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A Question of Fairness: Time to Reconsider Income-Averaging Provisions

Taxpayers can face an implicit tax penalty on irregular or fluctuating income. Reintroducing income-averaging provisions in the tax code would make the tax system fairer and encourage entrepreneurship.

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The Study In Brief

A system of progressive marginal income tax rates, as in Canada, tends to impose a greater tax burden on individuals whose incomes are irregular or fluctuate year-by-year, compared to individuals with steadier incomes of the same average value over several years. Take, for example, a person without dependents living in Ontario. Suppose she earns $50,000 in 2016 and $100,000 the following year. Thus, her average income is $75,000 per year. However, her total income tax for the two years is about $1,900 more than if she had earned, instead, $75,000 in both years. On an annual basis, her extra tax liability is almost $1,000, or 1.3 percent of her average annual income. A similar tax penalty on fluctuating income would occur in a case where her income had fallen from $100,000 in 2016 to $50,000 in 2017. Call it the "fluctuation penalty," for short.

The fluctuation penalty is a policy concern for reasons of fairness and the adverse incentives it may create for risk-taking activities, such as entrepreneurship. In terms of fairness, the fluctuation penalty violates the principle of horizontal equity, which is that equals should be taxed equally. Vertical equity is also weakened, if the fluctuation penalty is most acute for lower-income persons.

But how severe is the fluctuation penalty in Canada? The answer will depend, not only on the marginal tax rates and tax credits, but also on the actual patterns and sources of incomes received by individuals over several consecutive years. This study uses longitudinal data spanning the six-year period, 2005-2010. After restricting the data to focus on individuals who can be expected to pay taxes, the sample contains about 7,000 persons.

We compare the tax burdens that these individuals paid on their observed incomes with a counterfactual situation, in which the same individuals earned a constant income with the same six-year average value as their observed incomes, adjusted for inflation. The difference in tax burdens is expressed as a percentage of an individual's income and, hence, represents the increase in the average tax rate paid by an individual taxpayer.

The main findings are that the fluctuation penalty is relatively largest for lower-income taxpayers, the unincorporated self-employed, and recipients of capital gains. The fluctuation penalty in Canada appears especially harmful for the poor and for potential entrepreneurs.

Prior to 1989, provisions in the tax code allowed taxpayers to smooth their taxable incomes by using an average of more than one year's income as the basis for calculating the tax liability. Reintroducing one or more of these provisions would help address the fluctuation penalty today.

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New federal and provincial income tax brackets introduced in 2016 make this an opportune time to consider reintroducing income-averaging provisions into the tax code. These could make the personal income-tax system fairer and encourage entrepreneurship.

Currently, individuals whose incomes fluctuate between different tax brackets over several years may face a larger total income-tax burden than others who have steadier annual incomes with the same average value. Take, for example, a person living in Ontario. Suppose she earns $50,000 in 2016 and $100,000 the following year. At $50,000, the combined federal and provincial marginal tax rate is 29.65 percent, while at $100,000 the marginal tax rate is 43.41 percent. As a result, her total income tax for the two years is $1,904 *more* than if she were to earn, instead, $75,000 in both years. Therefore, even though she earns an average $75,000 per year, the tax bills are significantly unequal. On an annual basis, her extra tax liability in the case of fluctuating income is almost $1,000, which is 1.3 percent of her average annual income.

While most wage and salary workers have relatively smooth income flows, self-employed individuals or workers with spells of unemployment typically experience irregular incomes. Capital gains can provide another temporary shock to taxable income. While they may accrue over many years, the cumulative value is taxed entirely in the year the gains are realized. These situations expose some taxpayers to an implicit tax penalty on irregular or fluctuating income.[1] Call it the "fluctuation penalty" for short.

Several provisions in the tax code used to exist in Canada to redress the excess tax burden on irregular or fluctuating incomes. These provisions are known as income-averaging methods. Each provision permitted taxpayers to calculate their tax liability based on an average of several years' income, rather than on a single year's. In this way, incomes were smoothed over time for tax purposes, and the fluctuation penalty that arose from annual income taxation was diminished. However, all four income-averaging methods were eliminated in the 1980s.[2]

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1 Indeed, in the US the desire to moderate the impact of progressive tax rates on realized capital gains led to preferentially low tax rates on such gains (Pechman1977). Similarly, in Canada the 50-percent-inclusion rate for capital gains taxation reduces, but does not eliminate, the fluctuation penalty on capital gains.

2 The provisions known as General Income Averaging and Income-Averaging Annuity Contracts were eliminated in 1982, while Block Averaging and General Forward Averaging ended in 1988.

Box 1 summarizes three of these schemes.[3] They were removed from the tax code to simplify the calculation of tax liabilities and because the number of federal tax brackets was lowered from 10 to just three by 1987, making it less common for individuals to move across tax brackets. Previously, income-averaging methods were even more important, as there were 15 federal brackets in 1971.

Recently, however, both federal and provincial governments have added new tax brackets. There is a new federal marginal tax rate on incomes above $200,000; there are now five federal tax brackets with marginal tax rates ranging from 15 percent to 33 percent. Meanwhile, Alberta has moved from a single-rate system to five provincial marginal tax rates. Other provinces have also added new tax brackets and raised some marginal tax rates. As of 2017, there are, for example, 11 combined federal-provincial tax brackets in Ontario (including surtaxes) and nine federal-provincial brackets in Alberta. Hence, positive or negative shocks to personal income can easily move a taxpayer temporarily up or down the marginal tax-rate schedule.

The size of the fluctuation penalty depends not only on the marginal tax-rate structure but also on the degree of instability in personal incomes. The need for income averaging is supported by strong evidence that incomes have become less stable since the 1980s in Canada, as in the United States.[4] Moreover, with the growth of the so-called sharing economy, increasing numbers of individuals are expected to earn at least a portion of their incomes by providing services through peer-to-peer online markets such as Airbnb and Uber. This trend may generate greater volatility in personal incomes and thereby augment tax fluctuation penalties in the future.

Together, the recent increases in the number of tax brackets, the higher top-end marginal tax rates and the observation that incomes are more unstable than in the past all point to the possibility that the implicit tax penalty on fluctuating incomes is quantitatively important for a significant number of Canadian taxpayers, especially those who now face a combined federal-provincial top income tax rate of more than 50 percent in six provinces. If this, indeed, is the case, then the fluctuation penalty violates two basic principles of fair tax treatment: horizontal equity and vertical equity, terms that are defined below.

Meanwhile, a fluctuation penalty may also deter risk-taking economic behaviour such as entrepreneurship, which in turn can negatively impact the growth of small businesses. Yet, there is almost no research available that estimates the size of the problem or that evaluates how alternative income-averaging provisions might mitigate the problem.

This *Commentary* aims to fill that void. It provides estimates of the size of the fluctuation penalty in Canada, using a tax simulator and data

3 Box 1 does not include discussion of Income-Averaging Annuity Contracts, which can be described very simply. A taxpayer claims a tax deduction for the purchase price of an IAAC and pays tax later as future payments from the annuity are received.

4 Estimates by Moffitt and Gottschalk (2012) showed a marked increase in the transitory component of the total variance of male earnings in the US during the 1970s and 1980s and its continued high level to 2004. Meanwhile, Hacker (2004) found that the year-to-year variation in family incomes more than doubled between 1974 and 1998. These results are corroborated by other studies using various empirical approaches. For Canada, Baker and Solon (2003) found increases in the transitory variance of earnings over the 1976-1992 period, while Ostrovsky (2010) found that the increases in the transitory variance contributed to rising inequality in the 1990s and into the 2000s. For their part, Beach et al. (2010) found a decline in the transitory variance for men and women in the late 1980s, but a resurgence in the late 1990s.

Box 1: Summary of Different Income-Averaging Provisions

Canada has experience with several income-averaging provisions. The key features of the three main types are summarized here.[a] Taxpayers are never obliged to use an averaging formula; they elect to do so voluntarily, when they expect it to produce a tax saving.

Block Averaging

Block averaging gives taxpayers the option to recalculate their tax liabilities in the current year and the four immediately preceding consecutive years by prorating the aggregate income equally over the period.[b] The difference between the actual taxes paid and the recalculated amount is refunded. None of the current and preceding four years used to define the block can be reused in any subsequent block. Once the option to average has been exercised, the tax liabilities for the next four years are determined from the unaveraged annual incomes. Therefore, taxpayers must exercise foresight in judging when it is beneficial to declare a block of years. An attractive feature of block averaging is that the taxpayer can be relieved for both unusual income increases and unusual income reductions. Block averaging existed in Canada from 1950 to 1982 for farmers, fishers and writers with copyright sales. The 1967 Royal Commission on Taxation, recognizing that the penalty can arise for anyone having fluctuating incomes, recommended extending block averaging to all Canadian taxpayers.

General Income Averaging

Applying the general income-averaging formula for calculating the tax liability in a given year is quite complex, but the key features are as follows. A threshold income is defined by 110 percent above the previous year's income (or 120 percent above the average of the preceding four years' income, if this is greater). General income averaging provides a tax concession only on the portion of the current year's income that is above the threshold. The average marginal tax rate that is normally applicable to the first one-fifth of the income between the current income and the threshold is applied to the whole of the difference between these amounts. In this way, large income gains are taxed at a reduced marginal tax rate. The threshold avoids dealing with minor year-over-year income increases. However, the threshold also precludes tax relief for temporary falls in income, although the parameters of the averaging formula can be configured to extend tax benefits to negative income shocks. The general income-averaging provision existed in Canada between 1972 and 1982 and applied to all types and sources of income.

a See Salyzyn (1984) for the history of income-averaging provisions in Canada and for a thorough discussion of these and other provisions.

b The prorating is done on "gross income," defined as taxable income plus basic personal amounts. In this way, the tax calculation based on the averaged income applies the annual basic personal amounts as deductions or credits in the usual manner.

Box 1: Continued

General Forward Averaging

Unlike block averaging and general income averaging, which are backward looking, general forward averaging is a forward-looking approach. The taxpayer invokes the provision to defer taxes by shifting current income to future years, in anticipation of earning less income and facing lower marginal tax rates. The forward income-averaging mechanism gives an individual the option to exclude a certain amount of income from taxation in the current year. A withholding tax is applied to the excluded amount. The exclusion is added to the taxpayer's stock of "accumulated averaging amount." This stock is drawn down in the future years by adding amounts of it to the taxpayer's income in those years. At such times, the prepaid taxes are credited against the taxes currently owed.

Both the prepaid tax and the accumulated averaging amount are indexed for inflation. A formula, based in part on income and inflation over the previous three years, determines how much income is eligible to be excluded from taxation in a given year (though the eligibility restriction is not applied to income from certain sources such as artistic productions, athletics, public entertainment and a portion of capital gains). The forward income-averaging mechanism was applied in Canada from 1982 to 1988. An important criticism of the provision was that the withholding tax rate was the top marginal rate, making the provision unattractive for taxpayers in lower tax brackets, given discounting for the time value of money. However, the withholding tax rate is a policy choice. Some time limit should be placed on the tax deferments, as otherwise the provision becomes simply a retirement savings instrument.

that track the individual incomes of Canadians for six consecutive years from 2005 to 2010.[5] Six consecutive years is a span of time that seems adequate for distinguishing between short-term fluctuations versus long-term income levels.[6] The fluctuation penalty estimates are analyzed to identify the characteristics of individuals with high penalties and to assess horizontal and vertical equity. The authors then evaluate the performance of alternative income-averaging provisions in reducing the fluctuation penalty.[7]

5 The average value of the fluctuation penalty over the 2005-2010 period is only slightly larger than for the 2002-2007 period, suggesting that our results are not likely to be special to the period spanning the 2009 recession.

6 Some commentators have advocated for lifetime income averaging. Aside from its practical implementation, it arguably also provides an inaccurate basis for measuring ability to pay, since it does not correspond to the economic planning horizon of individuals.

7 A number of academic articles have examined the size of the fluctuation penalty using hypothetical numerical examples of uneven income streams, rather than actual data. The results reported in this *Commentary* are from Gordon and Wen (2017), which provides fuller descriptions of the methods and data used to estimate the fluctuation penalties as well as additional findings.

The main findings of our study are as follows.

- The fluctuation penalty is most severe for individuals who are lower-income or self-employed.
- Those most affected obtain much higher proportions of their incomes from self-employment or capital gains, compared to the rest of the population.
- The general-averaging formula and forward-averaging mechanism would generate modest tax savings, on average, for individuals affected by the fluctuation penalty, but there are opportunities to improve the design of these income-averaging methods.

The next section describes the principles of horizontal equity and vertical equity and reviews the evidence on the adverse effects of the tax penalty on the incentive for entrepreneurship. These concepts and observations provide a framework for thinking about the issues raised by the fluctuation-penalty estimates.

Principles of Equity in Taxation

A central idea of equitable or fair taxation is that tax burdens should be commensurate with ability to pay. In practice, ability to pay is measured by an individual's income. This leads to two dimensions of tax fairness: horizontal equity and vertical equity.

Horizontal Equity

The principle of horizontal equity states that individuals with the same ability to pay should pay the same amount in taxes. In other words, persons who are equally well off in the absence of taxes should be equally well off after. The upshot of this criterion is that tax burdens should depend on total personal income, rather than on the sources of personal income. In other words, incomes (both cash and in-kind) from all economic activities should be taxed at the same rate. If, for example, someone chooses to be an artist selling his paintings for a living, why should he pay more taxes than his cousin, who earns a comparable salary from employment? Yet, commercial artists tend to have irregular income flows due to the nature of their business, making them susceptible to the fluctuation penalty.

The horizontal equity principle drives important features of the Canadian tax system. For instance, the integration of personal and corporate income taxes through the dividend tax credit aims to make the playing field equal between unincorporated and incorporated business income. Similarly, the professional or business income of self-employed individuals is taxed at the same rate as wage and salary earnings.

In general, the principle of horizontal equity serves as a caution against arbitrary discrimination in the tax system. It can be thought of as a rule of thumb in support of social welfare maximization, which should be violated only in compelling circumstances.[8] Since the fluctuation penalty is presumably an unintended and, hence, arbitrary consequence of progressive marginal tax rates, it violates horizontal equity. It is an empirical question as to whether this departure from principle is quantitatively important or negligible.

Vertical Equity

The vertical equity principle states that individuals with a greater ability to pay should bear relatively higher tax burdens. It is often interpreted in a stronger form: the proportion of income paid in taxes – i.e., an individual's average tax rate – should rise with the person's income. The principle is

8 The horizontal equity principle is not directly rooted in welfare economics, which is the normative framework used by economists to recommend policy choices. However, the principle can serve as a guide to welfare maximization in the absence of clear reasons for deviating from the principle (Kaplow 2010).

grounded in the theory of welfare economics. The basic idea is that an extra dollar of taxes is more detrimental to someone who makes $100 than it is to someone who makes $1,000.[9] It is for the purpose of achieving vertical equity that the federal and provincial personal income tax systems have progressive marginal tax rates.

There are several ways that the fluctuation penalty could potentially adversely impact the objective of vertical equity. The most obvious way is if lower-income individuals have less stable incomes than higher-income persons. In general, less educated, lower-income individuals do, indeed, have less stable income streams than more educated, higher-income individuals. Garcia-Medina and Wen (2017) find that families where the head of the household has less than high-school education have more than twice the variation in family incomes over six-year periods than those with university education. Consequently, lower-income individuals are more likely to move across different tax brackets, potentially exposing them to relatively large fluctuation penalties.

Furthermore, low-income individuals with dependents may be unable to exhaust the basic personal tax credit and spousal credit in a given year.[10] As these credits are non-refundable, the low-income taxpayer simply forfeits these amounts even if the person's income rises in the next year and triggers a net amount of tax owing.

Another consideration is that many unincorporated, self-employed individuals have relatively low incomes. It is well documented that the self-employed tend to have more volatile incomes than wage/salary workers. This is another channel through which the fluctuation penalty may compromise the principle of vertical equity. Again, it is an empirical question as to whether the situations described above occur frequently enough to warrant policy changes.

Evidence of Adverse Incentive Effects

Ideally, tax systems are neutral in the sense that they do not create incentives to avoid or to engage in particular economic activities. Violations of neutrality can lead to suboptimal allocations of resources. One concern about the fluctuation penalty is that it may discourage economic risk-taking. More specifically, entrepreneurship is important for generating employment and innovation, but the returns from entrepreneurship are inherently risky.[11] Under progressive taxation, successful entrepreneurs pay substantial taxes, but when they incur losses, their tax benefits are relatively small. Consequently, entrepreneurs are susceptible to the fluctuation penalty, which may discourage entrepreneurship.

Indeed, there is evidence that self-employment, as one measure of entrepreneurship, is reduced by

9 More generally, government tax policy may reflect a society's aversion to income inequality.

10 The basic personal tax credit is calculated by multiplying the tax rate for the lowest tax bracket by the basic personal amount. The 2017 tax credit is 15 percent × $11,635 = $1,745 ($1,721 in 2016). The tax credit for supporting a spouse is the same. Hence, an individual earning less than 2 × $11,635 = $23,270 and who has a dependent spouse would not be able to use up the basic personal amount and the spousal amount, even if the individual's income rose above this threshold in the following year. Tax credits for dependent children can have similar implications for low-income taxpayers with uneven income flows.

11 In Canada, half (49 percent) of small- and medium-sized businesses fail within the first five years (Industry Canada, 2012) and the cross-sectional dispersion of self-employment earnings is substantially higher than wages from paid employment (LaRochelle-Côté and Uppal 2011).

these tax factors.[12] Whether government should encourage entrepreneurial activity is a matter of debate.[13] However, the objective of fostering small-business growth is consistent with the design of other government policies, such as the small business tax credit and the Scientific Research and Experimental Development Tax Credit. The common view, therefore, is that the fluctuation penalty may be inducing inefficient economic choices. Furthermore, taxpayers may waste resources by spending time and effort to change the natural timing of their income receipts. Examples of such tax planning include the accumulation of retained earnings in a business rather than paying dividends, postponing the realization of capital gains and receiving compensation for work through non-taxable, in-kind benefits in lieu of taxable income.

Estimates of the Fluctuation Penalty in Canada

Data and Method

The estimates of the fluctuation penalty are based on the 2005-2010 Survey of Labour and Income Dynamics (SLID). The SLID provides an individual's (and family's) income for six consecutive years, disaggregated by source such as wages and salaries, unincorporated business income, taxable capital gains, investment income and government transfers. We excluded from our calculations individuals reporting being out of the labour force or who have an average income less than $8,000 over the survey's six-year period.[14] The final sample size consists of about 7,000 individuals, who are in the data for six (sometimes only five) years.

The fluctuation penalty is the difference between an individual's total personal income tax liability over six consecutive years and the total personal income tax that would have been paid, if he or she had received an equivalent six-year total real income as a constant annual stream. The tax calculations are made using the Canadian Tax and Credit Simulator (CTaCS) (Milligan 2012).[15] The Working Income Tax Benefit is included in the calculation of the fluctuation penalty, but the Canada Child Tax Benefit and the GST-HST tax credit are not.[16]

The calculation of the tax liability in the counterfactual case of a constant real income is complicated by the fact that the personal income

12 Gentry and Hubbard (2000) find that progressive taxation in the US reduces entry into self-employment. Using annual aggregate data, Ferede (2013) finds that provincial self-employment rates are negatively related to a measure of progressive marginal tax rates. Wen and Gordon (2014) find that the size of the fluctuation penalty reduces the probability of choosing self-employment in cross-sectional microdata for Canada; however, the size of the estimated effect is found to be modest. Of course, not all self-employed workers are entrepreneurs. Even when they are not risk-takers per se, their incomes tend to be less stable than those of wage/salary workers.

13 Theoretical models suggest reasons why the rate of entrepreneurship may be too elevated or too low, depending on parameter values. See Garcia-Penalosa and Wen (2008) for a discussion of this topic in the context of income taxation.

14 The $8,000 amount is approximately the earnings of an individual working 20 hours per week for 35 weeks per year at minimum wage. People with incomes below this amount generally have zero income tax payable. The exclusion is imposed because our focus is on the tax liabilities of persons facing income shocks.

15 The SLID reports the income tax paid by individuals. However, to avoid any biases arising from unobserved deductions, CTaCS is used to calculate taxes in both the counterfactual case (constant annual income) and the actual income stream.

16 The Canada Child Tax Benefit applies only to specific types of households (e.g., families with dependent children), while the GST-HST credit is intended to offset payments of the GST or HST. We excluded these benefit programs in order to focus on the income-tax system per se. If these refundable tax credits are included in the calculation of the fluctuation penalties, the penalties are slightly reduced. This is because the clawback rates for the benefits tend to flatten the marginal tax rate schedule. To provide a comparison, we replicate Figure 3 (see below) in the Appendix, with all of the major refundable tax credits included.

tax system applies different tax rates to earnings, dividends, interest and capital gains.[17] To account for these differences, each source of an individual's income, in each year of the survey, is converted to 2012 dollars using the Consumer Price Index (CPI) and then averaged across years. Once an individual's average real income is obtained in this manner, for each income source, the amounts are put back into nominal (i.e., current dollar) terms, in order to calculate the annual nominal tax liabilities corresponding to the constant real-income streams. The nominal tax liabilities are then converted back into 2012 dollars. The six-year total constant dollar tax difference (actual versus counterfactual) is divided by the six-year total real income, so that an individual's tax penalty is expressed as a proportion of income. That is, the fluctuation penalty is reported as the *increase* in a taxpayer's average tax rate as a result of having an uneven flow of income.

Box 2 provides a simple example of a taxpayer's liability over two years to illustrate the procedure. The interpretation of the fluctuation penalty for the taxpayer depicted in Box 2 is that, each year, she paid 1 percent of her income more in taxes than would have been the case if she had earned a constant real income.

Results of the Analysis

Size Distribution of the Fluctuation Penalty

The size of the fluctuation penalty for the 2005-2010 period is depicted at each percentile in Figure 1 (up to the 99th percentile). The graph is constructed by listing individuals' fluctuation penalties in the order of their sizes, from lowest to highest. The ordered list is divided into 100 equally-sized groups (percentiles) and the cut-off value of the fluctuation penalty at each percentile is reported on the vertical axis. The 100th percentile is graphed separately in Figure 2, because the size of the penalty is so much larger than for the bottom 99 percentiles.

Figure 1 demonstrates that more than half the population face a fluctuation penalty very close to zero in the 2005-2010 period. It also shows a substantial proportion of individuals facing significant tax penalties. The penalty is 0.75 percentage points at the 90th percentile and 1.5 percentage points at the 95th percentile. At the 99th percentile, the fluctuation penalty rises to more than four percentage points. This means that these individuals paid at least 4 percent of their average annual income more in taxes per year than they would have if their real incomes had been constant.[18]

Figure 2 shows the fluctuation penalty for the 1 percent most-affected taxpayers (i.e., the 100th percentile). This top 1 percent is reported in six equally sized groups of individuals, with average values of the fluctuation penalty given for each of these groups.[19] It can be seen that some taxpayers face fluctuation penalties larger than 14 percent of their income. This is a considerable addition to their average tax rate. As reference points, the statutory personal income tax rate evaluated at the average industrial wage in 2010 was close to 15 percent,

17 These tax-rate differences are not necessarily violations of horizontal equity, because they are intended to offset the payment of corporation income tax in order to preserve neutrality between incorporated and unincorporated business ownership.

18 Figure 1 shows that there are also individuals facing negative fluctuation penalties or, in other words, fluctuation bonuses. This may occur because a low income in a given year may qualify the individual for tax credits that vanish at the individual's six-year average income. In such cases, averaging can be disadvantageous to the taxpayer.

19 Thus, each group represents one-sixth of 1 percent of the total sample.

Box 2: Illustrative Calculation of the Fluctuation Penalty

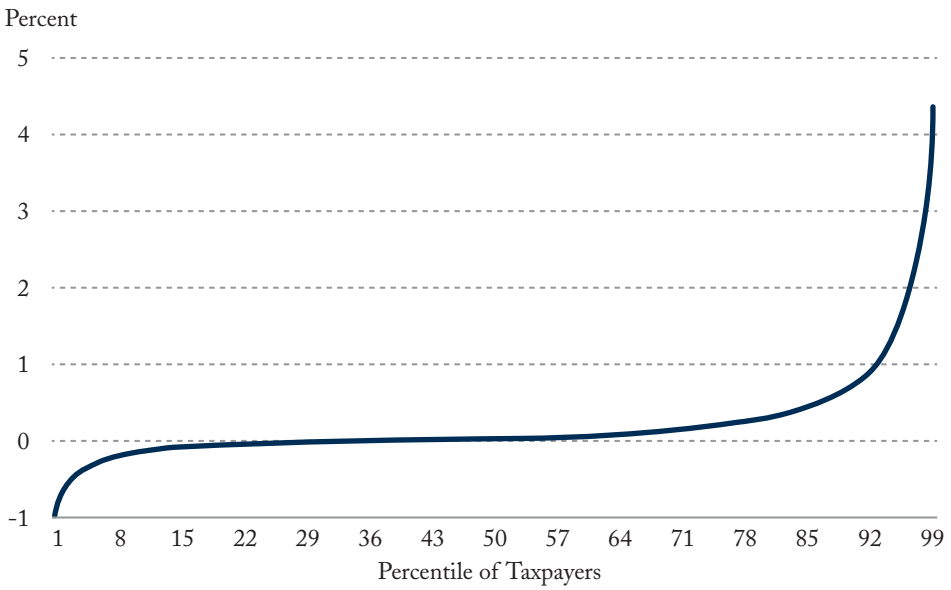
Assume a Quebec resident in 2009 and 2010 who is single, has no dependents and whose sole income is employment earnings. The first three columns in the table below show the tax year, the individual's taxable income and the corresponding tax liabilities, as determined by a tax calculator. Column (4) gives the value of the CPI, which is used to adjust for price inflation so as to express values in terms of real purchasing power. The base year for the calculation is 2012, which means that dollar amounts in 2009 and 2010 are converted to their 2012 dollar equivalents.[a] Column (5) expresses the taxes in column (3) in terms of 2012 dollars. The total two-year "real" tax liability is shown at the bottom of the column. Similarly, column (6) expresses the incomes in column (2) in terms of 2012 dollars. The individual's total real income is shown at the bottom of this column and the average annual real income is half of the total; i.e., $78,827.50 (2012 dollars). Column (7) then converts this average real income into current dollar amounts in 2009 and 2010.[b] This step is necessary to calculate the hypothetical tax liabilities corresponding to a constant real income, which are provided in column (8). Having obtained these tax liabilities in 2009 and 2010, the amounts are converted again to 2012 dollars in column (9), with the total amount shown at the bottom of the column. To obtain the fluctuation penalty for this individual (over a period of two years), the total at the bottom of column (9) is subtracted from the total at the bottom of column (5), and the difference is divided by the total real income indicated at the bottom of column (6).

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Year	**Income**	**Tax**	**CPI (= 121.7 in 2012)**	**Tax in 2012 Dollars**	**Income in 2012 Dollars**	**Current Dollar Value of Average Real Income**	**Hypothetical Tax Bill In Current Dollars**	**Hypothetical Tax Bill in 2012 Dollars**
2009	$50,000	$12,308	114.4	$13,093	$53,191	$74,099	$21,555	$22,930
2010	$100,000	$32,971	116.5	$34,443	$104,464	$75,459	$22,038	$23,022
				Total = $47,536	Total = $157,655			Total = $45,952

a To convert an amount, $X, in 2009 to its 2012 dollar equivalent, multiply $X by the CPI in 2012 and divide by the CPI in 2009.

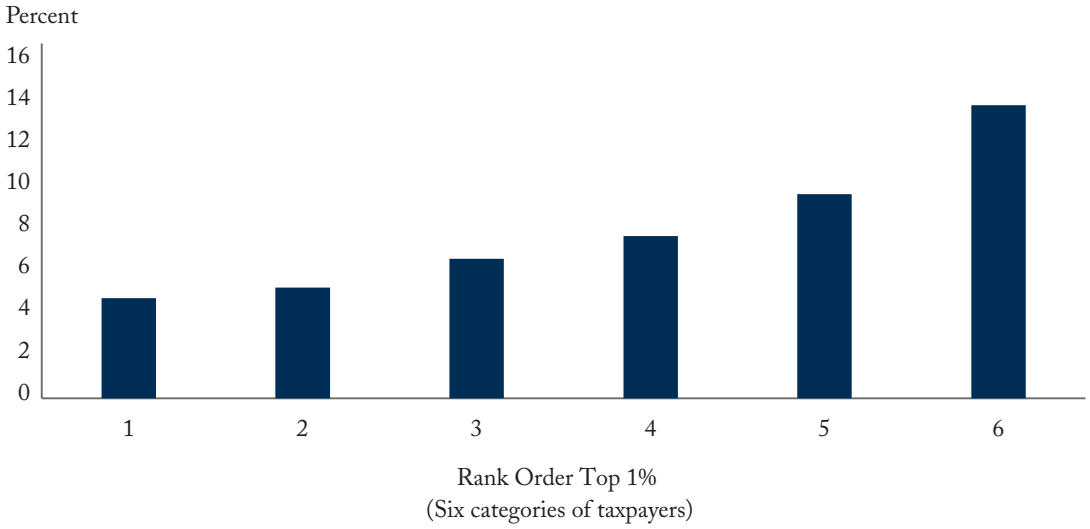
b To convert an amount, $Y, in 2012 to 2009 dollars, multiply $Y by the CPI in 2009 and divide by the CPI in 2012.

Figure 1: Size of Fluctuation Penalty by Percentile (Percentiles 1 to 99)



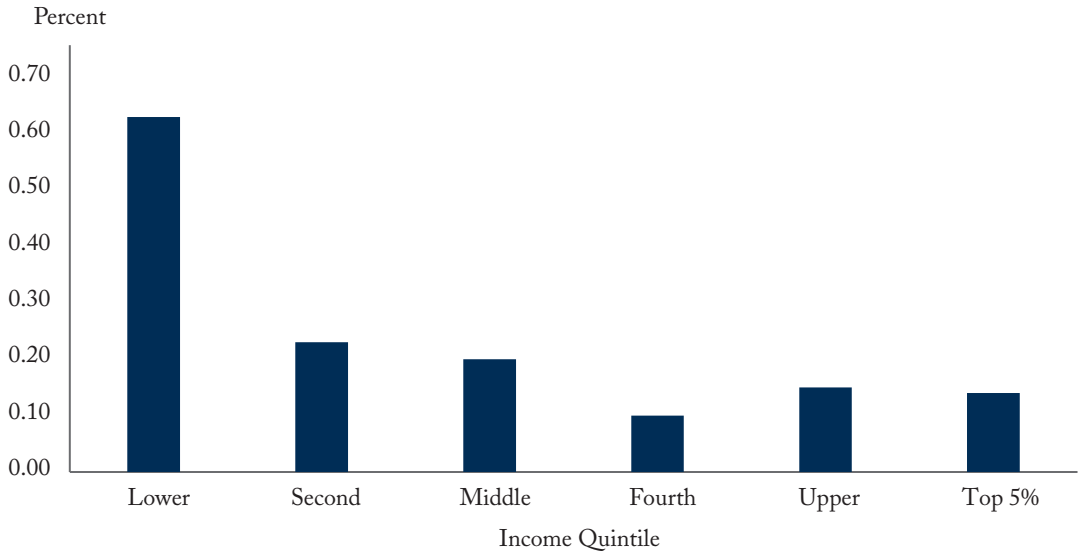
Source: Authors' calculations.

Figure 2: Size of Fluctuation Penalty by Rank Order for Top 1% (Percentage-Point Change in Taxpayers' Average Tax Rate)



Source: Authors' calculations.

Figure 3: Average fluctutation Penalty by Income Quintile (Percentage-Point Change in Taxpayers' Average Tax Rate)



Source: Authors' calculations.

while for individuals earning more than $120,000 the statutory tax rate was approximately 30 percent (Torres et al. 2012).[20]

Fluctuation Penalty by Income Group

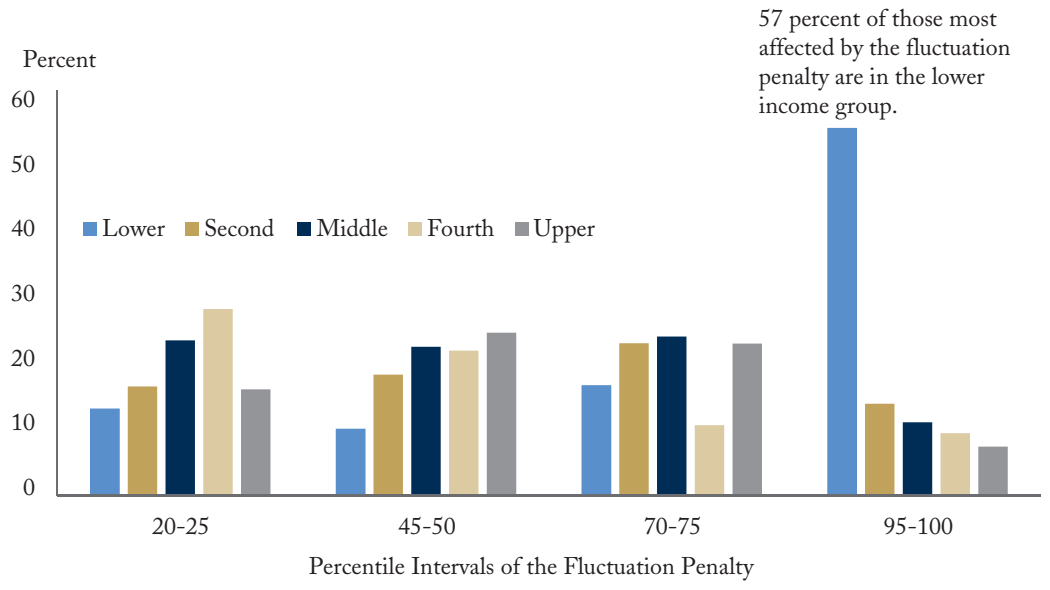
Figure 3 shows how the fluctuation penalty varies across the income spectrum in the 2005-2010 period. The penalty is highest for poorer individuals. Indeed, individuals in the first quintile of the income distribution faced, on average, an implicit surtax of 0.63 percentage points. This is likely attributable to their inability to carry forward the basic personal amounts for themselves and their dependents. In contrast, the average penalty on the top 5 percent of incomes was much lower, at 0.14 percentage points. These findings suggest that the fluctuation penalty is a source of vertical inequity. A potential remedy is to permit carry forwards or carry backs of basic personal and spousal tax credits, which, in effect, is a form of income averaging.

Figure 4 shows the proportion of individuals in each income-distribution quintile, at various fluctuation penalty intervals of five percentiles. It reveals, first of all, that a substantial proportion (57 percent) of individuals in the 95th-100th percentile-interval are from the bottom income-distribution quintile. This reinforces the observation that low-income individuals are relatively more susceptible to paying more tax due to uneven income over the years.

Furthermore, Figure 4 also demonstrates that, within each percentile-interval of the fluctuation penalty, there is a substantial presence of individuals

20 The average 2010 Canadian annual personal income was about $45,000.

Figure 4: Proportion of Taxpayers in Each Income Quintile, at Selected Percentile-Intervals of the Fluctuation Penalty



Source: Authors' calculations.

from each income quintile. This suggests a horizontal inequity, as some high/low income recipients face small fluctuation penalties, while others face large ones.

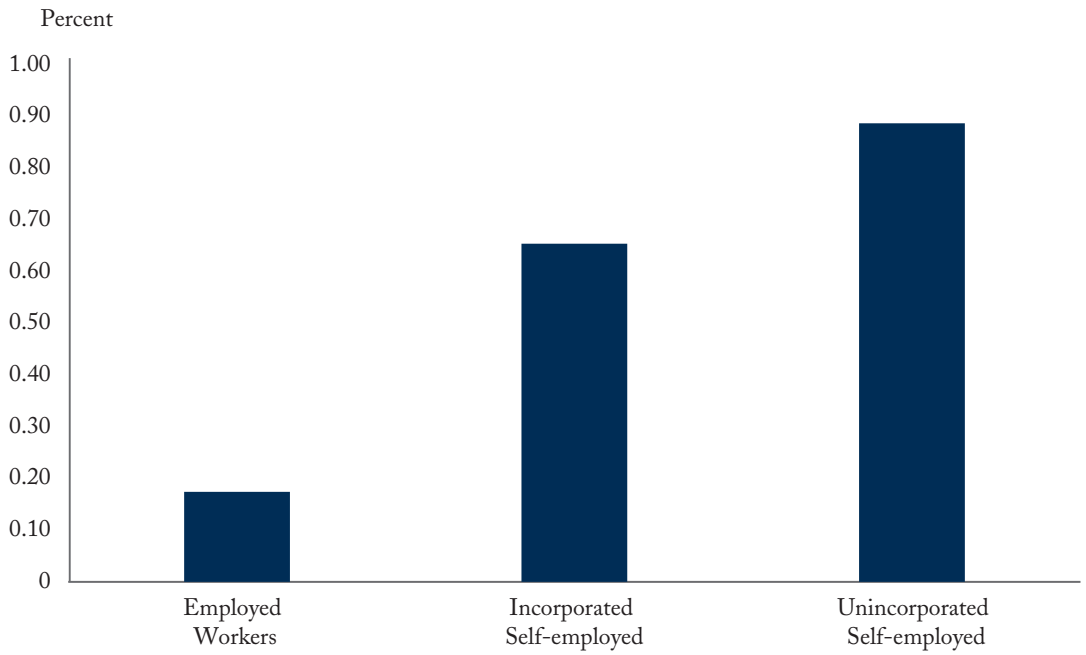
Fluctuation Penalty by Mode of Employment

Figure 5 provides the average size of the fluctuation penalty separately for wage/salary workers, the incorporated self-employed and the unincorporated self-employed. It shows that the fluctuation penalties impose a substantially greater burden on self-employed individuals than on wage/salary workers. For example, the penalty is about 0.17 percentage points for wage/salary workers, but 0.65 percentage points and 0.89 percentage points for incorporated and unincorporated self-employed individuals, respectively.

This observation raises the concern that the fluctuation penalty may affect economic behaviour. If individuals make an occupational choice between relatively risky self-employment and regular employment on the basis of the expected pecuniary rewards, then the additional tax burden implied by the fluctuation penalty has the potential to discourage self-employment.[21]

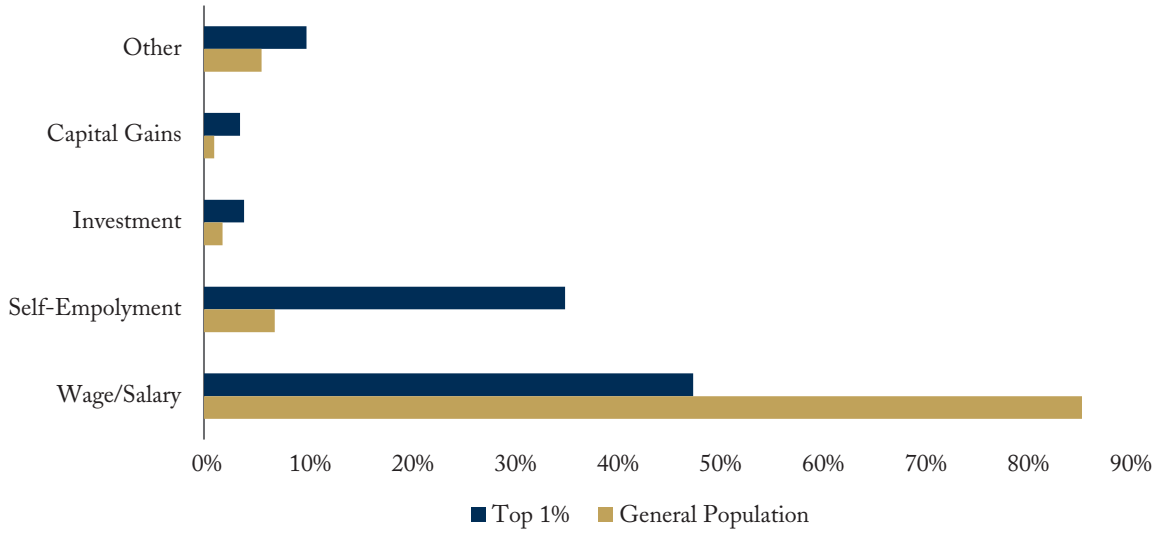
21 To some extent, RRSPs can be used to income average. The tax calculations reported here factor in estimated amounts of RRSP contributions, based on aggregate data on contributions by income category and by self-employed versus wage/salary workers.

Figure 5: Average Fluctuation Penalty by Mode of Employment (Percentage-Point Change in Taxpayers' Average Tax Rate)



Source: Authors' calculations.

Figure 6: Relative Income Sources of Top 1% of Fluctuation Penalty versus General Population (2005-2010)



Source: Authors' calculations.

Relative Income Sources of Taxpayers with the Largest Fluctuation Penalties

Figure 6 compares the proportion of total income received from different major income sources between the group of individuals in the top 1 percent of fluctuation penalty distribution and the whole population of taxpayers (in the sample). Unincorporated self-employment income and capital gains stand out as disproportionately important for those facing the largest fluctuation penalty, compared to the general population. These points underscore the vulnerability of entrepreneurs and those who realize a lump sum of capital gains in a given year.[22]

Evaluation of Income-averaging Provisions

The purpose of income averaging is to equalize, as far as it is feasible, the tax liabilities among individuals who have the same total income over several years. Averaging schemes should generate a fair distribution of tax burdens and remove behavioural incentives arising from the tax effects of fluctuating incomes. Feasibility must take into account the taxpayer's cost of compliance and the ease of public administration.

This section provides an assessment of alternative averaging provisions, based on their effectiveness in reducing the sizes of the fluctuation penalties. These penalties are recalculated under the assumption that an averaging provision is in place. The calculations assume that tax filers use the income-averaging provisions only when it is beneficial to them. Such provisions are always voluntary – the taxpayer has the option, but not the obligation, to use income averaging.

Two income-averaging provisions described previously in Box 1 are examined. The third method, block averaging, is not analyzed since its application essentially replicates the method of calculating the fluctuation penalty by comparing the actual tax burden with the alternative of averaging income across years. Consequently, block averaging would, in theory, eliminate the fluctuation penalty perfectly. However, in practice, taxpayers must exercise considerable foresight to determine when it is optimal to declare a block of years for income averaging, because blocks of years are not permitted to overlap. Hence, the realized benefits from block averaging will not fully offset the fluctuation penalty.[23]

Figure 7 compares the benefits of the general income-averaging formula and the general forward-averaging mechanism. It depicts the average size of the reduction in the fluctuation penalty in each income quintile.[24]

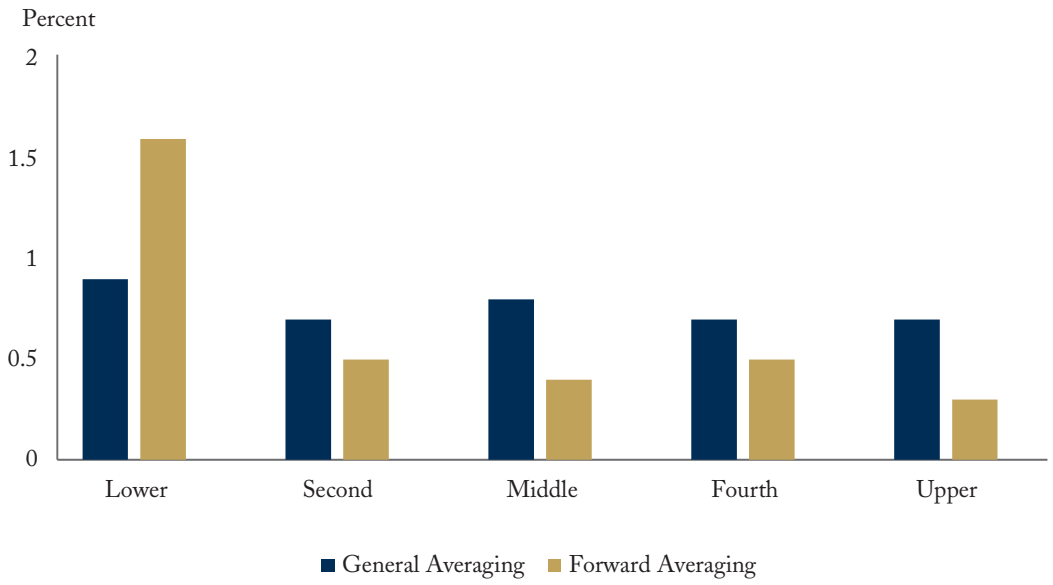
In assessing the general income-averaging approach, we use the 2010 tax year, with the prior years, 2006-2009, to implement the averaging.

22 While a lifetime capital gains exemption on the shares of small business corporations reduces the fluctuation penalty for certain owners, the exemption does not apply to capital gains on financial portfolios or on the sales of non-farm or fishing property. In the 2010 tax year, 58,800 people reported a capital-gains deduction, and the total capital-gains deduction was $3.6 billion. For those claiming a capital-gains deduction on the disposition of small business shares, 43 percent had annual incomes over $100,000 while 29 percent had an annual income above $150,000. Meanwhile, 1,843,400 individuals reported taxable capital gains in 2010 on $17.5 billion. The aggregate statistics on capital gains are from Canada Revenue Agency's *Final Statistics* 2012 Edition (2010 tax year).

23 Of course, we cannot take into account the tax-planning aspects of block averaging with only six years of income data for the individuals in the sample, as this would require comparing different five-year blocks.

24 Individuals who are made worse off by income averaging would not invoke the provision and hence derive zero tax savings. They are excluded from the calculation of the average tax reduction from income averaging. Hence, the average tax reduction should be interpreted as being conditional on benefiting from the averaging provision.

Figure 7: Reduction in the Average Tax Rate as a Result of Income Averaging, by Income-Quintile



Source: Authors' calculations.

In assessing the forward-averaging method, we shift 20 percent of income from 2007 to 2010 and compute the impact of this shift on each taxpayer's total tax liability for the two years. The shifting of income is only carried out if it is favourable to the taxpayer. Here, it is assumed that the taxpayer repays the tax deferral by the final year of the sample (2010). This diminishes the value of the forward-averaging method, relative to what it would be with a longer time horizon and if the tax repayment year were planned rather than arbitrarily imposed. Hence, the taxpayers' benefits from forward averaging are likely underestimated in the simulation. The parameters of the various income-averaging methods correspond mainly to the provisions as they existed in the 1980s.[25]

Taxpayers' savings from the general income-averaging formula is equivalent to a reduction in the personal average tax rate of individuals in the lowest quintile of almost 0.9 percentage points and by about 0.7 percentage points in the other quintiles.[26] The benefit of the income-averaging formula could be further increased and better targeted by reducing the threshold factor and relaxing the requirement

25 Various minor details of averaging mechanisms are not implemented in the calculations reported here. The results should be interpreted as indicative rather than definitive. Moreover, experts have criticized some of the parameter values of income-averaging provisions used in the 1980s. We address one of these criticisms by reducing the current income threshold from 120 percent to 115 percent of the average income of the previous four years in the general averaging formula. The best design for each of the averaging schemes is, therefore, something that future research needs to explore.

26 These are average values for individuals who would obtain positive tax savings from invoking the provision. Individuals who would not benefit, and hence who would not apply the averaging method, are not included.

that the taxpayer's current income must be greater than the past year's.

The corresponding reductions in taxpayers' average tax rates from forward averaging are 1.6 percentage points for the bottom quintile and about 0.5 percentage points in the other quintiles.[27] The benefits of forward averaging can be improved for lower and middle income individuals by reducing the withholding rate on the portion of income shifted to the future.

Overall, the average tax savings from the income-averaging methods are modest, but the average values mask larger benefits for some individuals. Income-averaging methods would enhance tax fairness and could improve incentives for entrepreneurship and other risk-taking endeavours by reducing the tax burdens on individuals who receive large, irregular lump sums or face highly volatile income streams. The general averaging formula may serve as the best single remedy for the tax penalty. It is relatively easy to implement, since it is formula-based.[28]

Recommendations and Conclusion

In light of the evidence presented, the general income averaging and the forward-averaging formulae should be reintroduced into the tax code. While the specific parameters of the methods need to be further examined to ensure practicality and fairness, we tentatively suggest that, in the case of general averaging, the threshold factor be reduced, and in the case of forward averaging, the withholding rate on the carry-forward should be lower than the top marginal tax rate and that a reasonable time limit be given for the repayment of the deferred tax liability.

The fluctuation penalty is the excess amount of personal income tax paid by individuals with volatile or irregular incomes. This *Commentary* examines the equity and efficiency issues raised by the fluctuation penalty and reports estimates of the sizes of such penalties in Canada, using a six-year wave of longitudinal data from 2005 to 2010. The empirical results from the analysis show that the fluctuation tax penalty is negligible for the vast majority of Canadians, but accounts for more than 4 percent of the average annual incomes for about 1 percent of the population. The individuals most affected by the fluctuation tax penalty are generally characterized as lower-income or self-employed. Those who experienced capital gains are also predominant among the top percentile of penalty-payers.[29]

Income averaging refers to provisions in the tax code that can be used to mitigate the fluctuation penalty. The *Commentary* summarizes the Canadian experience with different methods of income averaging and uses simulations of tax liabilities to evaluate the different methods.

Canada, like the United States, abolished the policy of income averaging for tax purposes in the 1980s. This change occurred for three reasons.

27 The correlation between the size of an individual's fluctuation penalty and the benefit the individual derives from the general averaging formula is 48 percent, suggesting that the method targets reasonably well those who are most affected. The correlation is much weaker for forward averaging, but this is likely due to the fact that this method requires active tax planning by the taxpayer, rather than a mechanical rule. Indeed, most taxpayers are unlikely to achieve much tax savings by mechanically shifting income from 2007 to 2010.

28 Mintz and Wilson (2013) also argue that income-averaging provisions would improve retirement savings by increasing the rate of return on investments made outside of registered plans.

29 Capital gains are received not only by individuals with high incomes in Canada. The bottom 30 percent of the employment earnings distribution earns 25 percent of capital gains, while the share of capital gains received by the top 10 percent is 37 percent (Thivierge and Laurin, 2017).

First, critics argued that the design of the averaging formulas failed to achieve the goal of tax relief for individuals with volatile incomes. Second, tax reforms reduced the number of tax brackets and substantially lowered marginal tax rates during the 1980s, thereby reducing the perceived problem. Third, the cost of administering and complying with income averaging formulas was deemed to be unattractive.

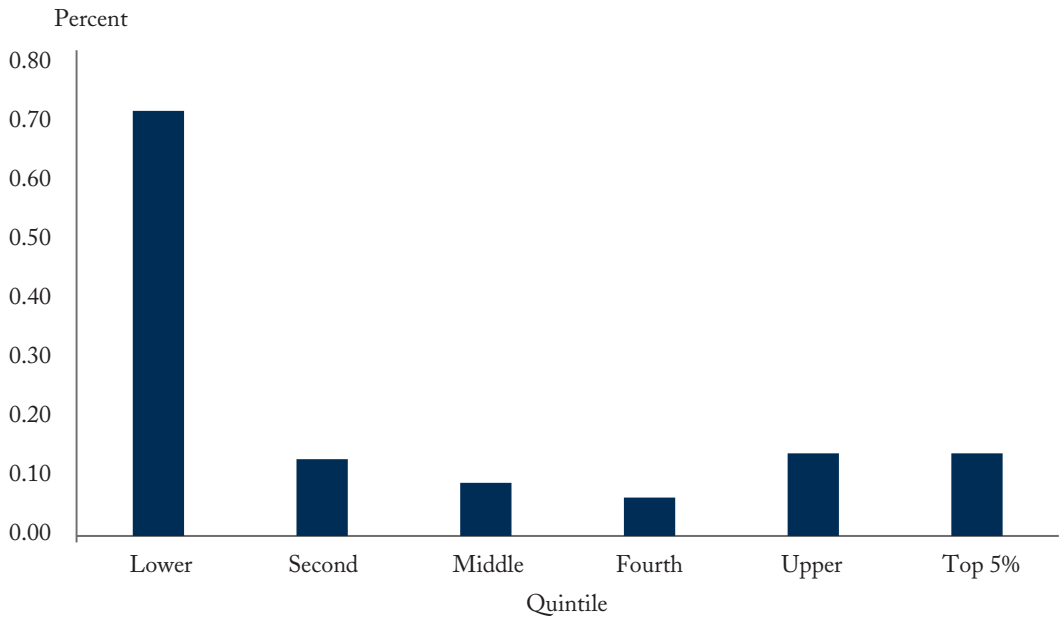
Nevertheless, there are reasons to reconsider general income-averaging provisions. Income volatility has risen substantially since the 1980s. Furthermore, from the administrative and compliance standpoints, general income averaging is entirely mechanical, hence requiring no subjective interpretations of tax law. Today, most taxpayers file their taxes online using off-the-shelf software. Just as tax software can retain and link a taxpayer's previous years' income and tax information such as depreciation on the capital assets of self-employed individuals, the software could easily calculate the general income-averaging formula. Taxpayers could then use the software to determine if averaging is beneficial for them.

Since the general income-averaging formula is relatively easy to implement – compared to the more complex forward-averaging method – it may serve as the best single remedy for the tax penalty.

APPENDIX

Figure A1 reproduces Figure 3 – the average size of the fluctuation penalty by income quintile – but with the inclusion of all of the major refundable tax credits, notably the Canada Child Tax Benefit as it existed between 2005 and 2010.[30] The effect of the clawback rates on the tax credits flattens the effective marginal tax-rate schedule. Except for the slight increase in the fluctuation penalty in the first quintile, the penalty decreases at all other income ranges. The increase at the bottom quintile occurs because the effective marginal tax rate jumps at the income level at which the phase out of the child tax benefit begins (e.g., $23,858 for the second half of 2010).

Figure A1: Fluctuation Penalty by Income Quintile when all Refundable Tax Credits are Included (Percentage-Point Change in Taxpayers' Average Tax Rate)



Source: Authors' calculations.

30 Recall that the income quintiles are constructed in this *Commentary* for the population of workers with six-year average incomes greater than $8,000 (2012 dollars). Individuals with incomes below this amount are excluded from our calculations.

REFERENCES

Baker, Michael, and Gary Solon. 2003. "Earnings Dynamics and Inequality among Canadian Men, 1976–1992: Evidence from Longitudinal Income Tax Records." *Journal of Labor Economics* 21: 289–321.

Beach, Charles, Ross Finnie, and David Gray. 2010. "Long-Run Inequality and Short-Run Instability of Men's and Women's Earnings In Canada." *Review of Income and Wealth* 56: 572-596, 2010.

Department of Finance Canada. 1981. "Budget Papers, Supplementary Information and Notices of Ways and Means Motions on the Budget." Tabled in the House of Commons by the Honourable Allan J. MacEachen, Minister of Finance. November 12.

Ferede, Ergete. 2013. "Tax Progressivity and Self-Employment: Evidence from Canadian Provinces." *Small Business Economics* 40(1): 141–153.

Garcia-Medina, Cecilia, and Jean-François Wen. 2017. "Income Instability and Fiscal Progression." *Canadian Journal of Economics.* Forthcoming.

Garcia-Penalosa, Cecilia, and Jean-François Wen. 2008. "Redistribution and Entrepreneurship with Schumpeterian Growth." *Journal of Economic Growth* 13 (1): 57-80.

Gentry, William. M., and R. Glenn Hubbard. 2000. "Tax Policy and Entrepreneurial Entry." *American Economic Review Papers and Proceedings* 90(2): 283--287.

Gordon, Daniel, and Jean-François Wen. 2017. "Tax Penalties on Fluctuating Incomes: Estimates from Longitudinal Data." *International Tax and Public Finance.* Forthcoming. DOI 10.1007/s10797-017-9456-1.

Hacker, Jacob. 2004. "Privatizing Risk without Privatizing the Welfare State: The Hidden Politics of Social Policy Retrenchment in the United States." *American Political Science Review* 98 (2): 243–260.

Industry Canada. 2012. *Key Small Business Statistics*. Ottawa: Public Works and Government Services Canada. Available at: www.ic.gc.ca/sbstatistics.

Kaplow, Louis. 2010. *The Theory of Taxation and Public Economics*. Princeton: Princeton University Press.

LaRochelle-Côté, Sébastien, and Sharanjit Uppal. 2011. "The Financial Well-Being of the Self-Employed." *Perspectives on Labour and Income.* Statistics Canada Catalogue no. 75-001-X.

Laurin, Alexander, and Vincent Thivierge. 2017. *Capital Gains Widely Enjoyed, Not Just by Top Earners*, Intelligence Memos, C.D. Howe Institute.

Milligan, Kevin. 2012. Canadian Tax and Credit Simulator. Database, Software and Documentation, Version 2012-1.

Mintz, Jack, and Thomas A. Wilson. 2013. "Reform Proposals for Replenishing Retirement Savings." SPP Research Papers Vol. 6, Iss. 9, School of Public Policy. University of Calgary.

Moffitt, Robert, and Peter Gottschalk. 2012. "Trends in the Transitory Variance of Male Earnings Methods and Evidence." *Journal of Human Resource* 47(1): 204–236.

Ostrovsky, Yuri. 2010. "Long-Run Earnings Inequality and Earnings Instability among Canadian Men Revisited, 1985–2005." *The B.E. Journal of Economic Analysis and Policy.* 10(1): Article 20:1–32.

Pechman, Joseph. 1977. *Federal Tax Policy*, third edition. Washington, DC: The Brookings Institution.

Salyzyn, Vladimir. 1984. *Taxation of Fluctuating Incomes in Canada*, fourth edition. Don Mills, Ontario: CCH Canadian Ltd.

Shin, Donggyun, and Gary Solon. 2011. "Trends in Men's Earnings Volatility: What Does the Panel of Income Dynamics Show?" *Journal of Public Economics.* 95: 973–982.

Torres, Caroline, Kristi Mellbye, and Bert Brys. 2012. "Trends in Personal Income Tax and Employee Social Security Contribution Schedules." OECD Taxation Working Papers, No. 12. OECD Publishing.

Wen, Jean-François, and Daniel Gordon. 2014. "An Empirical Model of Tax Convexity and Self-Employment." *The Review of Economics and Statistics.* 96(3): 471–482.

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