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**Communiqué**

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# *Rising marginal tax rates hurting seniors, low-income Canadians, says C.D. Howe Institute study*

Rising marginal tax rates (the rates levied on each additional dollar of taxable income), partly as a result of the partial de-indexation of personal income tax brackets starting in 1986, are hurting low-income Canadians, concludes a *C.D. Howe Institute Commentary* released today.

The study, *Marginal Tax Rates in Canada: High and Getting Higher*, was written by James B. Davies, a professor in the Department of Economics at the University of Western Ontario.

Davies notes that the personal income tax is not the only determinant of marginal tax rates. Canadians also bear many other taxes, including:

- sales and excise taxes;
- the taxback of social assistance benefits from recipients who earn more than a small amount;
- contributions to unemployment insurance and the public pension plans; and
- the clawback of certain federal social transfers — the goods and services tax (GST) credit, the child tax benefit, and various benefits for seniors — over a range of income levels.

In 1994, these taxes, added to the personal income tax, brought the average marginal tax rate by one measure to almost 51 percent. It has likely risen since. Such high average marginal tax rates tend to be harmful, Davies says, because they are disincentives to work, save, and invest.

Davies argues that Canadians who suffer most from high marginal tax rates are those in low-income groups, especially couples with a single earner — because such couples are not eligible for the child-care expense deduction or the extra GST credit for single adults. Also, low-wage earners struggling with the transition from welfare to work are often confronted with a social assistance taxback stacked on top of the income tax liability associated with their next dollar of employment income.

Low-income seniors also suffer from high marginal tax rates, Davies says. The current taxback rate on their benefits discourages pre-retirement saving. And their situation will be worsened when the seniors benefit replaces current seniors' programs because the clawback will be at a higher rate and start at a lower income level.

Davies says Canadian governments could take a number of steps to alleviate inequity and inefficiency without harming other aspects of the economy:

- reduce social assistance taxback rates;
- restore the personal income tax brackets and credits to their historic real-dollar values and resume full indexation; and,
- as soon as possible, reduce federal personal income tax rates, starting with the lowest, which is now 17 percent.

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# *Communiqué*

**Embargo : à diffuser le *mercredi* 18 mars 1998**

# *La hausse des taux marginaux d'imposition nuit aux personnes âgées et aux Canadiens à faible revenu, indique une étude de l'Institut C.D. Howe*

La hausse des taux marginaux d'imposition — les taux prélevés sur chaque dollar supplémentaire de revenu imposable — nuisent aux Canadiens à faible revenu, en partie à cause de la désindexation partielle des tranches d'imposition sur le revenu des particuliers qui a commencé en 1986. Telle est la conclusion d'un *Commentaire de l'Institut C.D. Howe* publié aujourd'hui.

L'étude, intitulée *Marginal Tax Rates in Canada: High and Getting Higher (Les taux marginaux d'imposition au Canada : élevés et en hausse),* est rédigée par James B. Davies, un professeur du département d'économique de l'University of Western Ontario.

M. Davies indique que l'impôt sur le revenu des particuliers n'est pas le seul facteur déterminant des taux marginaux d'imposition. Les Canadiens sont assujettis à plusieurs autres taxes et impôts, dont notamment les suivants :

- les taxes de vente et d'accise;
- la réimposition des prestations d'assistance sociale pour les bénéficiaires qui gagnent plus qu'un montant modeste;
- les cotisations à l'assurance-emploi et aux régimes publics de pension;
- la disposition de récupération de certains transferts sociaux du fédéral — comme le crédit pour taxe sur les produits et services (TPS), la prestation fiscale pour enfants et diverses prestations pour les personnes âgées — sur toute une gamme de niveaux de revenus.

En 1994, ces taxes, ajoutées à l'impôt sur le revenu des particuliers, portaient selon une mesure, le taux marginal d'imposition moyen à près de 51 %. Il est probable que ce chiffre a augmenté depuis; or, des taux marginaux d'impôt aussi élevés ont tendance à nuire, explique M. Davies, car ils constituent des contre-incitations au travail, à l'épargne et aux placements.

L'auteur soutient que les Canadiens qui souffrent le plus des taux marginaux d'imposition élevés se trouvent parmi les groupes à faible revenu, particulièrement les couples où un seul des conjoints travaille — car ces derniers ne sont pas admissibles à la déduction pour frais de garde d'enfant ou au crédit supplémentaire pour la TPS offert aux adultes célibataires. Par

ailleurs, les gagne-petit qui sont aux prises avec le passage de l'assistance sociale au travail sont souvent confrontés à une récupération des prestations d'assistance sociale en sus de l'obligation d'impôt sur le revenu associée à leur prochain dollar de revenu d'emploi.

Les personnes âgées à faible revenu sont également éprouvées par les taux marginaux d'imposition élevés, indique M. Davies. Le taux présent de réimposition de leurs prestations n'encourage pas l'épargne pré-retraite. Et leur situation va empirer lorsque les prestations aux personnes âgées vont remplacer les programmes actuels offerts aux personnes âgées, car le taux de réimposition sera plus élevé, et commencera à un niveau de revenu plus bas.

M. Davies indique que les gouvernements au pays pourraient prendre un certain nombre de mesures pour soulager l'iniquité et les inefficiences sans pour cela nuire à d'autres aspects de l'économie, dont :

- la diminution des taux de réimposition des prestations d'assistance sociale;
- le rétablissement des tranches d'impôt sur le revenu des particuliers ainsi que les crédits à des valeurs historiques en dollars réels et la restitution d'une indexation intégrale;
- la réduction dès que possible des taux d'impôt fédéral sur le revenu des particuliers, en commençant par le taux le plus bas, qui est de 17 %.

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# Marginal Tax Rates in Canada:

## High and Getting Higher

by

*James B. Davies*

Complaints about high Canadian tax rates are frequent. Are they justified? One way to consider the matter is to look at marginal tax rates — the percentage of the last dollar of an individual's income that is paid out in taxes. High rates can harm the economy by discouraging individuals, especially those with low incomes, from working and by dissuading higher-income individuals from saving or investing. Why bother if the effort nets them little or nothing?

The conclusion is that Canadians faced an average marginal tax of about 51 percent in 1994 (the base year studied). Since then, that amount has probably risen a little, and it will increase significantly over the next few years as a result of the rising contribution rates for the Canada and Quebec Pension Plans and of the introduction of the new seniors' benefit with its greatly strengthened clawback.

To offset some of the damage of high marginal tax rates, Canadian governments should reduce social assistance taxback rates (50 percent should be a long-run goal), immediately restore income-tax brackets and credits to the real values they had in 1987 and keep them fully indexed, and, as soon as possible, reduce the bottom rate for the federal personal income tax.

## *Main Findings of the Commentary*

- Marginal tax rates (MTRs) are the rates levied on each additional unit of taxable income. The average marginal tax rate (AMTR) has increased greatly in Canada since 1950.
- High AMTRs tend to be inefficient for society because they provide disincentives for work effort, saving, and investment.
- AMTRs can be measured in two ways: weighted by the number of tax returns ("overall, equally weighted AMTRs") and weighted by income ("income-weighted AMTRs"). Both are used here, but the income-weighted measure is more useful in considering tax-system efficiency.
- The AMTR for the personal income tax (PIT), federal and provincial, has trended upward since 1950. The income-weighted measure reached 36.5 percent in 1994 (the base year for this study).
- In general, AMTR fluctuations reflect two factors: changes in tax rates and brackets, and changes in individuals' incomes. In Canada, the partial de-indexation of PIT brackets starting in 1986 has had a continuing effect. So have cyclical changes in the economy.
- Canadians also bear many taxes that are not PITs. They include sales and excise taxes; the taxback of social assistance benefits from recipients who earn more than a small amount; contributions to unemployment insurance and the public pension plans; and the clawback of certain federal social transfers — the goods and services tax (GST) credit, the child tax benefit, and various benefits for seniors — over a range of income levels. Overall, these non-PIT taxes added about fourteen percentage points to the 1994 income-weighted AMTR, taking it to almost 51 percent. It has likely risen since.
- Canadians who suffer most from high MTRs are those in low-income groups, especially couples with a single earner (because they are not eligible for the child-care expense deduction or the extra GST credit for single adults and the income level at which the earner must pay PIT widely overlaps the usual social assistance taxback). The work disincentives are large.
- Low-income seniors also suffer from high MTRs. The current taxback rate on their benefits discourages pre-retirement saving. And their situation will be worsened when the seniors benefit replaces current seniors' programs because the clawback will be at a higher rate and start at a lower income level.
- Canadian governments could take a number of steps to alleviate this inequitable, inefficient situation without harming other aspects of the economy: reduce social assistance taxback rates; restore the PIT brackets and credits to the real-dollar values they had at the time of the 1987 tax reform and fully index them again; and, as soon as possible, reduce federal PIT rates, starting with the lowest, which is now 17 percent.

The growth of government over the post-war period has led to a large increase in average tax rates. In 1950, total tax revenue in Canada stood at 21 percent of gross domestic product (GDP); by 1995, the proportion had risen to 38 percent. Was this increase accomplished equitably? efficiently?

One means of beginning to answer such questions is to look beyond changes in average tax rates to marginal tax rates (MTRs), the rates levied on each additional unit of taxable income. A handy way of summarizing this behavior is to examine the evolution of the average marginal tax rate (AMTR) over time, which is the first task I undertake in this *Commentary*.

How do AMTRs throw light on equity issues? They provide an overview of how the progressivity of a tax system has been changing. The ratio of the marginal tax rate to the average tax rate at a point on the tax schedule is a well-known measure of progressivity. Correspondingly, the ratio of the AMTR to the overall average tax rate is a useful summary measure of overall progressivity. For the personal income tax (PIT) system in Canada, this ratio decreased from 2.3 to 1.7 over the 1978–89 period and has remained fairly steady since. Although this reduction in progressivity has been more than offset by changes in transfer payments,[1] it is nonetheless of interest.

As for efficiency, if marginal rates rise but the average rate remains unchanged, a tax system becomes more distortionary. Disincentive effects on work effort, saving, and investment tend to be exacerbated, phenomena that are reflected in an increase in measures of the taxation's "deadweight loss" or "excess burden" (the amount by which an individual's true tax burden — the amount he would have to receive to make him just as well off with the tax as without it — exceeds the tax paid). Al-though, as Dahlby emphasizes,[2] thinking about changes in average tax rates is necessary to get a complete assessment of the welfare effects of taxation, tracking the behavior of marginal tax rates is key to understanding the changing distortionary impacts of taxes over time.

The basic statistical analysis of this *Commentary* has two parts. The first (presented in the first section) estimates federal plus provincial PIT AMTRs for the 1947–94 period. The second (presented in the next section) augments the first by bringing in MTRs from other federal and provincial taxes and from contributions to unemployment insurance (UI) and the Canada and Quebec Pension Plans (CPP / QPP) for 1994 alone. Both the contribution of these other MTRs to an overall AMTR and the pattern of MTRs across income groups are then estimated for 1994.

The method used takes a weighted average across income groups of the statutory MTRs (adjusted for any tax rebates or surtaxes) faced by the representative taxpayer in each group. (See Box 1 for more detail.)

This taking of an average of the true tax wedges applying to income (as measured for income tax purposes) provides the right approach for considering the work-disincentive impact of MTRs, a central area of concern. (To assess disincentive effects on saving and investment, one should, however, compute the effective MTRs that apply to real accruing capital income rather than realized nominal capital income, and consider corporate as well as personal income tax; see Box 2.)

Two alternative measures of the AMTR are provided: one that weights the MTRs in different income groups by the number of returns and results in what I call "equally weighted AMTRs," and one that weights according to income, yielding "income-weighted AMTRs." In general, my preferred approach is to weight by income. On that basis, I estimate the AMTR for federal plus provincial PIT to have risen from 12.2 percent in 1950 to 36.5 percent in 1994.

The second section of the *Commentary* demonstrates that the AMTR needs to be revised considerably when non-PIT taxes falling

**Box 1:** ***Methods Used***

The series of average marginal tax rates (AMTRs) for federal and provincial personal income taxes (PITs) that is presented here is Davies and Zhang's 1947–91 series[a] extended through 1994, the last year for which data are currently available.

The method, which follows that pioneered by Barro and Sahasakul in the United States,[b] uses grouped data published annually by Revenue Canada,[c] an approach that allows consistent estimates to be made for a long time period. The AMTRs are averages of the statutory marginal tax rates (adjusted for tax reductions, rebates, and surtaxes) faced by the person with average characteristics in each income group. Persons who did not pay tax are placed in a separate group.

The estimates are close to unpublished estimates by the federal Department of Finance for the period since 1988 using micro data. The Finance numbers, which weight taxpayers equally, rather than by income, give an average federal AMTR of 23.2 percent for the 1988–94 period, compared with the average of 22.3 percent found here. The difference, which is fairly constant from year to year, results from grouping error. The fact that the gap between the two series is stable suggests that the numbers reported in this *Commentary* can be taken as a good guide to year-to-year changes in the AMTR.

The calculations for the provincial PITs are stylized, a legitimate procedure because they follow the federal structure fairly closely (all provinces except Quebec being bound by the provisions of the tax collection agreements). Thus, I obtained estimates of federal plus provincial PIT AMTRs simply by inflating the federal AMTRs by the ratio of provincial to federal PIT collections. (Attempting to perform a detailed treatment of provincial PIT for each year in the period would be a huge task, and one beyond the scope of this *Commentary*.[d])

*a* James B. Davies and Junsen Zhang, "Measuring Marginal Income Tax Rates for Individuals in Canada: Averages and Distributions over Time," *Canadian Journal of Economics* 29 (November 1996): 959–975.

*b* R.J. Barro and C. Sahasakul, "Measuring the Average Marginal Rate from the Individual Income Tax," *Journal of Business* 56 (4, 1983): 419–452; idem, "Average Marginal Tax Rates from Social Security and the Individual Income Tax," *Journal of Business* 59 (4, 1986): 555–566.

*c* Revenue Canada, *Taxation Statistics* (Ottawa), tables 2 and 2A.

*d* For a careful study of 1986 and 1993 marginal and average tax rates that takes provincial effects into account fully, see Bev Dahlby, "The Distortionary Effect of Rising Taxes," in William B.P. Robson and William M. Scarth, eds., *Deficit Reduction: What Pain, What Gain?* Policy Study 30 (Toronto: C.D. Howe Institute, 1994). Aspects of provincial PIT MTRs are also examined in Roger S. Smith, "The Personal Income Tax: Average and Marginal Rates in the Post-War Period," *Canadian Tax Journal* 43 (5, 1995): 1055–1076.

on personal income and expenditure are taken into account. The required upward revision, of about fourteen percentage points, takes the total 1994 AMTR to almost 51 percent. The welfare implications of taxing income at such a high marginal rate may be very serious.

Consider the deadweight loss that would result from collecting an additional dollar in revenue if all labor income were already taxed at this 51 percent rate rather than collecting that dollar via a nondistortionary (that is, lump-sum) tax. Using typical assumptions from the literature, I calculate this unnecessary marginal cost of taxation as $0.45 per dollar of extra revenue. This result suggests that Canada could have substantial efficiency benefits from reducing the level of marginal tax rates.

The focus of the *Commentary* changes in the third section, which looks at how total MTRs vary by income level. Contrary to what is often believed, they are highest for the *lowest* income groups in Canada and roughly constant (with some bumps) across middle- and upper-income groups.

The next section examines the impact of current and announced future modifications to the federal tax system, including changes in the child tax benefit (CTB) and the CPP / QPP, and the replacement of the old age security and guaranteed income security (OAS / GIS) system by the new seniors benefit (SB). These changes will raise the overall AMTR by a further two to three percentage points.

When one adds in the effects of bracket creep (since the PIT system is only partially in-

**Box 2:** ***AMTRs on Capital Income***

The AMTRs studied here are those levied on currently assessed nominal income at the personal level, rather than comprehensive accruing real income. Taxation of much investment income is deferred — for example, through the taxation of capital gains on a realization rather than accrual basis — which lightens effective tax burdens (although, in periods of inflation, taxed investment income tends to exceed true investment income since it includes a purely inflationary component, raising true effective marginal tax rates.[a])

Also, capital income is subject to taxes, such as the corporate income tax, that are not levied at the personal level. Ultimately such taxes are borne by households.

Effective marginal tax rates (EMTRs) on capital income vary, of course, greatly across industries and types of capital. They also vary depending on the assumptions researchers use.[b] Boadway, Bruce, and Mintz report average EMTRs for the 1972–78 period from the personal and corporate tax systems of 40 and 23 percent, respectively, for a total of 63 percent; Daly and Jung provide estimates ranging from 38 to 49 percent; McKenzie and Mintz report a figure of 48 percent.[c]

For comparison, the total ordinary AMTR on assessed income I report here for 1994 is almost 51 percent, including sales and excise taxes. If the latter were included as a burden to be incurred when capital is spent, then the McKenzie and Mintz number would suggest a total marginal tax rate on capital income of about 57 percent.

*a* For an analysis of such effects, see James B. Davies and Graham Glenday, "Accrual Equivalent Marginal Tax Rates for Personal Financial Assets," *Canadian Journal of Economics* 23 (1, 1990): 189–209.

*b* See Robin Boadway, "The Theory and Measurement of Effective Tax Rates," in Jack M. Mintz and Douglas D. Purvis, eds., *The Impact of Taxation on Business Activity* (Kingston, Ont.: Queen's University, John Deutsch Institute for the Study of Economic Policy, 1987).

*c* Robin Boadway, Neil Bruce, and Jack Mintz, "Taxation, Inflation, and the Effective Marginal Tax Rate on Capital in Canada," *Canadian Journal of Economics* 17 (1, 1984): 77–78; Michael J. Daly and Jack Jung, "The Taxation of Corporate Investment Income in Canada: An Analysis of Marginal Effective Tax Rates," *Canadian Journal of Economics* 20 (3, 1987): 569; Kenneth J. McKenzie and Jack M. Mintz, "Tax Effects on the Cost of Capital," in John B. Shoven and John Whalley, eds., *Canada-U.S. Tax Comparisons*, NBER Research Report (Chicago and London: University of Chicago Press for the National Bureau of Economic Research, 1992).

dexed), the implication is that the AMTR in Canada will be heading toward the 55 percent range by the early years of the next century. The marginal deadweight loss from taxing all labor income at this marginal rate will be about $0.58 per dollar of additional revenue, and the changes will do little to alter the pattern of MTRs across income groups.

Thus, on both efficiency and equity grounds, these anticipated trends are a serious concern. The *Commentary* concludes by recommending that they be offset by using a portion of the expected fiscal dividend to restore to their real 1988 value, and re-index tax brackets, exemptions, and credits. In addition, all levels of government should, as far as possible, reduce the high marginal tax rates at low income levels caused by benefit clawbacks and by employment insurance (EI) and CPP/QPP contributions. As the fiscal situation improves and further tax cuts become possible, a good place to start would be by reducing the federal PIT rate in the lowest bracket.

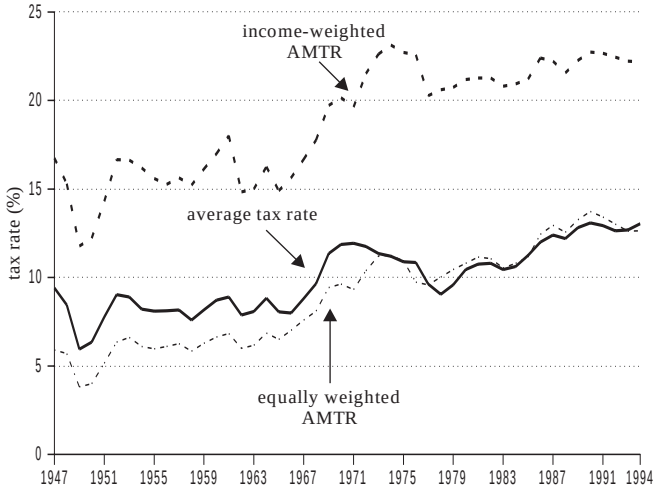
## AMTRs from the PIT

Figure 1 sets out the estimates of the AMTR — one series weighted by income, the other by number of returns — and of the average tax rate under the federal PIT over the 1947–94 period

Both AMTR measures show fluctuations throughout the 47-year period. No discernible trend appeared before the mid-1960s, but rates then rose sharply until the mid-1970s, fell briefly from 1974 to 1977, trended upward 1990, and declined slightly through 1994.

Looking at federal marginal tax rates alone tells an incomplete story, however. Until 1962, the bulk of PIT collections in Canada were at the federal level, but since then the shift toward provincial income taxes has been large.

**Figure 1:** ***Federal Tax Rates, 1947–94***




Sources: 1947–91: James B. Davies and Junsen Zhang, "Measuring Marginal Income Tax Rates for Individuals in Canada: Averages and Distributions over Time," *Canadian Journal of Economics* 29 (November 1996): 959–975; 1992–94: author's calculations.

With provincial PITs taken into account, an upward trend in the AMTRs is apparent in almost all periods (see Figure 2). This trend was mild up to the mid-1960s but very strong from then until the mid-1970s. From the mid-1970s to 1990, the upward trend was moderately strong for the equally weighted measure but mild for the income-weighted measure. After 1990, the upward trend continued for the latter, although, as in the case of federal PIT, the equally weighted measure of the AMTR fell a little. The 1994 value for the income-weighted measure was 36.5 percent.

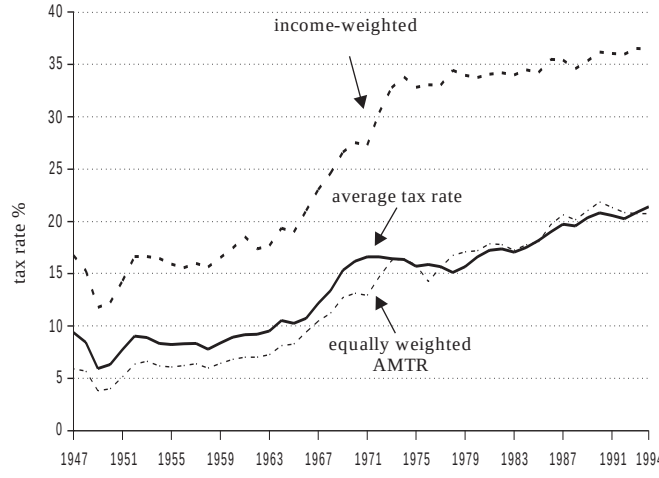
Which measure is better: weighting by the number of returns or by income? If the goal is to use the AMTR as an input in thinking about the deadweight losses created by the tax system, weighting by income makes sense. A given marginal tax rate may be just as unwelcome to a worker earning $10 an hour as to one earning $20 an hour. If, however, they are both working about the same number of hours per week and have similar elasticity in their labor supply response to taxes, then the deadweight loss experienced by the higher earner is about twice that of the low earner. So for anyone thinking about efficiency when looking at AMTRs, weighting by income is appropriate.

## *The Reforms of 1987*

Davies and Zhang comment on the reasons for the fluctuations in AMTRs over the 1947–91 period,[3] so here I concentrate on changes since the tax reform exercise of 1987, which had its first effects in the 1988 tax year.

In general, AMTR fluctuations can be explained by two factors: changes in rates and brackets on the one hand, and changes in individuals' incomes on the other. Increases in real income always tend to push taxpayers into higher brackets, and purely inflationary income rises have the same effect if indexation of the tax system is less than full, as has been the case in Canada since 1986. (Income declines, of course, have the opposite effect.)

**Figure 2:** ***Federal Plus Provincial Tax Rates, 1947–94***




Sources: 1947–91: James B. Davies and Junsen Zhang, "Measuring Marginal Income Tax Rates for Individuals in Canada: Averages and Distributions over Time," *Canadian Journal of Economics* 29 (November 1996): 959–975; 1992–94: author's calculations.

Since the 1987 tax reform took effect, taxable individuals in Canada have faced three official federal MTRs: 17, 26, and 29 percent. Income brackets have risen slightly in nominal dollars, but because they have not been indexed for the first three percentage points of inflation, each has declined significantly in real terms — by a total of 10.6 percent over the 1988–94 period. This erosion has pushed many lower- and middle-income earners into higher tax brackets. Indeed, the Organisation for Eco-nomic Co-operation and Development (OECD) forecasts that, in the ten years after 1988, inflation will have made 18 percent of taxfilers either taxable for the first time or members of a higher tax bracket.[4]

The initial impact of the 1987 tax reform was to reduce AMTRs. The income-weighted federal AMTR fell from 22.2 percent in 1987 to 21.6 percent in 1988, for example. In 1989 and 1990, however, all the AMTRs rose again, as the strong economic growth of the late 1980s pushed people into higher tax brackets. The number facing a zero MTR fell from 7.6 million in 1988 to 7.2 million in 1990, for example. The increase in AMTRs was also, to a small extent, the result of increases in federal surtax in 1990 and 1991.[5]

In the 1990s, provincial PIT rates increased relative to federal rates, with provincial revenues rising from 59.1 percent of federal revenues in 1990 to 64.3 percent in 1994. Federal surtaxes fell after 1991, however, and the 1991–92 recession hit some taxpayers hard, pushing them back down into lower tax brackets.[6] The result was that both federal AMTRs and the equally weighted federal plus provincial AMTR fell in 1991 and 1992 and stayed more or less flat in 1993 and 1994 with slow recovery from the recession.

In contrast to these trends, the income-weighted federal plus provincial AMTR showed a definite, if mild, upward trend over the 1988–94 period. The reason was twofold: provincial tax rates continued to rise, and the income-weighted measure is less sensitive to a drop in MTRs than the equally weighted measure for those low-income earners whose position worsened over these years.

This analysis of trends since 1987 brings out an important point about AMTRs: their behavior over time is not just a reflection of features of the tax system. It also depends on the state of the economy and on the distribution of pre-tax income. Especially since the Canadian tax system is only partially indexed for inflation, AMTRs tend to rise in good times even if there is no change in the tax system, and the opposite may occur in bad times. The 1988–94 period exhibited a slowly changing tax system but sharp changes in the state of the country's economy, and the latter had an important effect on AMTRs.

Given the continuing occurrence of bracket creep and the strong recent growth of the Canadian economy, it is likely that all the AMTRs studied here have risen since 1994.

## *Disincentives*

The AMTRs discussed in this section provide an indication of the disincentive effects of the PIT. As mentioned earlier, these AMTRs are most applicable for labor income. If the demand for labor is infinitely elastic, the marginal deadweight loss (MDWL) per dollar of revenue raised by taxing labor income at a constant marginal rate is given by the formula

$$\text{MDWL} + 1 = 1 / [1 - em / (1 - m)],$$

where $e$ is the compensated elasticity of labor supply and $m$ is the marginal tax rate.[7] Of course, the PIT should not be considered in isolation (the next section will show the difference made by adding in other taxes and contributions). This formula can, however, be applied to get some idea of the contribution made by PIT alone toward marginal deadweight losses.

A rough estimate of the average value of this MDWL across all taxpayers can be ob-

tained by plugging in my AMTRs as *m* and setting *e* at 0.3, a typical value in exercises such as this one.[8] The result for 1950, when the AMTR was 12.2 percent, is an estimated MDWL from the PIT of just $0.04. By 1994, when the PIT AMTR was 36.5 percent, the MDWL had reached $0.21.

These figures reflect the fact that deadweight losses increase more than in proportion to tax rates, which is one of the reasons efficiency concerns are especially important in a country that faces marginal tax rates at the level observed in Canada today.

### *Progressivity*

Finally, can these numbers tell us anything about changes in progressivity over the postwar period? The answer is yes. The ratio of the marginal to the average tax rate, MTR / ATR, provides the percentage change in tax liability resulting from a 1 percent increase in income, a measure of liability progression at a point on the tax schedule.[9] The overall ratio of AMTR to ATR for all taxpayers taken together gives a measure of average progressivity of the whole PIT system. By this indicator, progressivity was roughly constant in Canada from 1947 to 1966, with AMTR / ATR hovering in the range of 1.8 to 2.0. The ratio fell quite sharply from 1966 to 1971, dropping to 1.6, but it then in-creased, reaching 2.3 in 1978. From 1978 to 1989, it fell again, to 1.7, where it stayed until 1994.

The decline in progressivity in the latter period was partly a reflection of a shift toward greater reliance on expenditure to achieve the redistributive aims of government (for example, via refundable tax credits).

## MTRs from Other Taxes

Although it is interesting to see what has been happening to AMTRs under Canadian PITs, many other features of the country's tax system and social insurance schemes — unemploy-ment (now employment) insurance and the CPP / QPP — ideally should be included in the analysis. Some of these features are quite complex, and charting their course over the whole postwar period would be an onerous task. Dahlby, however, draws on the work of Howard, Ruggeri, and Van Wart to estimate the overall, income-weighted AMTRs for 1986 and 1993,[10] finding that they rose 3.0 to 6.8 percentage points across provinces over that interval.

The indication is that non-PIT MTRs rose more quickly in the late 1980s and early 1990s than the PIT AMTRs discussed above. Consequently, in this section, I provide estimates of the overall AMTR for 1994, adding a full range of non-PIT taxes falling on personal income or expenditures.

Table 1 lists the various additions made to the AMTRs of the previous section, showing in each case the relevant tax base and income range, the tax rate (or rates), and the estimated number of adults affected. This information is sufficient to estimate the contribution each source makes to the overall AMTR with taxpayers equally weighted.

Before I discuss the individual non-PIT MTRs, note the bottom line of Table 1: adding all these MTRs increases the overall, equally weighted AMTR for Canada in 1994 by almost twenty-three percentage points. Adding this to the federal plus provincial PIT AMTR weighted by returns gives an overall figure of approximately 44 percent.

Income-weighted, the non-PIT MTRs contribute about fourteen percentage points to the overall AMTR, taking it to almost 51 percent. The non-PIT AMTRs total less when weighted according to income, rather than equally, because the items added at this stage are mostly absent at high-income levels or are relatively more important lower in the income distribution. The most important categories are sales and excise taxes, the social assistance taxback, and the GIS clawback, all of which affect

lower-income groups more strongly than higher-income groups.

The estimate of the income-weighted non-PIT AMTR is less precise than that of the equally weighted measure because it is more difficult to estimate the total income of the affected groups than their numbers. The ballpark is the right one, however, and following the same approach as earlier, one can calculate that a flat 51 percent MTR on labor income generates a marginal deadweight loss per dollar of tax on labor income equal to $0.45, in contrast to $0.21 for the 1994 PIT system alone.

### *Sales and Excise Taxes*

Although sales and excise taxes fall on the uses side, rather than the sources side, of the income ledger, having these broadly based taxes permanently in place creates deadweight losses similar to those caused by taxing income.

Some readers may object that taxpayers can escape these taxes by saving rather than consuming. Such escape is, however, merely temporary. Eventually, what is saved is consumed, and if the sales and excise tax regime is reasonably stable, then saving has little consequence for the discounted present value of consumption taxes paid. (A better escape, which I ignore here, is to consume outside the country.)

In 1994, Canadians paid sales and excise taxes that equaled 13.8 percent of their consumption expenditures on goods and services. The corresponding effective tax rate on income was lower, however, since people do not pay sales and excise taxes on the portion of their income yielded up to PIT and other direct taxes.

Treating all disposable income as consumed immediately or destined to be consumed in the future under an unchanged consumption tax regime and treating Canada's sales and excise tax system as if it were a uniform proportional consumption tax, one can calculate that the 13.8 percent tax rate on expenditure is equivalent to a 9.3 percentage point addition to the MTRs on pre-tax income.[11]

### *Social Assistance Taxback*

The taxback of social assistance (welfare) benefits is an important item because the number of individuals involved (about 2 million) is sizable, and because the clawback rates are very high.

Traditionally, welfare systems allowed recipients a small amount of tax-free earnings — perhaps $50 or $100 per month — and then taxed any excess at a 100 percent rate. In recent years, some provinces have introduced greater work incentives.

Unfortunately, the provincial systems are now so heterogeneous that an accurate estimate of the average clawback rate is difficult to obtain. Typically, the exempt amount of earnings is about the first $50 to $100 per month for single adults and $100 to $200 for married couples. Above that level, the variation is great. Some provinces allow qualifying welfare recipients to keep 25 percent of all earnings (the practice in 1994 in Ontario, Alberta, and Saskatchewan). Others still levy a 100 percent taxback as under the traditional system.[12] Indeed, the true taxback rate can exceed 100 percent because when families go off welfare completely, they lose nonmedicare health benefits and items such as subsidized rent and daycare.

About 15 to 20 percent of social assistance recipients have jobs, and many of these face the full brunt of social assistance taxback rates.[13] The situation of recipients who are jobless or earn very small amounts is less clearcut, but it is important in assessing the average MTR from social assistance taxback. One might suppose that any welfare recipient who is not working faces a zero marginal clawback. But such an assumption would greatly underrate the disincentive effects of the clawback. Although recipients can deduct small amounts from earnings to cover special clothing needed

**Table 1:** ***Non-PIT Marginal Tax Rates, Canada, 1994***

| Tax or Clawback | Base | Range | Marginal Tax Rate | Adults Affected | Contribution to Average Marginal Tax Rate (AMTR)[a] |
|---|---|---|---|---|---|
| | | *(dollars)* | *(percent)* | *(number)* | *(percentage points)* |
| Sales and excise taxes[b] | taxed goods and services | no limit | 9.26 | 22,122,800 | 9.26 |
| Social assistance[c] | income excluding social assistance | varies by family type, province, etc. | 75.00 | 1,954,600 | 6.63 |
| Unemployment insurance(UI)[d] | | | | | |
| Employee contributions | insurable earnings | 0–40,560 | 1.19 | 9,448,600 | 0.51 |
| Employer contributions | insurable earnings | 0–40,560 | 2.15 | 9,448,600 | 0.92 |
| Clawback | net income | 60,840 + | 30.00 | 39,700 | 0.05 |
| Canada Pension Plan / Quebec Pension Plan (CPP / QPP)[d] | | | | | |
| Employee contributions | pensionable earnings | 3,400–34,400 | 0.99 | 8,599,800 | 0.38 |
| Employer contributions | pensionable earnings | 3,400–34,400 | 1.30 | 8,599,800 | 0.51 |
| Goods and services tax (GST)[e] | | | | | |
| Credit | net family income | 25,921–32,001 (single); 38,081 (family of 4) | 5.00 | 2,263,400 | 0.51 |
| Credit supplement | net family income | 6,456–11,706 (single only) | – 2.00 | 1,600,000 | – 0.14 |
| Child tax benefit (CTB)[f] | | | | | |
| One child | net family income | 25,921–66,721 if child is older than age 7 | 2.50 | 1,184,800 | 0.13 |
| Two or more children | net family income | 25,921–66,721 if children are older than age 7 | 5.00 | 1,768,900 | 0.40 |
| Working poor supplement | net family income | 3,750–10,000 | – 8.00 | 271,100 | – 0.10 |
| Clawback of supplement | net family income | 20,921–25,921 | 10.00 | 418,700 | 0.19 |
| Age amount[g] | net individual income | 25,921–49,134 | 2.16 | 451,300 | 0.04 |
| Guaranteed income supplement (GIS)[h] | family income excluding old age security (OAS) | up to 15,717 (single) or 23,754 (married) | 50.00 | 1,355,300 | 3.06 |
| Spouse's allowance[i] | family income excluding OAS | up to 26,784 | 50.00 | 112,000 | 0.25 |
| Old age security[j] | net individual income | 53,215–84,234 | 15.00 | 213,100 | 0.14 |
| Total | | | | | 22.74 |

***Notes***

[a] AMTR equally weighted by the number of tax returns.

[b] In 1994, the total commodity tax revenue of all levels of government in Canada — including all federal indirect taxes; provincial and local retail sales and amusement taxes; and provincial gasoline taxes, other licence fees and permits, and liquor commission profits — was $62,247 million. Total personal consumption expenditures were $452.4 billion. The implied average tax rate is 13.8 percent. The "number of adults affected" listed in this row is the estimated population of Canada aged 18 and over as of July 1, 1994.

[c] Clawback rates on social assistance ranged from 0 to 100 percent. I assumed an AMTR of 75 percent, as explained in the text. The National Council of Welfare reported 3,100,200 social assistance recipients in Canada as of March 31, 1994. Sixty-three percent of recipients were adults in 1993; I assumed the same ratio for 1994.

[d] The estimated number of affected UI contributors is the number of taxfilers who claimed a nonrefundable credit for UI premiums in the 1994 tax year less those who had total income greater than $45,000 (most of whom had made the maximum contribution and therefore faced zero marginal contributions). Similarly, the estimated number of affected contributors to the CPP / QPP is the number of taxfilers claiming a credit for such premiums but whose total income did not exceed $40,000. Employees' contributions were creditable under the personal income tax (PIT), reducing the effective MTRs.

The 1994 statutory contribution rates for UI were 3.07 and 4.30 percent for employees and employers, respectively, and for the CPP / QPP 2.60 percent for both employees and employers. The MTRs shown here allow for half of these rates to be offset by the benefits of the plans.

[e] Revenue Canada reports the number of recipients and the amounts received, by number of children, marital status, age, and net family income. All those who have net income in excess of $25,921 but still received some GST credit face a 5 percent clawback. Only single individuals qualify for the supplement, which is phased in over the net income range of $6,456–$11,706.

[f] For parents with one child, the CTB is clawed back at a 2.5 percent rate on net family income over $25,921, and for those with two or more children the clawback rate is 5.0 percent above the same income threshold. Because these clawback ranges extend beyond those of the GST clawback, Revenue Canada information on GST recipients was not sufficient for estimation of the number affected. I turned to the Department of Human Resources Development, which reports that the monthly average number of families receiving the CTB in fiscal year 1993 / 94 stood at 3,040,078. I translated this number into an estimate of the number of adults living in families with one child or two or more children assuming the same demographic composition as Revenue Canada reports for families with net income of $25,000 to $30,000.

For the working poor supplement, the number of adults with net family income in the phase-in and phase-out ranges ($3,750–$10,000 and $20,921–$25,921, respectively), either as single individuals or as members of a married couple, could be estimated from Revenue Canada data by the same method I used for the GST credit (detailed above). But only those individuals and couples with children receive the benefit.

[g] In 1994, the full age amount was $3,482, and taxpayers age 65 and over received a nonrefundable credit against federal PIT worth 17 percent of this amount. Half the value of this credit was clawed back on a taxfiler's net income between $25,921 and $49,134. Revenue Canada records the net age amounts claimed by taxpayers in different total assessed income groups. In the $20,000–$25,000 group, for example, 286,450 taxfilers claimed an average of $3,480 in age amount. The average amounts claimed declined until hitting $1,786 in the $50,000–$60,000 group, after which almost all taxfilers experienced full clawback. I assumed that the fraction of taxfilers having their age amount clawed back within each of the income ranges $25,000–$30,000, $30,000–$35,000, $35,000–$40,000, $40,000–$45,000, $45,000–$50,000, and $50,000–$60,000 equalled the decline in average age amount claimed in moving from one income group to the next as a fraction of the decline that would have occurred if all individuals in the group experience the clawback ($375 per each $5,000 increase in income).

[h] All GIS recipients were subject to a 50 percent taxback of GIS benefits on income other than GIS, OAS, and a few other small categories.

[i] I accepted the Department of Human Resources Development report of the number of recipients as of March 1994.

[j] I assumed that all PIT filers aged 65 and over who made social benefits repayments in the 1994 tax year were repaying OAS rather than UI benefits.

***Sources:***

Sales and excise taxes: CANSIM, D11263–D11289, D11972.

Social assistance: National Council of Welfare, *Who Are the People on Welfare?*, Social Security Backgrounder 2 (Ottawa, 1994); idem, *Welfare Incomes 1994* (Ottawa, 1995).

UI and CPP / QPP contributions: Revenue Canada, *Tax Statistics on Individuals, 1996 Edition* (Ottawa, 1996), table 2.

GST credit: Canadian Tax Foundation, *The National Finances 1994* (Toronto, 1994), pp. 7:9–7:10; Revenue Canada, *Tax Statistics on Individuals*, part 4, pp. 258–264.

CTB: Canada, Department of Human Resources Development, *Report on the Old Age Security, Child Tax Benefit, Children's Special Allowances and Canada Pension Plan* (Ottawa, 1995), p. 8; Revenue Canada, *Tax Statistics on Individuals*, part 4, pp. 258–264.

Age amount: Revenue Canada, *Tax Statistics on Individuals*, table 2. GIS: Canadian Tax Foundation, *The National Finances 1994*, table 10.2, p. 10:3.

Spouse's allowance: Canada, Department of Human Resources Development, *Overview, Income Security Programs* (Ottawa, 1994), pp. 14–15.

OAS: Revenue Canada, *Tax Statistics on Individuals*, table 4.

on the job and other employment-related expenses, in many cases the true additional costs of going to work likely exceed the sum of these allowances plus exempt earnings.

In addition, the MTR in the narrow sense of the tax rate on the first dollar or two of earnings may not capture relevant tax disincentives very well. For example, a social assistance recipient may be offered a job that pays $300 per week, but may be able to avoid taxback on only the first $150 of earnings. She then faces a substantial work disincentive, and it is misleading, even if technically correct, to say that she has a zero MTR from the social assistance clawback.

For the purposes of the calculations reported here, I assumed an average taxback rate of 75 percent, intermediate between the lower effective rates for those with small earnings and the 100 percent rates that some recipients still face. On this assumption, the social assistance taxback adds 6.6 percentage points to the overall, equally weighted AMTR in Canada in 1994.

## *Social Insurance "Contributions"*

The required contributions to UI (or EI, as it has now become) and the CPP / QPP are not pure taxes. Between lower and upper contribution thresholds, as an individual's income rises and he pays larger contributions, he may also accrue the right to larger benefits. If these benefits were provided on an actuarially fair basis, then some analysts would suggest that the contributions be ignored here on the grounds that the expected present value of the additional benefits perfectly offset the cost of contributions.

This argument fails on two counts. First, many contributors have time-preference rates exceeding standard interest rates, and they may discount future benefits more because of uncertainty. These factors make marginal benefits fall short of the cost of contributions.

In addition, the plans are quite unlike true insurance or saving / annuity schemes. Although the unemployment rate was still high (10.4 per-cent) in 1994, the regular UI benefits paid out were only 62.1 percent of total (employee plus employer) contributions. And the link between CPP / QPP contributions and benefits is not as tight as it would be in a private retirement saving plan. For example, many of a contributor's lower earning years are neglected in the calculation of pension benefits; thus, as income rises for workers in those years, the marginal benefit is zero.

Here I assumed, for simplicity and for the sake of illustration, that the marginal benefit averaged half the marginal cost of increased contributions for both UI and the CPP / QPP. This rough-and-ready approach does reasonable justice to both these social insurance schemes as they existed in 1994. (For more recent years, one would have to assume a lower ratio of benefits to costs.)

Note also that I included both employee and employer contributions since, in a wide range of labor market models, employee and employer contributions have similar economic effects. (It is generally believed that labor effectively bears the burden of both the employee and employer portions of these payroll taxes in that the employer portions are shifted onto workers in the form of lower before-tax wages than they would otherwise receive.)

In 1994, UI contributions bulked larger than those for the CPP / QPP (a ranking that will be reversed in the future as the new, higher rates are phased in for the public pension plans). Both programs affected marginal tax rates for about 9 million workers, and together they added 2.32 percentage points to the overall, equally weighted AMTR.

This amount may appear small, in view of the considerable criticism of these contributions as killers of jobs. In part, the explanation is that the 1994 contribution rates were still fairly low. Also, much of the recent discussion

has focused on the planned future increases in CPP/QPP rates, rather than on rates at the level that prevailed in 1994.

Table 1 also records the effect of the clawback of UI benefits — in 1994, at a rate of 30 percent for taxpayers who had net income in excess of $60,840. This provides the first of several examples of the clawback of federal transfer payments. Although the clawback rate was high, it affected only about 39,700 taxpayers. Thus, although this MTR component is very important for some people, it added only 0.05 of a percentage point to the overall, equally weighted AMTR.

## *Federal Social Benefits and Clawbacks*

Various federal social transfers are phased in at a low-income level and taxed back at higher levels. The phase-in ranges cause negative contributions to individuals' MTRs, offsetting to a small extent the very high taxback rates under social assistance. The associated positive contributions to MTRs at higher income levels are the inescapable result of providing transfer payments that are targeted rather than universal. If a benefit is to be confined to lower-income families, then it must be taxed away at some point as income rises, which raises MTRs in the taxback range.

### The GST Credit

In 1994 the goods and services tax (GST) credit, which is fully refundable, provided $199 per adult and $105 per child, but the first child in a lone-parent family qualified for a higher credit of $199. For single adults, an additional credit of up to $105 was phased in at a rate of 2 percent of earnings in excess of $6,456, implying an upper limit of the phase-in range of $11,706).[14] This singles' supplement affected 1.6 million individuals and subtracted 0.14 of a percentage point from the overall, equally weighted AMTR.

When net family income rises above $25,921, the regular GST credit is taxed back at a rate of 5 percent. The range over which this MTR applies depends on how large the family's credits were before being clawed back. For a single adult, clawback is complete at an income of $32,001, but for a family with two adults and two children the 5 percent MTR continues to be effective up to $38,081.

In total, 2,263,400 adults were affected by the clawback in 1994, and it contributed 0.5 of a percentage point to the overall, equally weighted AMTR.

### The Child Tax Benefit

In 1993, the federal government replaced both the universal family allowance and PIT relief for families with children (aside from the child-care expense deduction) with the child tax benefit (CTB); the amount received depends on net family income.[15] Except in Alberta and Quebec, provinces that requested somewhat different benefit schedules, families received $1,020 for each of the first two children and $1,095 for the third and subsequent children in 1994. In addition, $213 per child under age seven was also provided in cases where no child-care expense was claimed.

As in the case of the GST credit, the CTB had a phase-in feature, with up to $500 being provided in 1994 as a supplement to the work-ing poor. This additional benefit was phased in at an 8 percent rate on income from $3,750 to $10,000. Only 271,100 individuals were affected in 1994, and the impact on the overall, equally weighted AMTR was a reduction of just 0.1 of a percentage point. Clawback of the supplement, on income from $20,921 to $25,921, increased the AMTR more — by 0.19 of a percentage point.

On net family income above $25,921, the CTB was clawed back at a rate of 2.5 percent

from families with one child and 5 percent from other families. With an estimated total of 2,953,700 adults affected, the impact on the overall, equally weighted AMTR, at 0.53 of a percentage point, was not insignificant.

### Seniors

Finally, a set of clawbacks affects older taxpayers and retirees. Under the PIT system in 1994, taxpayers age 65 and over received a nonrefundable "age amount" tax credit of $592. Half of it was taxed back at a 7.5 percent rate on income over $25,921. (For 1995 and later years, this clawback was fully phased in at a 15 percent rate.)

My estimate here is that 451,300 taxpayers were affected by the age amount clawback, leading to an addition to the overall, equally weighted AMTR of 0.044 of a percentage point in 1994. (The corresponding amount for later years would be 0.088 of a percentage point.)

An important source of income for many seniors in 1994 was the GIS, which had a 50 percent taxback rate on income (excluding OAS payments). With 1,355,300 people receiving GIS in 1994, a sizable group faced a substantial additional MTR, boosting the overall, equally weighted AMTR by 3.06 percentage points.

The closely related spouse's allowance, paid to qualifying spouses, widows, and widowers ages 60 to 64 of OAS recipients, was subject to an income test and had a complex taxback schedule. It affected only 112,000 individuals. My best guess of its contribution to the overall, equally weighted AMTR (0.25 of a percentage point) is based on the assumption of an average 50 percent MTR for the recipient.

OAS payments were clawed back at a rate of 15 percent on individual net income exceeding $53,215 in 1994. (Notice the contrast with the GST credit, CTB, and the GIS, which were all based on family income.) Only 213,100 taxpayers were affected by the controversial OAS clawback, which was a potent symbol of the retreat from universality when introduced. With relatively small numbers affected, the contribution to the overall, equally weighted AMTR, at 0.14 of a percentage point, was modest.

## Total MTR Schedules, 1994

That individuals in Canada, on average, face marginal tax rates as high as those reported above tells us that tax wedges are very sizable, and suggests that trying to reduce them might have a significant payoff in efficiency terms. However, merely knowing how high AMTRs had become in 1994 (or how much higher they undoubtedly are becoming today) does not provide any guidance as to which taxpayers in which income ranges face the steepest MTRs or where Canada ought to make MTR reduction an especially high priority. In order to get such insights, it is helpful to look at the schedule of total MTRs according to the income of various kinds of taxpayers.

Thus, in this section, I look at total MTR schedules for four types of households: a single, nonelderly adult; a lone parent with two children; a single-earner married couple with two children; and a retired taxpayer over age 65 living alone. I calculated the MTRs as a function of total income as assessed for tax purposes excluding exempt income (principally, social assistance benefits, the CTB, GST credits, and GIS payments).

In computing tax liability, I assumed that employed taxpayers all deducted a flat amount for contributions to registered pension plans (RPPs) and registered retirement saving plans (RRSPs), union dues, and other items aside from child-care expenses, and set this amount at $1,500, which was representative in 1994 for taxpayers with incomes of less than $40,000. (This amount is too small for higher-income taxpayers; however, the exact amount assumed at higher levels has little impact on the estimated MTR.)

In putting together the MTR schedules, I showed the impact of sales and excise taxes separately and assumed that these burdens can be treated as proportional to disposable income (see the discussion in the previous section). The allowance for sales and excise taxes at low-income levels is, however, accurate only for individuals who did not face a social assistance taxback. Those subject to one generally saw little increase (or sometimes even a decrease) in true disposable income as their earnings rose. Thus, their true marginal sales and excise tax rates were very small and could even be negative.

I also made some further simplifying assumptions: that nonelderly individuals' only source of income aside from transfers was labor income; that retired individuals received no labor income; that retirees' first source of income other than transfers was private pensions; and that all children in the hypothetical families were between the ages of 7 and 18. Variations on these assumptions could, of course, be introduced, but they would not diminish the relevance of the observations made below.

Before discussing my result, I should note a few points about what alternative patterns in the MTR schedules signify. An idealized negative income tax (NIT) system, under which families received a "demogrant" ( a grant calculated according to demographic characteristics and any special needs) and then faced a constant MTR would generate a flat MTR schedule. In other words, MTRs do not have to rise with income to produce a progressive tax system. An NIT can be quite strongly progressive, despite a constant MTR (see Table 2). It is even possible to have a progressive tax system with MTRs that generally decline with income, as long as the lowest income groups receive generous transfers before clawbacks begin.

In brief, the shape of the MTR schedule is not itself a guide to progressivity or its lack in the overall tax-transfer system. The shape of this profile does, however, reveal something about the income ranges and family types that face the most serious disincentive effects of taxation.

**Table 2:** ***Negative Income Tax Example***
(assuming a guaranteed annual income of $10,000 and a taxback rate of 50 percent)

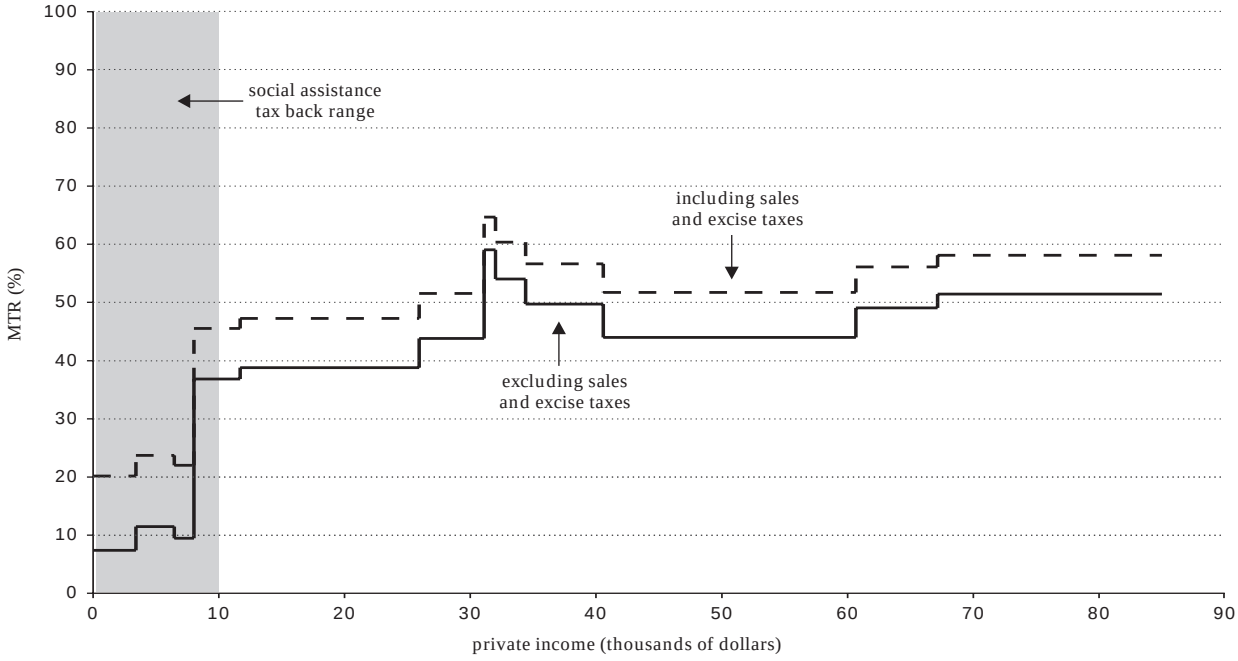
| Before-Tax Income | After-Tax Income | Average Tax Rate | Marginal Tax Rate |
|---|---|---|---|
| ($) | ($) | (%) | (%) |
| 1,000 | 10,500 | –950.0 | 50.0 |
| 5,000 | 12,500 | –150.0 | 50.0 |
| 10,000 | 15,000 | –50.0 | 50.0 |
| 20,000 | 20,000 | 0.0 | 50.0 |
| 30,000 | 25,000 | 16.7 | 50.0 |
| 50,000 | 35,000 | 30.0 | 50.0 |
| 100,000 | 60,000 | 40.0 | 50.0 |
| 200,000 | 110,000 | 45.0 | 50.0 |

## Single Adults

Figure 3 charts the pattern for single taxpayers at various incomes. Neglecting sales and excise taxes and the social assistance taxback, the total 1994 MTR for a single taxpayer was low up to an income of about $8,000 and then rose to peak at 59 percent for incomes in the range of about $31,000 to $32,000. The total MTR then declined to a more moderate level (44 to 51 percent) for income over $40,000.

The shaded area in Figure 3 adds information about the impact of the social assistance taxback. To bring social assistance into the picture, I show the limits of the region where the social assistance taxback applied (on the basis of average 1994 social assistance benefits across the provinces).[16] The effect of taking social assistance taxback into account is significant. Without it, one could argue that MTRs broadly speaking rise with income. But taking the taxback into account turns the region of otherwise lowest MTRs into that of the highest MTRs,

**Figure 3:** ***Total MTRs, Single Adults, Canada, 1994***




Source: Author's calculations.

from which there is a sharp decline to a region of comparatively flat MTRs for the population that does not receive social assistance. (A broadly similar pattern can be seen for all four family types depicted.)

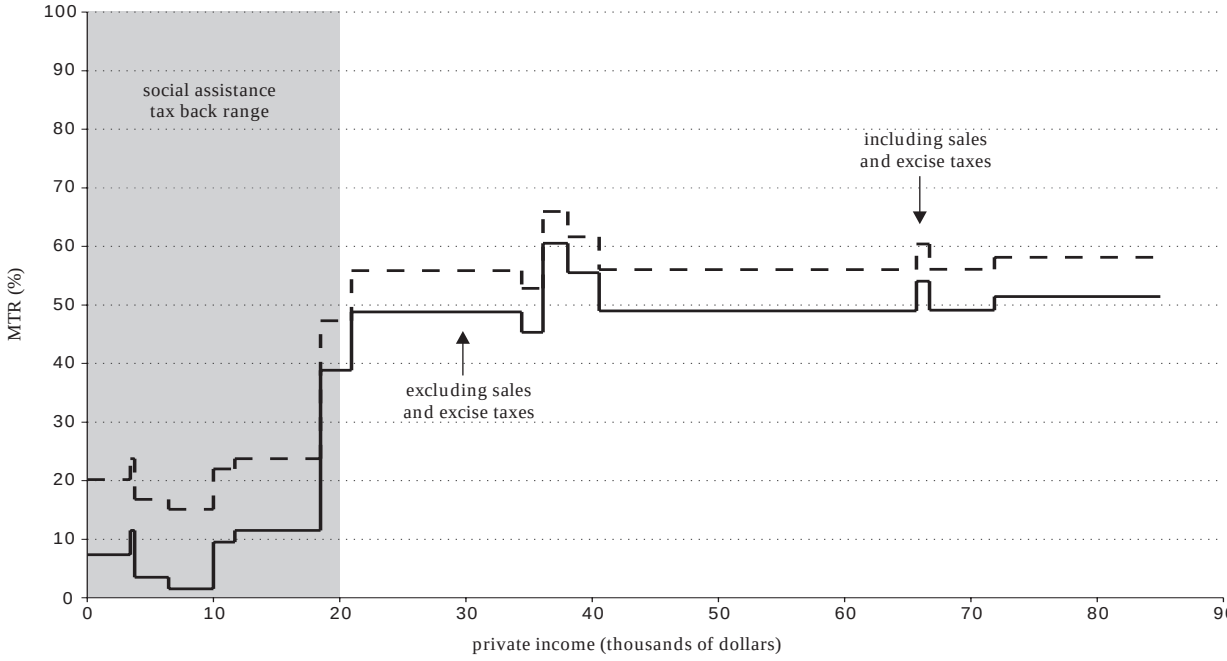
In Figure 3, the relatively low MTRs, aside from the social assistance taxback, up to the $8,000 income level come from UI and CPP / QPP contributions and sales and excise taxes. The sharp increase above that point occurs because the individual became liable for PIT, hit the 5 percent clawback of the GST credit at $25,921, and then entered the second PIT tax bracket (a federal basic MTR of 26 percent) at income of $31,090. The total MTR later declines as the GST clawback ended and income rose above maximum insurable earnings under CPP / QPP and UI ($34,400 and $40,560, respectively).

## A Lone-Parent Family

The situation of a lone parent with two children (shown in Figure 4) differs from that of a single individual because the CTB and the GST credit phase-ins and clawbacks are more important. In 1994, a low-income lone parent benefited in the $3,750 to $10,000 range from the encouragement offered by the $500 supplement to the CTB for the working poor (phased in at an 8 percent rate), as well as from the phase-in of the extra $105 GST credit between incomes of $6,456 and $11,706 (at a 2 percent rate).

At its minimum, the total MTR, neglecting sales and excise taxes and the effects of the social assistance system, was just 1.49 percent. The provision of additional benefits led to a higher MTR later on, however, as these benefits were clawed back. Thus, the total MTR peaked higher than in the case of a single individual, reaching 60.5 percent in the $36,000 to $38,000 range.

**Figure 4:** ***Total MTRs, Lone Parent with Two Children, Canada, 1994***




Source: Author's calculations.

## A Single-Earner Family

The 1994 MTR schedule for a single-earner family with two children (Figure 5) differed from that of a lone parent since the couple could not benefit from the child-care expense deduction. Also, the couple did not receive the 2 percent MTR reduction in the $6,456 to $11,706 range that the lone parent received in the form of the phase-in of the extra $105 GST credit for single adults.

These differences resulted in a wide overlap between the region in which the single-earner married couple paid PIT and the region of the social assistance taxback. From earned income of $13,441 to about $22,500, this couple may have paid a total MTR well in excess of 100 percent, due to the overlap of the bottom PIT bracket and the social assistance taxback range. The potential work disincentive effects are obvious and powerful.

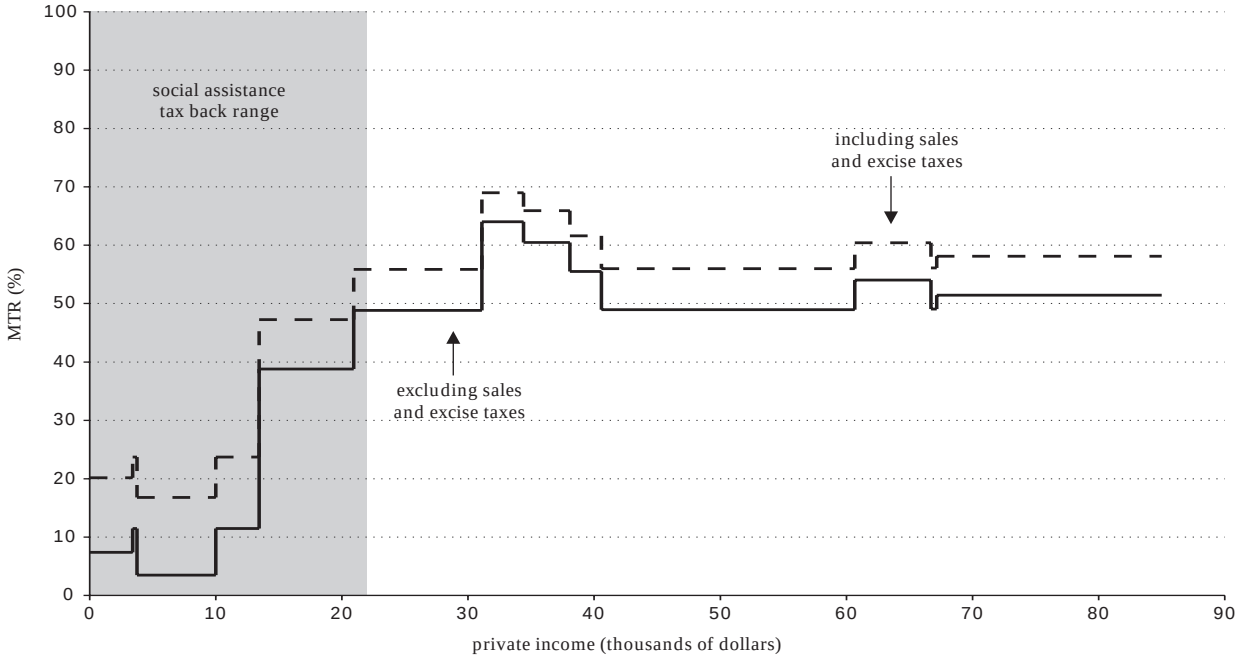
## The Single Retiree

The final case here is that of a single senior retiree (Figure 6). Now, UI and CPP / QPP contributions dropped out of the picture, but there was a 50 percent MTR on the first $11,064 of non-OAS / GIS income, producing high MTRs in the $4,653 to $15,717 range of assessed income. Subsequently, leaving aside sales and excise taxes, the MTR dropped to a 29 percent rate up to $25,921, followed by a hump peaking at 51 percent as the 5 percent GST clawback took place. Another drop, from income of $32,001 to $53,215, was followed by a third hump that peaked at 66 percent as the 15 percent OAS clawback took place. Finally, the MTR fell to 51 percent for seniors with income of more than $84,234.

Is it a serious problem that MTRs for seniors are so high over such a wide range? Given that these taxpayers are a small part of the labor force, the work disincentive effect is small.

Consequences for saving incentives are present, however. The federal government pro-

**Figure 5:** ***Total MTRs, Single-Earner Couple with Two Children, Canada, 1994***




Source: Author's calculations.

vides strong income support for low-income Canadians in old age via the OAS / GIS system. Further, the income generated by private retirement savings is taxed initially at a 50 percent rate via the GIS taxback feature. These features of the tax-transfer system make it financially unattractive for many low-income Canadians to save much for retirement.

Middle-income earners escape the influence of expected GIS taxback and are encouraged to save for retirement via RRSPs and RPPs, but they may face a saving disincentive from the OAS taxback. Taxpayers in the high-income groups potentially have much more in assets than could have been sheltered in RRSPs and RPPs. For them, the MTRs faced on unsheltered investment income can provide a significant saving disincentive.

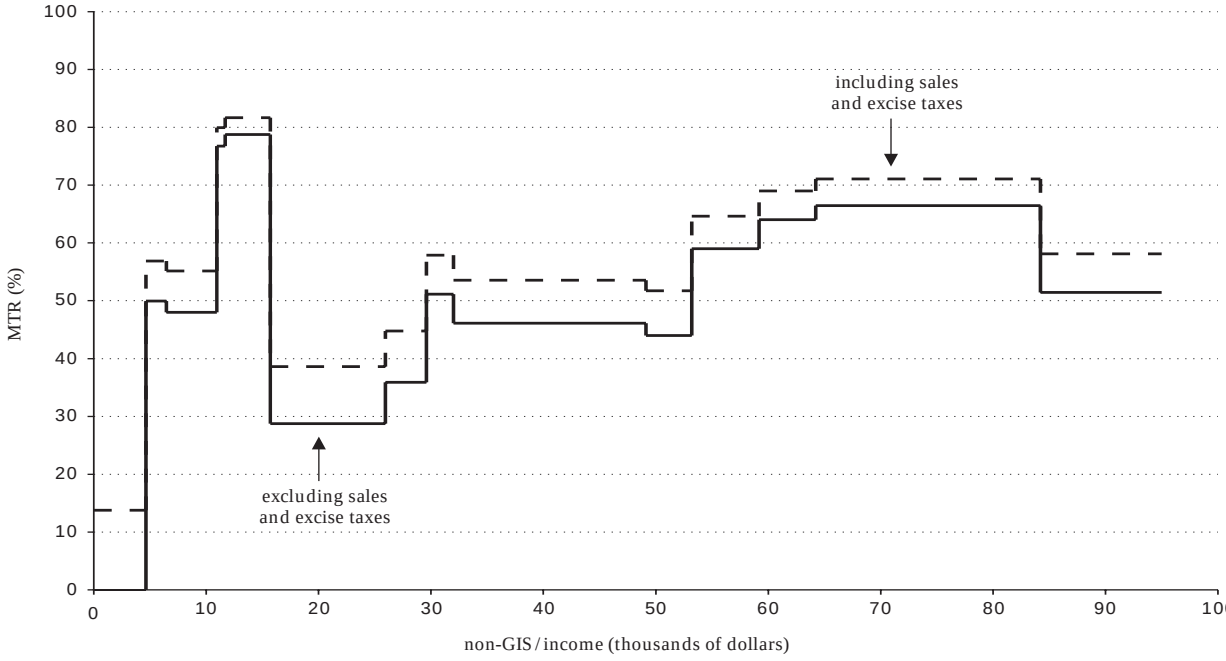
The most obvious ways to reduce the saving distortions caused by the 1994 MTR schedule for the elderly were to reduce (1) the amount of the GIS so that the taxback range was shorter; (2) the taxback rates on the GIS and OAS; or (3) the MTRs on investment income. The first option would have reduced old age income security greatly; the second would have been very expensive; and the third likely would have violated many Canadians' norms for vertical equity.

In fact, as we shall see in the next section, the recently announced seniors benefit, which will replace OAS / GIS in 2001, will *increase* MTRs for seniors by starting to claw back benefits at a lower income level and doing so at a higher rate than at present. Thus, the current trend is to exacerbate, rather than to reduce, the saving disincentive impact of seniors' tax treatment.

## Changes since 1994

Over the 1995 to 1997 tax years, changes in federal tax rates and structure were small. As mentioned earlier, strong economic growth and continuing mild inflation pushed more Canadians into higher PIT brackets, so that to-

**Figure 6:** ***Total MTRs, Single Elderly Retiree, Canada, 1994***




Source: Author's calculations.

tal AMTRs likely rose over the three years. While there were tax reductions in some provinces, notably in Ontario, during the period, I do not believe their impact is likely to have been large enough to reduce overall AMTRs.

The February 24, 1998, federal budget announced changes that will reduce MTRs for some low- and middle-income earners and increase them for others. The basic personal credit amount and the spousal or equivalent-to-spouse amount were both raised by $500. In addition, the 3 percent surtax was removed on taxable incomes up to $50,000. Child-care expense deductions were also raised. While these measures will reduce MTRs for the lowest earners, the benefits of the increased exemption and surtax removal are phased out as incomes rise, raising MTRs for other low- and middle-income earners. The impact on AMTRs of these changes and of other features of the budget (for example, student loan relief) is complex and warrants careful attention in future studies.

Future development will be very important. Changes have been announced in the CTB, in CPP / QPP contributions, and in benefits for the elderly that together will significantly alter MTR schedules for most family types.

## The CTB

Effective July 1997, the federal government announced a significant increase in the working income supplement under the CTB. Rather than a flat maximum of $500, parents can now receive up to $605 if they have one child, $1,010 with two, and an extra $330 for each additional child. The federal government estimates that 720,000 families will benefit from this system.[17] The February 1998 budget promised further enhancements to come in 1999 and 2000. Details will be announced later.

From July 1997 to July 1998, benefits are subject to a phase-in on income from $3,750 to $10,000. After July 1998, this feature will be ter-

minated, and families with zero income will receive full benefits. The impact on marginal tax rates will then come entirely via the clawback, which now occurs at higher rates than prior to July 1997. Starting at family income of $20,921, benefits are taxed back at a rate of 12.1 percent for families with one child, 20.2 percent if there are two children, and 26.8 percent for families with three or more children. At an income level of $25,921, the clawback reverts to its pre-reform level (see Table 1) — 2.5 percent for families with one child and 5 percent for those with two or more children. In addition to raising MTRs sharply for many low-income families, these changes have, of course, raised overall AMTRs.

## Income Security for the Elderly

More sweeping changes to the income security programs for the elderly were announced in the March 1996 federal budget, to take effect in 2001. At that time a new seniors benefit will replace the OAS/GIS system. The projection is that about 75 percent of seniors will receive higher benefits under this system than they do at present, but all those who were age 60 or over on December 31, 1995, will have the option of sticking with the current OAS/GIS rules.[18]

Clearly, some time will pass before the new system is fully phased in. The comments made below, it should therefore be emphasized, relate entirely to the new system.

Currently, OAS benefits are part of assessed income under the PIT and are clawed back at a 15 percent rate when an individual's income exceeds $53,215. Under the new system, benefits will not be part of taxable income, but the clawback will be at a 20 percent rate, the incomes of married persons will be aggregated, and the clawback threshold incomes will be lower. For an unattached senior, the clawback will begin at taxable income of $31,140 and be complete at $51,780. For a married couple, it will begin at $36,270 and end at $77,550. These rules are quite a contrast to those of the current system under which, for example, a low-income senior can continue to receive full OAS benefits irrespective of how high the spouse's income becomes.

How large are the implications for seniors' MTRs and for the overall AMTR? The federal government admits that 25 percent of seniors will be worse off under the new system than under the old. In 1994 terms, this corresponds to 835,211 individuals facing lower benefits as a result of the strengthened clawback.[19] In 1994, 213,000 seniors were subject to the 15 percent clawback. The increased number affected and the higher clawback rate mean that, if the new system had been fully phased in by 1994, the contribution to the overall, equally weighted AMTR from the clawback of seniors' pensions would have been about 0.75 of a percentage point, rather than the 0.14 of a percentage point shown in Table 1. As time goes on and seniors' incomes rise, more of them will crowd into the clawback region, pushing the contribution to the AMTR to more than 0.75 of a percentage point.

## The CPP/QPP

Finally, major (and controversial) changes were announced in early 1997 for the CPP/QPP system. As of 1997, employee and employer contributions had each grown to 3 percent of earnings between $3,500 and $35,800. Contribution rates are now slated to rise over the next six years to a total of 9.9 percent for employee and employer, and indexation of the $3,500 lower threshold is being eliminated.

Benefits are expected to be reduced on average by 10 percent, as a result of a combination of various measures. Thus, the entire rise in contributions may be viewed as a pure tax increase. Taking the relief of crediting of employee contributions for PIT purposes into account, the increase in combined employer-employee contribution rates will be

4.1 percentage points, which will produce a 1.6 percentage point increase in the overall, equally weighted AMTR.

### The Future

In summary, the 1997 and 1998 changes in the CTB and the announced future changes in the seniors benefit and the CPP / QPP when fully phased in will increase the overall AMTR for Canadians. The two latter changes alone will raise the overall, equally weighted measure by a total of about 2.2 percentage points.

Bracket creep, increased UI and CPP / QPP contribution rates, and the full phase-in of the age amount clawback have likely already raised the overall AMTR a few percentage points above its 1994 level of 44 percent. One can therefore project that when the planned future pension changes have been completed, the overall Canadian AMTR, weighting individuals equally, will be about 48 to 50 percent. The impact on the income-weighted measure will be roughly similar, so that the figure of about 51 percent arrived at earlier will rise to the neighborhood of 55 percent.

## Policy Directions

This *Commentary* has shown that average marginal tax rates in Canada are high — and increasing. Taking all forms of taxation into account, I calculated that the equally weighted AMTR faced by individuals in Canada in 1994 was about 44 percent, and it has probably risen a few percentage points since.

Weighted according to income — a more appropriate measure if the concern is inefficiency caused by taxation — the AMTR given by the federal and provincial PIT alone in 1994 was 36.5 percent. Adding non-PIT MTRs takes that income-weighted AMTR to almost 51 percent. An appreciation of the welfare consequences of such a high level of marginal tax can be gained by noting that, if all labor income were taxed at this marginal rate and typical assumptions about demand and supply labor elasticities held, the marginal deadweight loss would be $0.45 per dollar of additional tax revenue.

Moreover, these high AMTRs are going to increase significantly in the next several years as a result of increases in the CTB clawback, CPP / QPP contribution rates, and the introduction of the new seniors benefit, with its greatly strengthened clawback of benefits. By the time these changes have been made, the overall, equally weighted AMTR will have risen to about 48 or 50 percent and the income-weighted AMTR to about 55 percent, giving a marginal deadweight loss of $0.58 per dollar of tax revenue. With the AMTR at such a level, Canadians have good reason to be concerned about the welfare consequences of tax distortions.

Examination of the schedules for different family types reveals that the highest total MTRs

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are not borne by the highest-income households. In fact, the lowest-income households face the highest MTRs, principally because of social assistance taxback rates of 75 percent or more, but also because of UI (or EI) and CPP / QPP contributions and, in some cases, personal income tax. Above-average total MTRs also tend to be faced by those experiencing other forms of benefit clawbacks, such as those currently on EI benefits, OAS / GIS, GST credits, and the CTB. Reductions in such MTRs tend to be expensive in terms of increased net transfer expenditures, and the strong trend at present is toward increasing these MTRs at lower-middle-income levels as enhanced benefits for the poor are clawed back at higher rates. This is already taking place under the CTB and will grow with the new seniors benefit. Countering these trends are the increase in the working poor supplement under the CTB and the relief package for low- and middle-income earners in the February 1998 budget. Although these measures necessitate more severe clawbacks higher up the income scale, they provide the lowest earners some relief from high MTRs.

Unfortunately, given any desired minimum level of income support for the lowest earners in society, revenue requirements for other purposes, and governments' current fiscal responsibilities, reducing benefit clawbacks must come at the expense of increasing other tax rates. One result may even be a net increase in the overall AMTR. For taxpayers above the clawback range, benefit clawbacks are like a lump-sum tax; that is, they impose a zero marginal tax rate. In contrast, a rise in the GST or in all PIT rates would raise MTRs for all taxpayers. Thus, an attempt to reduce work disincentives for lower-income groups may come at the cost of a larger increase in such disincentives at higher-income levels.

Canada is fortunate in that some room for tax reductions will emerge in the next several years. The "fiscal dividend" from expected surpluses should make possible a reduction in the total AMTR without a decrease in the income supports going to the low-income population.

What would be the best way to effect this reduction? One obvious policy direction is to reduce the high CTB clawback rates. Another is to reduce social assistance taxback rates. Taxing away 75 percent of recipients' marginal earnings constitutes a strong work disincentive, especially when one takes into account the simultaneous loss of in-kind benefits, payment of EI and CPP / QPP contributions, and possibly payment of PIT. The goal of a 50 percent taxback rate is a good one to aim for, even though it is unlikely to be achievable in the short run.

The problem of high marginal tax rates at low- and middle-income levels has been exacerbated by the only partial indexation of PIT brackets and credits. As we have seen, the results were a 10.6 percent reduction in the real value of these brackets and credits between 1988 and 1994 and a substantial increase in the number of low-income people liable for PIT. This trend will continue until re-indexation is implemented (assuming that Canada never hits zero or negative rates of inflation).

Clearly, it is time to re-introduce full indexation of brackets and credits. Doing so today would, in itself, be costless — that is, there would be no impact on current revenues. All that would happen is that future revenues would not grow as rapidly as under the current system.

But it is possible and desirable to do more. Lack of indexation has led to a situation in which a substantial number of Canadians in poverty, even those still receiving social assistance benefits, pay personal income tax. What is needed is restoration of brackets and credits to the real value they had at the time of the 1987 tax reform, and full re-indexation. And when the fiscal situation has improved sufficiently to allow further tax cuts, that should be accomplished through reductions in the federal PIT rates, starting with the bottom rate, which now stands at 17 percent.

## Notes

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1 See, for example, Roger S. Smith, "The Personal Income Tax: Average and Marginal Rates in the Post-War Period," *Canadian Tax Journal* 43 (5, 1995): 1068–1074, especially table 8 and figure 3.

2 Bev Dahlby, "The Distortionary Effect of Rising Taxes," in William B.P. Robson and William M. Scarth, eds., *Deficit Reduction: What Pain, What Gain?* Policy Study 30 (Toronto: C.D. Howe Institute, 1994).

3 James B. Davies and Junsen Zhang, "Measuring Marginal Income Tax Rates for Individuals in Canada: Averages and Distributions over Time," *Canadian Journal of Economics* 29 (November 1996): 959–975.

4 Organisation for Economic Co-operation and Development, *OECD Economic Survey: Canada, 1996–1997* (Paris: OECD, 1997), p. 93.

5 In 1989, Canadians faced a surtax of 4 percent on basic federal tax up to $15,000 and 5.5 percent on basic federal tax over $15,000. In 1990, the dividing line remained $15,000, but the lower and upper rates changed to 5 and 8 percent, respectively. In 1991, the 5 percent rate was applied to the first $12,500 of basic federal tax, and a 10 percent rate to basic federal tax over $12,500.

6 In 1992, there continued to be two surtax rates: 4.5 percent applying to the first $12,500 of basic federal tax, and 9.5 percent on basic federal tax in excess of that amount. In both 1993 and 1994, the rates were 3 and 8 percent, respectively.

7 See, for example, David E. Wildasin, "On Public Good Provision with Distortionary Taxation," *Economic Inquiry* 22 (April 1984): 227–243.

The assumption that the demand for labor is perfectly elastic is often justified by the argument that Canada is a small, open economy. Also, elasticity does not have to be very high before the calculated MDWL comes reasonably close to that given by the simple formula in the text.

Note that if a government increases the MTR on labor income but holds the average tax rate constant (say, by making an offsetting change in nonrefundable personal credits), then the left-hand side of the equation gives the marginal cost of funds. (See, for example, Dahlby, "The Discretionary Effect of Rising Taxes," p. 49.) In general, however, average tax rates change when marginal rates change, a fact that must be taken into account carefully in estimating the marginal cost. Such an analysis is beyond the scope of this paper.

8 Dahlby, "The Discretionary Effect of Rising Taxes," p. 59.

9 For example, if MTR / ATR = 1, a 1 percent increase in income leads to a 1 percent increase in tax liability, as it would under a proportional tax. If MTR / ATR < 1, the average tax rate falls as income rises — that is, the tax system is regressive. If MTR / ATR > 1, the tax system is progressive — that is, the average tax rate rises as income increases.

Liability progression is a popular middle-of-the-road measure of progressivity, but analysts have designed others (some of which embody rather extreme viewpoints). For examples, see Richard A. Musgrave, Peggy B. Musgrave, and Richard M. Bird, *Public Finance in Theory and Practice*, 1st Canadian ed. (Toronto: McGraw-Hill Ryerson, 1987), pp. 338–340.

10 Dahlby, "The Discretionary Effect of Rising Taxes"; and R. Howard, G.C. Ruggeri, and D. Van Wart, "Federal Tax Changes and Marginal Tax Rates, 1986 and 1993," *Canadian Tax Journal* 43 (4, 1995): 906–922.

11 Treating the sales and excise tax system as if it were a broadly based, proportional consumption tax is a fairly good approximation for present purposes. It is true that many necessities are exempt from GST and provincial sales taxes; however, the sales and excise taxes on alcohol and tobacco, which are heavy, hit disproportionately at lower income levels. The result is

that total sales and excise tax burdens are close to proportional to total consumption expenditures.

*12* See National Council of Welfare, *Welfare Incomes 1994* (Ottawa, 1995), pp. 37–44.

*13* A sample of lone-parent social assistance recipients in New Brunswick and British Columbia, drawn in 1992 and 1993, revealed that 19.1 percent were employed. Those who had worked in the previous nine months had received an average wage of $6.80 per hour, and those currently working averaged 17.5 hours of work per week. See Tod Mijanovich and David Long, "Creating an Alternative to Welfare" (Ottawa: Social Research and Demonstration Corporation, 1995). These figures suggest average monthly earnings of about $475, sufficient for the typical recipient to be in the 75–100 percent taxback region.

Boessenkool provides further evidence on the frequency of employment of social assistance recipients. His data reveal that 20.4 percent of Alberta welfare clients had employment in March 1996. Kenneth J. Boessenkool, *Back to Work: Learning from the Alberta Welfare Experiment*, C.D. Howe Institute Commentary 90 (Toronto: C.D. Howe Institute, April 1997).

*14* The structure of the GST credit and its taxback features are summarized in Canadian Tax Foundation, *The National Finances 1994* (Toronto: CTF, 1994), pp. 7:9–7:10.

*15* The structure of the CTB is summarized in Canadian Tax Foundation, *The National Finances 1996* (Toronto: CTF, 1996), p. 7:9.

*16* In some provinces with a 75 percent taxback rate, such as Ontario, benefits were above the national average. In those cases, the upper limit of the region where taxback applied is more than shown in the diagram. On the other hand, where the taxback rate exceeded 75 percent and benefits were at or below the national average, the upper limit of the taxback range was less than shown in Figure 3. The shaded area in the diagram is thus a compromise.

*17* Canada, Department of Finance, *Working Together towards a National Child Benefit System* (Ottawa, February 18, 1997).

*18* Canada, *The Seniors Benefit: Securing the Future (*Ottawa, March 6, 1996).

*19* This number is a lower bound on the number of seniors who will pay the 20 percent clawback rate. The federal government makes clear that removing benefits from taxable income will enable a small number of seniors to receive larger net benefits under the new system, despite being subject to the 20 percent clawback. Ibid., charts 3 and 4.

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