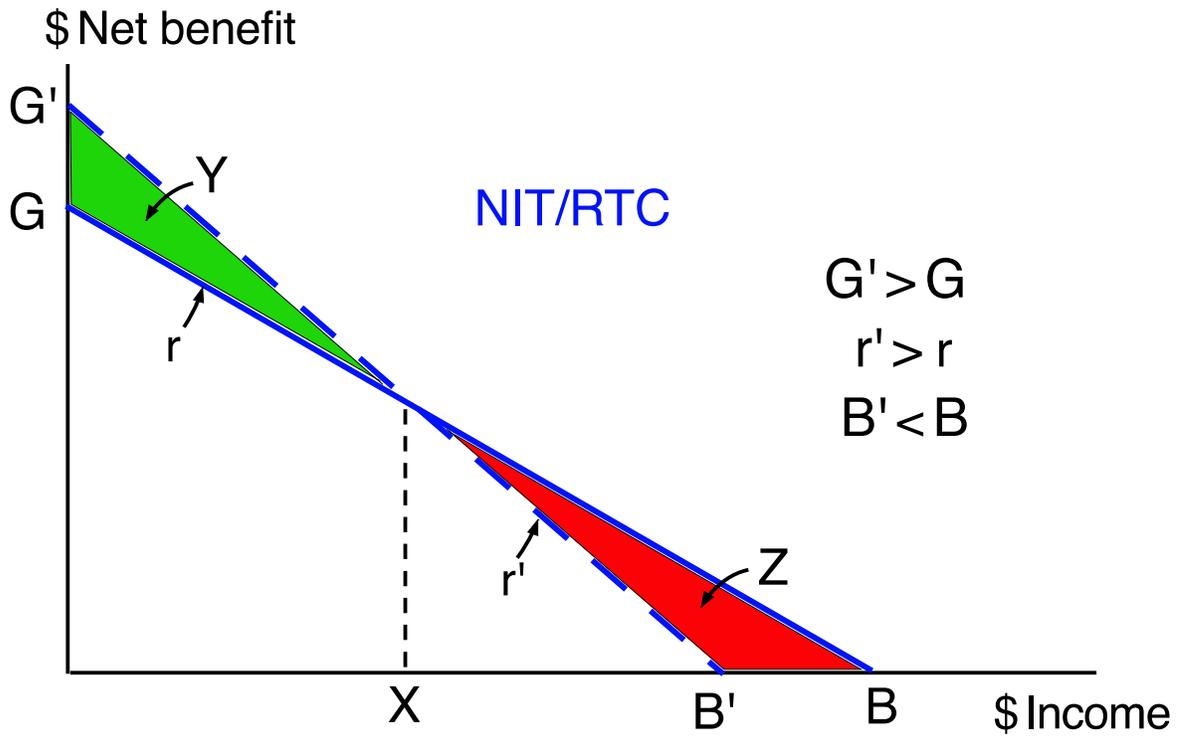
*Format for Employment Tax Credit with Refundable Tax Credit*



**Figure 6**  
*Format for Wage Rate Subsidy*

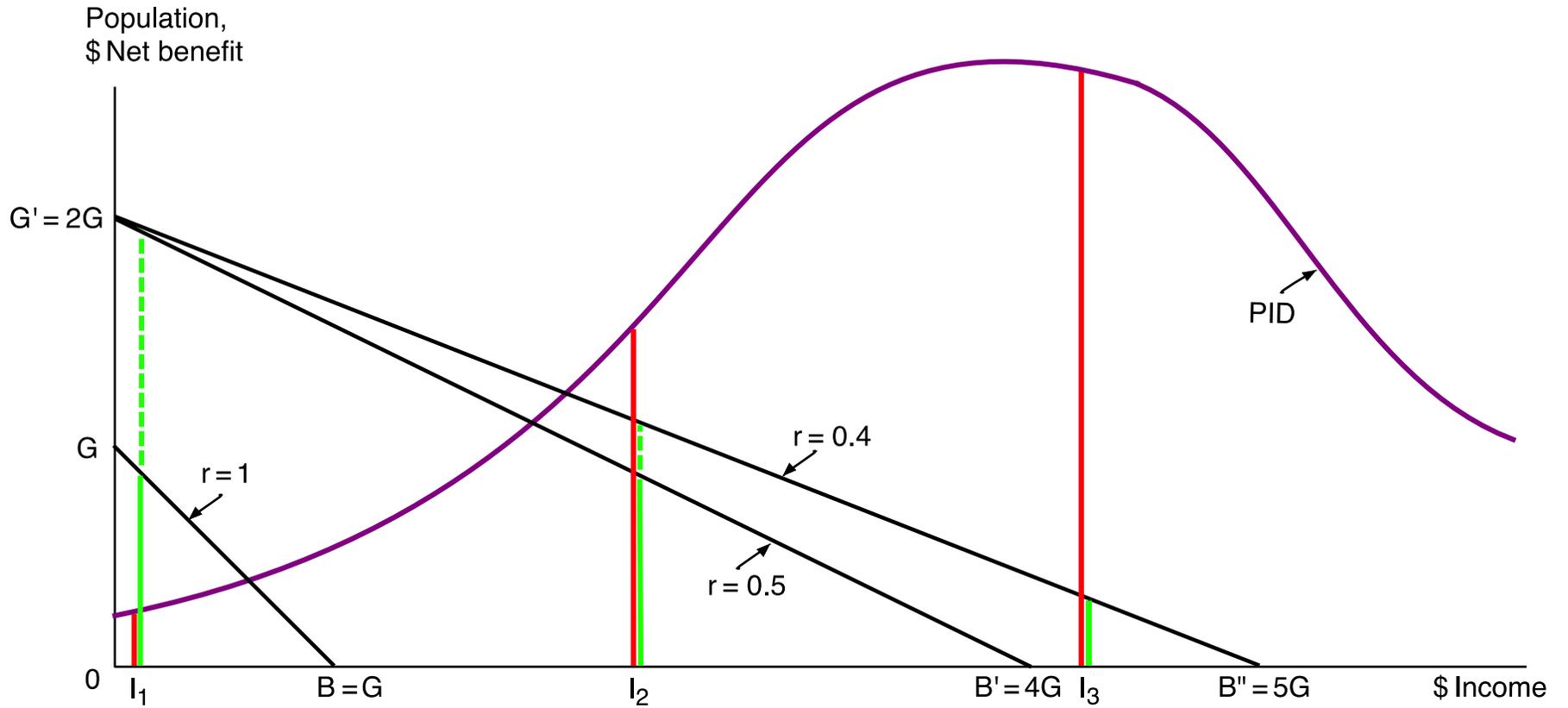


**Figure 7**  
*Constant-Cost Variation for NIT/RTC*

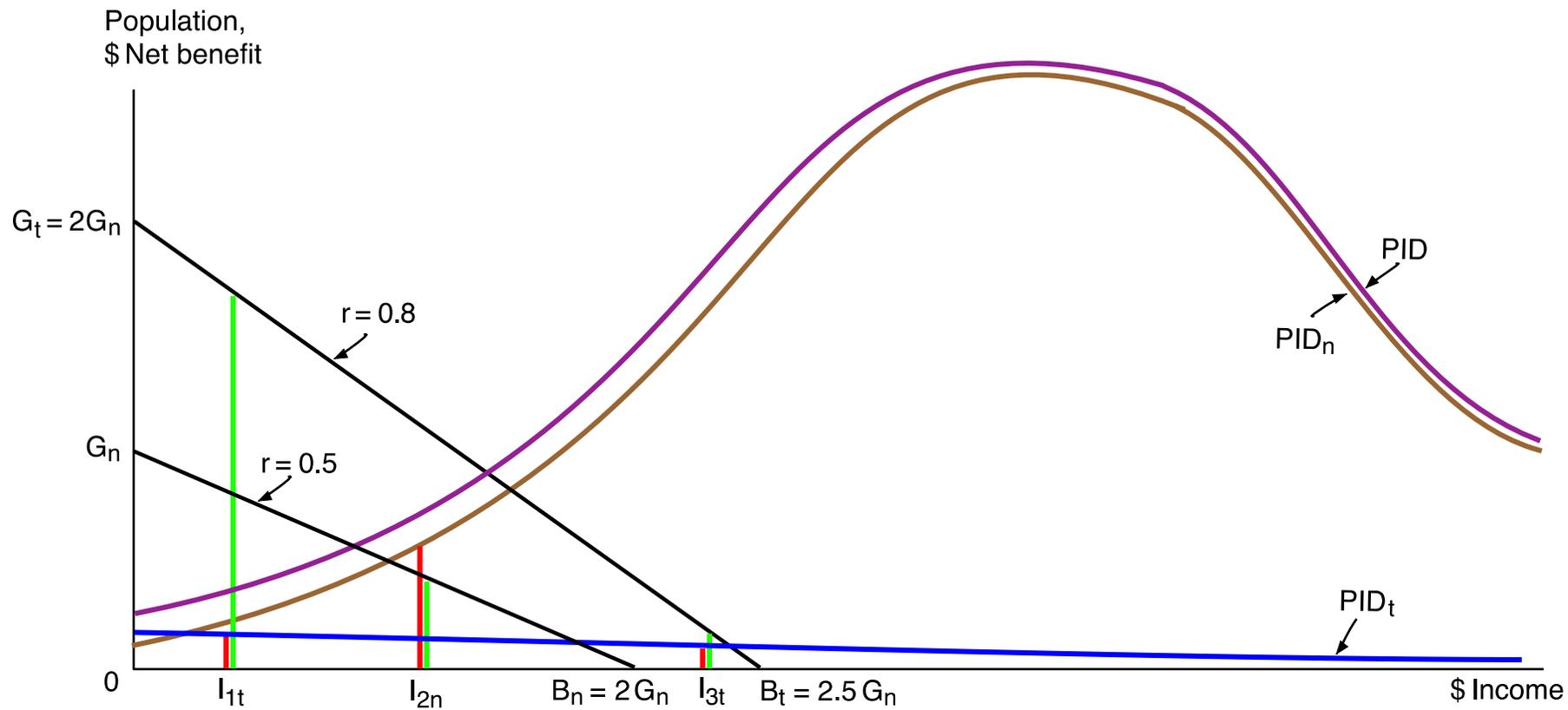


**Figure 8**

*Budgetary Cost Impact of Increased Guarantee and Reduced Tax-Back Rate for NIT/RTC*

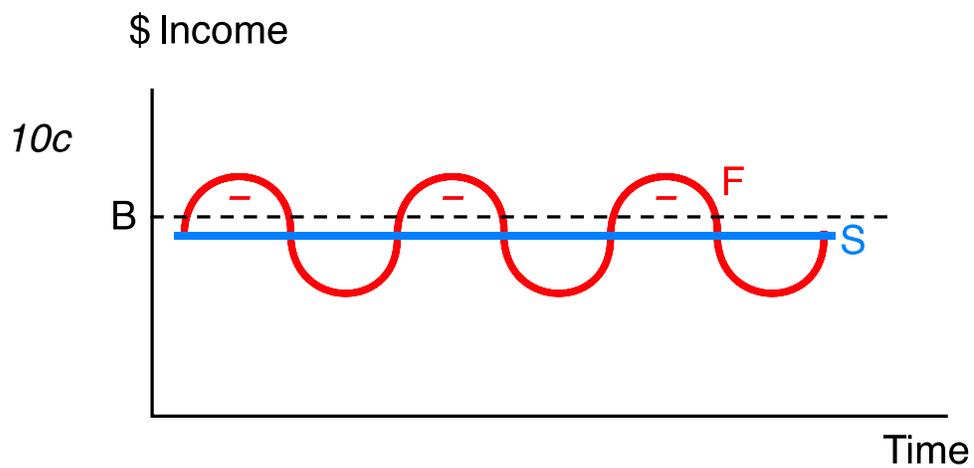
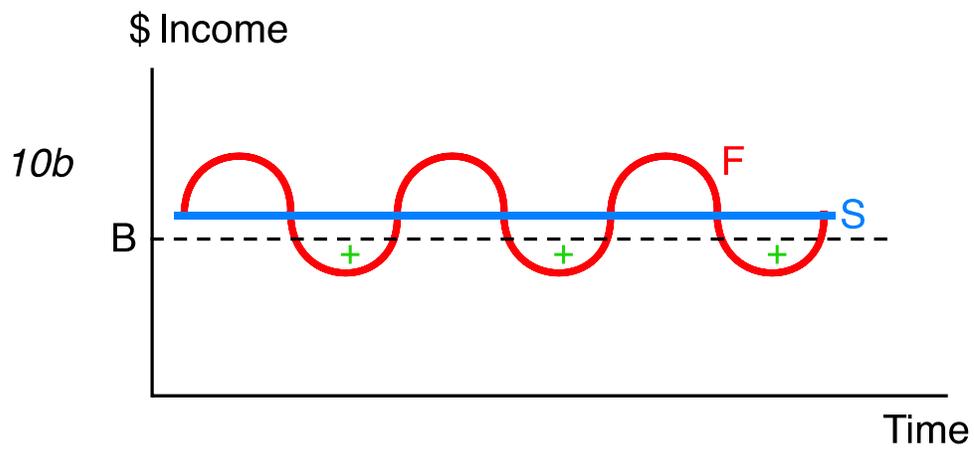
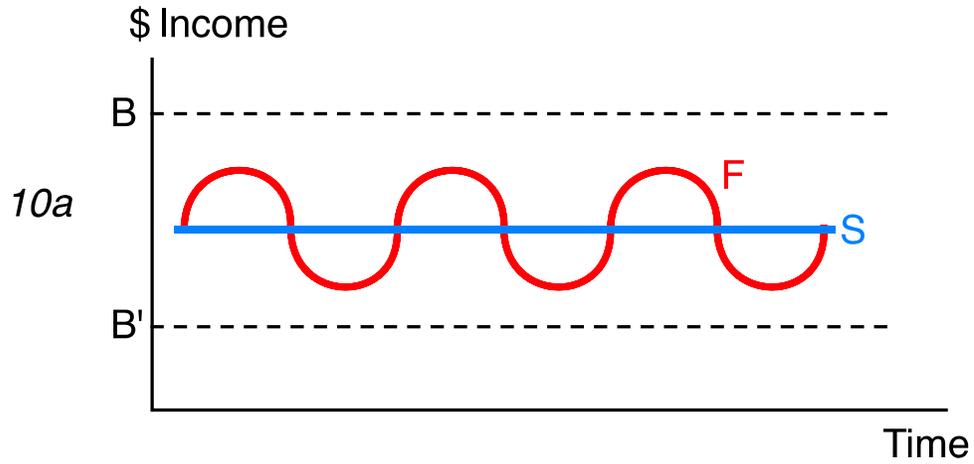


**Figure 9**  
*Budgetary Cost Impact of Categorical Targeting in NIT/RTC*



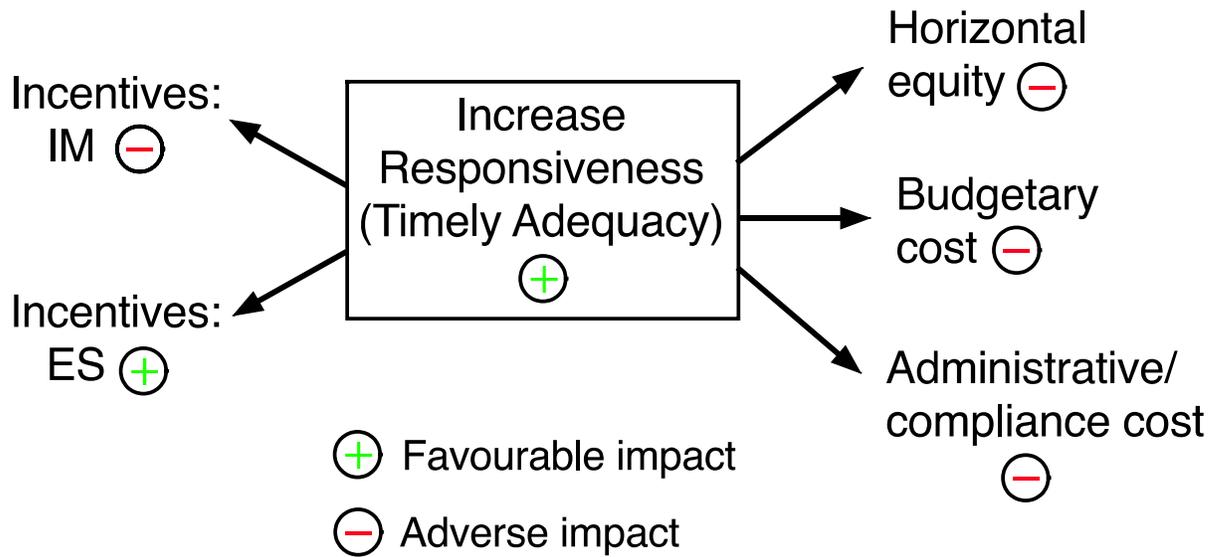
**Figure 10**

*Comparison of RTC/NIT Benefits for Fluctuating and Stable Incomes under Periodic and Annual Accounting*



**Figure 11**

*Impacts of Benefit Accounting with Increased Benefit Responsiveness*



**Figure 12**  
*NIT with In-Kind Benefit and "Cliff"*

