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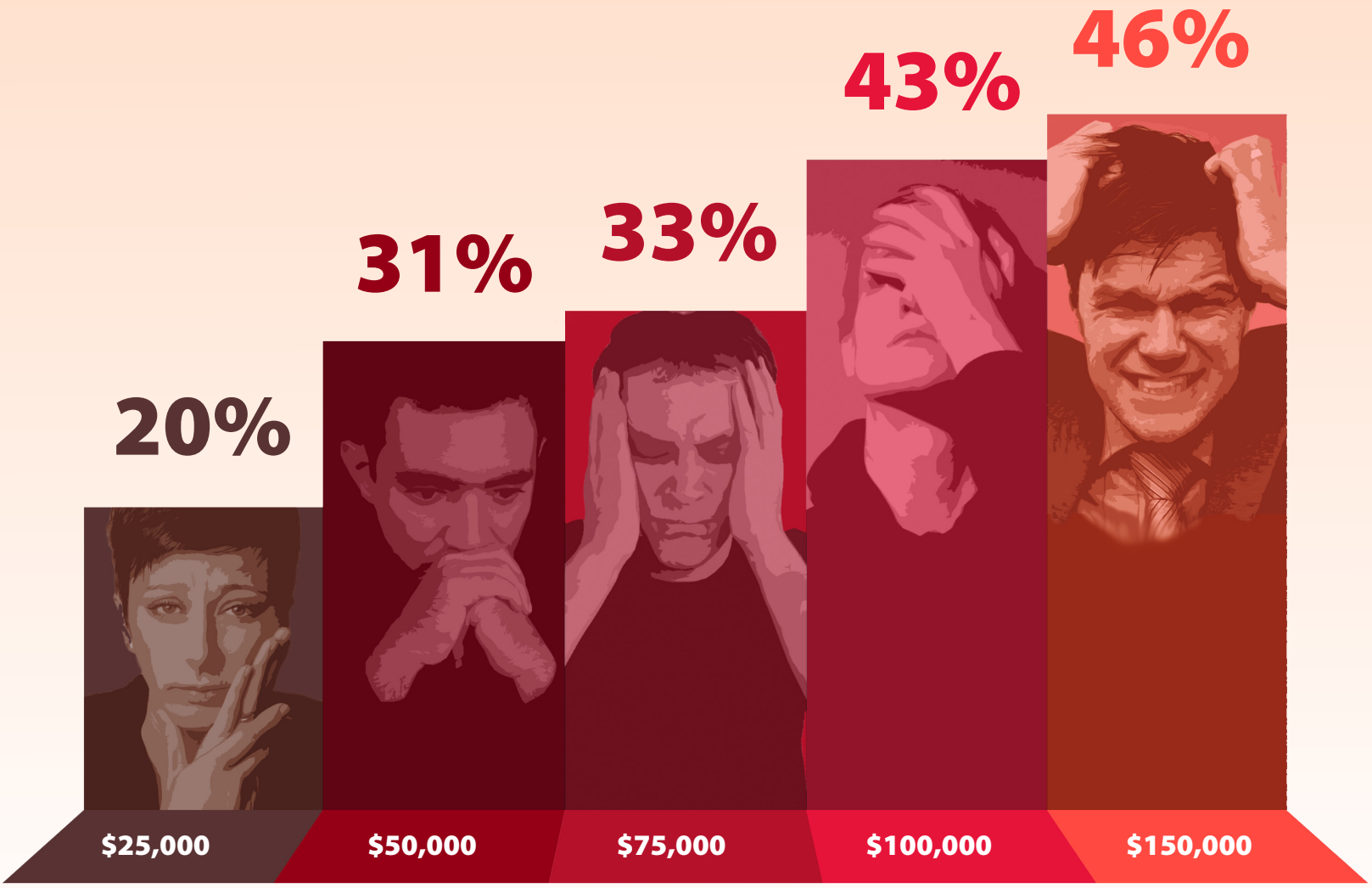
The Economic Costs of Increased Marginal Tax Rates in Canada

by Robert P. Murphy, Jason Clemens and Niels Veldhuis



The tax rates shown are for Ontario and include both federal and provincial statutory rates.

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Executive summary

Both economic theory and empirical investigation show the importance of taxes on the health of the economy. Economists often focus on *marginal tax rates* as particularly important for altering behaviour. A marginal tax rate refers to the extra tax an individual (or firm) will owe to the government for engaging in a little more of the taxed activity. When trying to understand why income taxes have a negative effect on the number of hours someone chooses to work, for example, the marginal tax rate is the most significant factor to consider. That is because the marginal tax rate indicates the amount of tax a person will pay for that *additional* dollar earned.

An extensive literature documents that taxes—particularly progressive income and capital taxes—reduce economic growth, saving and investment, business formation, and job creation. The only question is in the magnitude of the estimated effects. American professors Christina and David Romer have studied several periods in US history and have been able to estimate that a tax increase of 1 percent of GDP has lowered output by roughly 2 to 3 percent. They have also found that past tax increases have led to sharp falls in investment, which ultimately depressed GDP.

Other studies have tabulated results from a wide range of countries and time spans. To take just one example, Padovano and Galli used data for 23 OECD countries from 1951 to 1990, and found that high marginal tax rates and progressive taxes (which take proportionately more from people the higher their income) tended to lead to a drop in long-term economic growth. In a later study, Padovano and Galli found that an increase of 10 percentage points in marginal tax rates decreased the annual rate of economic growth by 0.23 percentage points.

In 1996, Engen and Skinner examined more than 20 studies that looked at the relationship between tax rates and economic growth in the United States and abroad. They concluded from their review that "a major tax reform reducing all marginal rates by 5 percentage points, and average tax rates by 2.5 percentage points, is predicted to increase long-term growth rates by between 0.2 and 0.3 percentage points" (Engen and Skinner, 1996).

In light of the significant role that marginal tax rates play, Canadian policymakers at both the federal and provincial levels should acquaint themselves with Canada's standing against peer countries. Superficially, with a top federal personal income tax rate of 29 percent, Canada appears to enjoy the lightest tax burden among the G7 countries and Australia. However, this appearance is deceptive. Canada places a relatively greater emphasis on *provincial* taxation than do other countries in its peer

group. For example, both Quebec and Ontario have steeply progressive income tax codes, with top rates of 24 and 18.97 percent, respectively.

Another complication that makes international comparisons more difficult is that the personal income tax thresholds in Canada are typically lower than in the other reference countries, meaning that the top rate may not be decisive. In other words, it is misleading to look only at the top marginal rate when it kicks in at different rates around the world. In some countries, the top marginal tax rate begins at a low dollar amount whereas in other countries, the top rate begins at a very high dollar amount. In Canada's case, the federal top rate is low compared to other peer countries *and* the threshold at which that top rate kicks in is also low compared to other peer countries. Taken together, these two adjustments put Canada's tax rates somewhere in the middle of those in the peer countries, underscoring the need for federal and provincial tax relief and reform if Canada wishes to build on past improvements and its current success.

Because of the lower threshold at which the top Canadian rate applies, the comparable US rate (as of 2011) on a single person isn't 35 per cent (the actual US top rate) but instead is only 28 per cent, i.e., less than the Canadian rate of 29 per cent. That is because a person who earns only just enough to get taxed at the 29 per cent rate in Canada would be taxed at 28 per cent in the US. When the combined impact of provincial and state income taxes is included, the US becomes more attractive still, because provincial income tax rates are higher than those in the US states.

Indeed, an individual earning an income that would just place him in the top federal tax bracket in Canada (as of 2012) would face a higher total income tax rate *in every single province* than in any of the US states. Given the relative ease with which highly skilled workers and businesses can move between Canada and the United States, the higher combined federal and provincial marginal income tax rates can lead to serious consequences for the Canadian economy.

A broader international comparison reveals a similar pattern. Based solely on the top marginal income tax rate at the federal (or central government) level, Canada has the lowest rate among the G7 countries plus Australia. Once sub-central governments are included, and accounting for tax bracket thresholds, Canada falls to the middle of the group. For example, for people earning 167 percent of the average wage, the combined federal and provincial marginal personal income tax rate in Canada is 3.7 percentage points higher than in the United States, 5.3 percentage points higher than in France, and a whopping 10.0 percentage points higher than in Japan.

The most obvious solution to the relatively high total burden is income tax reform, particularly at the provincial level and especially in Quebec and Ontario. These two provinces suffer from the worst of both worlds: they have extremely high top marginal rates, *and* their tax codes are very progressive, so the more successful people are, the relatively more tax they pay.

The principles for income tax reform are straightforward: flatten rates and broaden the tax base (by reducing or eliminating tax credits, deductions, etc.). There is no need to insist that the changes be "revenue neutral." An explicit tax cut would promote investment, job creation, and economic growth more effectively than merely restructuring in a revenue-neutral way.

I Introduction

Both economic theory and history show the important role that taxes play in economic growth, employment, saving, investment, business formation, and other desirable indicators. In particular, a large body of literature documents the importance of *marginal income tax rates* to the health of a nation's economy.

At a superficial level, and considering only the top federal personal income tax rate, Canada appears to enjoy the lightest tax burden among the G7 countries and Australia. However, this appearance is deceptive. Canada places a relatively greater emphasis on *provincial* taxation than do other countries in its peer group. Another complication is that the personal income tax thresholds in Canada are typically lower than in the other reference countries, meaning that the top rate may not be decisive. In other words, it is misleading to look only at the top marginal rate when it kicks in at different rates around the world. In some coutries, like Canada, the top marginal tax rate begins at a low dollar amount whereas in other countries, the top rate begins at a very high dollar amount. In Canada's case, the federal top rate is low compared to other peer countries *and* the threshold at which that top rate kicks in is also low compared to other peer countries. Once adjustments for these two factors are made, Canada falls to somewhere in the middle of the group of peer countries, underscoring the need for provincial tax relief if Canada wishes to build on past reforms and its current success.

The paper is organized as follows. Section II provides an extensive review of the economic literature on the effect and importance of marginal income taxes. Section III explains the thresholds and rates for Canadian personal income taxes at the federal and provincial levels. Section IV compares Canada to select US states. Section V compares Canada to a broader group of other advanced economies (namely, the other G7 countries and Australia). Section VI explains that marginal rates are not the whole story because "clawbacks" and tax credits can also affect the *effective* marginal rates facing taxpayers in certain income ranges. Finally, Section VII concludes and offers recommendations.

II The Importance of Marginal Tax Rates in Decision Making: A Review of Existing Research

Economists agree widely that taxes influence many of our economic decisions: how we divide our time between work and leisure, whether to find a job or to incur the risks associated with entrepreneurship, how much we save and how much we invest in our own education, and whether we look for either legal or illegal ways to reduce the amount of tax we pay. Businesses are also affected by taxation, because taxes add to the cost of certain production inputs, making them more expensive and leading to potentially inefficient changes in the mix of inputs used by the firm to carry on its enterprise.

Taxes influence behaviour by artificially inflating the price of some goods relative to others. The distortion in relative prices creates an incentive to over-consume those goods that have been made artificially cheap, while simultaneously under-consuming the artificially expensive goods. Furthermore, relatively cheap goods will be over-produced by businesses while the converse is true for those goods that have become relatively expensive. As such, the distortion in relative prices attributable to taxation can lead to economic outcomes that are suboptimal, whereby scarce resources are misallocated.

Although the average citizen may think that the "cost" of taxation is the amount of money transferred to the government, this isn't how economists actually analyze the issue. The revenues raised by the government aren't a loss to society, because they could be spent on something useful (or simply transferred back to citizens). The mere rearrangement of resources *per se* doesn't make people poorer on average.

However, economists *do* think taxes can have a negative effect on social wealth, meaning they can make everyone poorer on average. This occurs through what is called *deadweight loss*, which refers to the missed opportunities for beneficial exchanges that do not occur because of the imposition of a tax. For example, if there are no taxes levied on apples, then producers will keep selling apples to consumers so long as the producers value the money they receive more than the apples they sell, and the consumers value the apples they receive more than the money they spend to obtain them. Producers and consumers will trade apples for money up until the point at which these "gains from trade" are exhausted.

Yet with a tax levied on apples—perhaps $1 per kilogram—there is now a wedge placed between the amount of money the consumer spends on a pound of apples, versus the (after-tax) revenue the producer receives for selling that same pound of apples.

This means the total number of apples bought and sold will be *lower* than in the non-tax scenario. The producers will end up retaining some apples that they value less than the consumers do. Thus, the distribution of apples (and money) in society is suboptimal because of the apple tax; both producers and consumers would be happier if more apples and money were swapped, but this won't happen because of the tax wedge.

Economists have shown theoretically that with standard assumptions, the deadweight loss—the forfeited gains from trade due to a tax—is proportional to the *square* of the tax rate. Thus, doubling the tax rate will lead to a quadrupling of the social burden or opportunity cost of the tax.

Besides the pure theoretical treatment, there is also an extensive body of empirical research investigating the impact of taxation on a variety of important economic decisions. A previous Fraser Institute publication by Milagros Palacios and Kumi Harischandra (2008) offers a thorough review of earlier literature studying the impact of taxation on a variety of economic activities including work, investment, and entrepreneurship. Furthermore, there has been a steady growth in our understanding of the mechanisms through which taxes influence our economic decisions, as additional insights are drawn from new research using increasingly sophisticated empirical methods. While older strands of research focused on questions regarding how taxes influence specific decisions related to work, savings and investment, much of the research undertaken over the past decade has focused on a more comprehensive measure of the impact of taxes on economic behaviour (Feldstein, 1995a; Giertz, 2007, 2008, 2010a, 2010b; Saez. et al. 2012; Keane and Rogerson, 2012).

There are two commonly used measures of the tax burden: the average tax rate and the marginal tax rate. The *average tax rate* reflects the total amount of income extracted by taxes. *Marginal tax rates* reflect the additional taxes that would be levied against any additional earned income, often described as *marginal income*. For example, if the first $50,000 of income is taxed at 10 percent, while income above $50,000 is taxed at 20 percent, then someone making $100,000 would pay $15,000 in total tax, for an *average tax rate* of 15 percent, but would face a *marginal tax rate* of 20 percent.

The marginal tax rate plays an important role in influencing individual behaviour because it affects the outcome of decisions regarding whether to engage in more of a particular activity, like choosing to work more hours during a certain period of time, whether to take a new job that involves higher pay but a longer commute, or whether to invest more in one's education.[1] As such, there is a consensus that marginal tax rates are a central parameter when investigating the impact of taxation on incentives and individual behaviour (Palacios and Harischandra, 2008; Chen, 2000). The remainder of this section will review recent research addressing how marginal tax

1 Whether marginal or average tax rates matter depends in many ways on the decision being made. For an accessible summary of this issue, see Jones, 2012a.

rates influence incentives and economic behaviour, and then summarize the important findings.

The impact of taxation on business activity, investment, and economic growth

Extensive research has shown that high marginal tax rates (MTR) inhibit economic growth, business activity, and investment (Koester and Roger Kormendi, 1989; Engen and Skinner, 1996; Wyslenko, 1997; Daveri and Tabellini, 2000; Padovano and Galli, 2001, 2002; Lee and Roger Gordon, 2005; Romer and Romer 2010).

Economic growth

Most recently, American professors Christina and David Romer (2010) analyzed the impact of changes in the level of taxation on economic growth. In this important study, the authors investigated the effects of tax reforms on GDP in the United States in the post-war period. The study found that such tax changes had very large effects on GDP: a tax increase of 1 percent of GDP lowered output, as measured by real GDP, by roughly 2 to 3 percent. They also found that tax increases led to sharp falls in investment, which ultimately depressed GDP.

A pair of studies by Fabio Padovano and Emma Galli (2001; 2002) confirmed the detrimental effects of high marginal tax rates on economic growth. Using data for 23 OECD countries from 1951 to 1990, Padovano and Galli (2001) found that high marginal tax rates and tax progressivity tended to be negatively associated with long-term economic growth. They followed up their original study in 2002 and found that an increase of 10 percentage points in marginal tax rates decreased the annual rate of economic growth by 0.23 percentage points.

Economists Young Lee and Roger Gordon (2005) explored the influence of corporate (business) taxes on economic growth. Using data for 70 countries for the period from 1970 to 1997, they found that increases in corporate tax rates led to lower growth rates within countries over time. In fact, their analysis suggested that a reduction of 10 percentage points in corporate taxes would raise the annual growth rate of countries by one to two percentage points.

One survey by Engen and Skinner (1996) examined more than 20 studies looking at evidence on tax rates and economic growth in the United States and abroad. They concluded from their review of these studies that "a major tax reform reducing all marginal rates by 5 percentage points, and average tax rates by 2.5 percentage points, is predicted to increase long-term growth rates by between 0.2 and 0.3 percentage points" (Engen and Skinner, 1996).

Business activity and investment

In a comprehensive earlier review of the literature analyzing the effects of taxation on regional business development and decisions made by businesses pertaining to how they select their locales, Syracuse University economist Michael Wasylenko (1997) notes that regional tax systems have consistently been found to be an important factor—though not the only factor—for businesses choosing where to operate. Professor Wasylenko notes a near consensus in the literature confirming that taxes have a discernible impact on employment, investment, business creation, plant expansion, and location decisions (all indicators of robust economic growth and development). Wasylenko also pays considerable attention to studies that look at inter-regional differences in tax treatment to estimate the responsiveness of business location decisions and regional economic activity (based on employment, investment, income growth, etc.) to changes in tax rates. Based on an overview of the findings from earlier literature, the author suggests that a 10 percent increase in total business taxes reduces business presence (establishment/wind-downs plus interregional movement/location choice) by approximately 2 percent relative to other jurisdictions. The author underscores that business location decisions depend not only on the tax levels within a given jurisdiction, but also on the extent to which any given jurisdiction's business taxes are above or below the average of competing jurisdictions. More specifically, the larger the difference between a particular jurisdiction's business taxes and the average business tax level across competing jurisdictions, the larger the effect on the decision of businesses when choosing a location for their operations when they can choose from among multiple jurisdictions.

Austan Goolsbee (2004) looked at US state-level data for industries in the retail trade sector in 1992. He analyzed several indicators reflecting the size of the corporate sector, including the share of companies, the employment share, and sales. Goolsbee found that corporate taxes had a large impact on the rate of incorporation: raising the corporate tax rate by 10 percent reduces the proportion of firms that operate as corporations by 5 to 10 percent, and the corporate share of sales and employment by 2 to 6 percent.

Tax rate progressivity and economic growth

Several studies have evaluated the effects of tax progressivity (which traditionally describes applying higher tax rates to higher income groups) (Caucutt et al., 2000; Widmalm, 2001; Cassou and Lansing, 2004) on economic growth. These studies have examined the impact of shifting from a tax system with a rising MTR to a flat-tax rate system. A tax system with a rising MTR uses tax brackets to classify incomes, with

higher income brackets taxed at higher rates. On the other hand, a flat tax is essentially a tax with a constant tax rate levied on both household and business income.

A paper by Elizabeth Caucutt and colleagues (2000) using US data found that changes in the progressivity of tax rates can have important effects on growth. In particular, they found that a tax system with a rising MTR reduced growth by 0.13 to 0.53 percentage points. Similarly, Stephen Cassou and Kevin Lansing (2004) assessed the growth effects of shifting from a system with a rising MTR to a flat tax. The authors predicted that a shift to a flat-tax system without changing the amount of tax revenue collected could permanently increase per-capita growth by 0.009 to 0.143 percentage points per year relative to a progressive tax system.

Marginal tax rates and work

A vast body of research looks at the relationship between taxation and an individual's willingness to work—commonly referred to as an individual's *labour supply*. Given the fixed number of hours in a week, individuals can spend their limited time in two basic pursuits: they can work in order to earn income, or they can engage in recreational activities (leisure). The main assumption underlying this choice is that work is burdensome and individuals must be compensated accordingly, while leisure is pleasurable but unremunerated. Consequently, people must make two sequential decisions: (1) whether or not to work; and (2) if they choose to work, how much time will they allocate to their labour supply. As in most market-based decisions, labour supply decisions are guided by the relative prices and costs that could be incurred; in the choice between work and leisure, the relevant consideration for individuals is the potential income they could either earn or forgo (Keane, 2011).

However, individual labour supply decisions are also influenced by taxes that are levied against income, including payroll taxes, capital gains taxes, and the taxes paid by small business owners and entrepreneurs. Income taxes change the relative value of engaging in work versus enjoying leisure by reducing the return from working, and thus artificially increase the value of leisure relative to working (Keane, 2011). In other words, income taxes make work less rewarding and leisure more rewarding. For this reason, income taxes are a source of major distortion and misallocation of resources within the Canadian economy.

A recent article in the Journal of Economic Literature by Michael Keane and Richard Rogerson (2012) reviewed influential contributions to the literature assessing the influence of income tax rates on people's desire to work (i.e., their labour supply). The authors begin by noting the differences and seeming inconsistencies between empirical estimates measuring the impact of tax rates on labour supply and then identify several factors that lead to the differences. First, the authors stress that the effect of

changing tax rates on weekly working hours depends on an assortment of factors including age, sex, geographic locale, educational attainment, and income bracket. They also explain how different estimation methods have led to divergent results. Estimates using individual-level data (data on a single person or family unit) tend to show a smaller effect of income taxes than estimates using aggregate data. Specifically, studies using individual-level data have estimated that a 10 percent increase in the after-tax wage rate can increase the amount of labour supplied by between 0.9 and 3 percent. Conversely, estimates based on aggregate data typically find higher magnitudes of responsiveness. A 10 percent increase in the after-tax wage rate leads to a 10 to 20 percent increase in aggregate labour supply. The authors also attribute some of the divergence to a misunderstanding about how workers comprehensively respond to changes in their after-tax wages. Workers not only adjust their labour supply, but may also adjust the amount of income they report when filing taxes, opt to receive a greater share of their compensation in the form of fringe benefits (or alternative financial compensation like executive stock options), or change their effort level and diligence while on the job. The authors conclude by explaining that divergent estimates based on individual versus aggregate-level data are a result of the ability of aggregate data to reflect broader responses to changes in after tax wages. The authors posit that the higher estimates using aggregate data better reflect the various ways individuals can respond to changes in after tax wages.

Another recent and comprehensive survey published by Michael Keane (2011) in the *Journal of Economic Literature* outlines and discusses many of the important findings, controversies, and empirical difficulties that have been addressed in the existing literature. Professor Keane begins by discussing some of various methodological approaches to gauging the impact of taxation on labour supply. He notes the distinctions between models that include savings and the acquisition of marketable skills ("human capital") and more basic models that exclude considerations related to savings and human capital. Keane then discusses the differential ways taxes affect the labour supply of men versus that of women. He finds a near consensus that the amount of labour supplied by males is not strongly influenced by changes in income taxes. More specifically, Keane notes that while most studies have found that the marginal income tax influences some men's decisions, particularly those with less education, about whether or not to engage in remunerated work—commonly referred to as labour force participation—it has a weaker influence on the amount of hours spent working once the decision to work has been taken.

Yale University economist Costas Meghir and his colleague David Phillips (2010) co-authored another insightful overview of the literature on labour supply and taxes. The authors highlight four fundamental ideas conveyed in the literature: (1) irrespective of educational attainment, changes in the marginal tax rate have little impact on the number of hours worked for men once they have opted to work; (2) for men with

lower levels of education, changes in the marginal tax rate influence the decision of whether or not to work, but have little influence on their reported income; (3) for men with higher levels of education, a change in the marginal tax rate does not affect whether or not they decide to work, but it does affect the amount of income disclosed to the tax authority; and (4) for both married and single women, changes in their marginal tax rate influence both the primary decision of whether or not to work, and the secondary decision of how much to work.

Nobel laureate Edward Prescott (2004) made a seminal contribution to the international research in this area. Prescott examined the role of marginal tax rates in accounting for changes in hours worked and employment income for the working age population (15 to 64 years) in G7 countries from 1970 to 1974 and 1993 to 1996. The author's main finding is that differences in marginal tax rates accounted for a large part of the differences in hours worked in the early 1970s and the early 1990s in the United States and several European countries. More specifically, from 1970 to 1974, the actual labour supply in the United States, measured in average working hours per week per person, was slightly below that of Germany and France and above that of Italy. After approximately two decades, the number of average hours worked per week in the United States surpassed the number of average weekly hours worked in both Germany and France, while the gap between the US and Italy expanded further (during the 1993 to 1996 period). More specifically, Americans worked nearly 34 percent *more* hours per week per person than Germans, 48 percent more than the French, and the 57 percent more than Italians. Prescott duly notes that relatively low labor supplies in Germany, France, and Italy are in part attributable to high marginal tax rates. Moreover, the entire gap between the amount of weekly working hours per person in the US on the one hand, and that of Germany and France on the other, is due to differences in the tax system, as opposed to variable labour market regulations and the differing generosity of unemployment benefits. As for the responsiveness of the US labor supply to changes in marginal tax rates, Professor Prescott estimates that a 1 percent increase in marginal tax rates will lower the number of hours worked per week per person by 3 percent.

An earlier study by Emanuela Cardia et al. (2003) arrived at a similar conclusion. They found that a 10 percentage point decrease in marginal tax rates increased the weekly hours worked by between 4.5 percent (in Germany) and 18.0 percent (in the United States). Weekly hours worked increased by 9.9 percent in Canada; the range in the United States was from 12.8 to 18.0 percent, depending on the period analyzed.

Following Prescott's (2004) lead in assessing differences in labour supply between the US and Europe, Dhont and Heylen (2008) studied 14 European countries and the US between 1995 and 2001, using OECD and national data on personal incomes, marginal tax rates, government spending as a percentage of the national economy (GDP), and net income transfers to explain the divergence in the number of

hours worked by Europeans compared to Americans. The authors posit that Americans work more, as is evidenced by higher average employment rates, because they face relatively low income tax rates and receive the lowest benefits for long-term unemployment. For Americans, low income taxes and modest long-term unemployment benefits make the benefits from working higher than in Europe, resulting in higher employment rates. The authors assert that the converse is true for many European countries. Furthermore, the authors also find that the extent to which government spending is productive, producing realizable benefits for workers, is also an important factor in explaining labour supply differences between the US and Europe, and within Europe itself. The authors suggest that productive government spending can raise employment rates, because workers associate taxation with higher quality and more abundant provision of public goods, and not with a reduction in their compensation from working.

Several studies examined tax reforms in the United States in the mid-1980s and 1990s to assess the impact of taxes on labour supply, including two influential papers by Harvard University economist Martin Feldstein (1995a, 1995b). In a study published in the *American Economic Review*, Feldstein (1995a) reviewed key literature on the impact of the Tax Reform Act of 1986 on labour supply in the United States. The consensus in the existing research was that men's working hours and participation rates were generally insensitive to net wages (after-tax wages) but that married women's working hours and participation rates were substantially more sensitive. Feldstein further noted that it was wrong to say that taxes did not affect the supply of men's labour since the amount of "labour" also depended on the intensity of work effort, the nature of the occupation, on-the-job acquisition of skills, and many other dimensions, all of which can be influenced by changes in tax rates (Feldstein, 1995b).

Most recently, Ziliak and Kniesner (2005) published a study in the *Journal of Political Economy* that used the US tax reforms of the 1980s and 1990s to examine the impact of income taxes on labour supply. Using data on male household heads from 1980 to 1999, the authors found that a 10 percent increase in net wages (after-tax wages) increased hours worked by 3 percent. The authors also estimated that the efficiency cost of an additional dollar of tax in the regimes prior to the reforms was 16 cents to 21 cents.

In a study published in the *Journal of Monetary Economics*, University of California at Los Angeles economist Lee Ohanian et al. (2008) analyze data for 21 OECD counties between 1956 and 2004 to assess if business cycles as well as income taxes were important in explaining variation in hours worked over time and across countries. The authors find that while business cycles failed to explain cross country differences in the number of hours worked, variations in national income tax rates and social benefits could account for most of the changes in hours worked between different countries over time. The authors also looked at unionization, labour regulations,

the power of collective bargaining, and the generosity of unemployment benefits to see if these factors also contributed to cross country differences in hours worked. The authors found that these factors were relatively insignificant compared to income taxes in explaining the variability of hours worked between countries over time.

In a more recent study, Blomquist and Selin (2010) used Swedish survey data between 1981 and 1991 to analyze the impact of marginal tax rates on hourly wages and labour income. The authors find that marginal tax rates can affect hourly wages; a 10 percent decrease in the marginal tax rate leads to a 1.4 to 1.6 percent increase in hourly wages for men and a 4.1 to 5.7 percent increase in hourly wages for women. Similarly, the authors find that a 10 percent decrease in the marginal tax rate results in a 1.9 to 2.1 percent increase in labour income for men and a 9.6 to 14.4 percent increase in labour income for women. As is the case for the hours worked, the above results show that women's hourly wages and labour income earned are more affected by (relatively sensitive to) changes in the marginal tax rate than men's.

The influence of marginal tax rates on the decision to report income

Much of the recent research looking at the effect of marginal tax rates on incentives has focused on a relatively new measure: the extent to which changes in marginal tax rates change the amount of taxable income that individuals report. This new measure is thought to capture a broader set of behaviours apart from adjustments in labour supply, including the propensity for tax avoidance and evasion, a shift toward receiving greater compensation in the form of fringe benefits or alternative financial rewards like executive stock options, and adjustments to effort and diligence while on the job (Giertz, 2010b; Saez et al., 2012; Keane and Rogerson, 2012). Harvard University economist Martin Feldstein (1995b) provided the first important analysis of behavioural responses to changes in tax rates that included adjusting reported income. Since then, a large and growing body of literature has focused on empirically estimating the impact of changes in marginal tax rates on reported taxable income.

In a recent article in the *Journal of Economic Literature*, University of California at Berkeley economist Emmanuel Saez et al. (2012) survey the growing body of research analyzing the responsiveness of taxable income to changes in the marginal tax rate. The authors discuss the difficulties in accurately estimating the responsiveness of taxable income to changes in marginal tax rates. To illustrate the empirical challenges, the authors use US tax return data between 1960 and 2006 and legislated changes in marginal tax rates to show that the responsiveness of reported income to changes in marginal tax rates can vary over time, across locales, and between income brackets. The authors then discuss the previous empirical estimates, positing that the

best available estimates suggest that a 10 percent increase in marginal tax rates can reduce taxable reported income by 1.2 to 4 percent. Estimates for higher income individuals are even larger, typically finding that a 10 increase in marginal tax rates can induce a reduction in reported taxable income in excess of 5 percent. The authors calculate that a 10 percent tax increase that reduces taxable reported income by 2.5 percent generated a social welfare loss equivalent to 19 cents per tax dollar collected for all taxpayers combined, and 39 cents per tax dollar collected for the top 1 percent of income earners. The authors point out that higher-income individuals typically have better opportunities to avoid taxes by using deductible expenses to reduce their reported income, and are accordingly more sensitive to changes in marginal tax rates. The authors affirm that tax-hike-induced reductions in reported income generate social loss, and suggest that the best policy initiatives aimed at abating social welfare losses include reducing opportunities for tax avoidance and widening the tax base.

University of California at Berkeley economists David Romer and Christina Romer (2012) look at the interwar period in the United States (1919 to 1941), to examine the incentive effects of changes in marginal income tax rates, a period during which the rates changed regularly and dramatically across income groups. A key feature of the interwar American tax system was that the burden of income taxes fell disproportionately on high-income people; the top 0.05 percent of income earners paid roughly 95 percent of total personal income taxes. Accordingly, the authors focus on the behavioural impact of taxes on individuals at the top of the income distribution. Their results show that during the interwar period, a 1 percent decrease in the marginal tax rate increased reported income by 0.2 percent. Furthermore, the authors found that a reduction in marginal rates increased business formation (i.e., the number of incorporations).

Several insightful contributions to the literature on the responsiveness of taxable income to changes in marginal tax rates have been made by University of Nebraska-Lincoln professor Seth H. Giertz (2008, 2010a, 2010b). Giertz (2008, 2010a) demonstrates that empirical estimates can vary widely, depending on the time period being analyzed and the precise methodology used to isolate for the effect of changes in marginal tax rates on reported taxable income. Giertz (2010a) used US tax return data to look specifically at changes in marginal tax rates in the 1990s; his initial estimates of the effect of a 10 percent increase in marginal tax rates vary from a 1.9 percent reduction in taxable income when looking at annual changes, to a 3.3 percent reduction when looking at changes over three-year intervals. The author then provides additional estimates after adding more precision to his methodology to control for independent trends in marginal tax rates: a 10 percent increase in marginal tax rates could induce a 4.3 percent reduction in reported taxable income in the short term, and between a 7.8 and 14.6 percent reduction in reported taxable income over longer periods of time.

Additionally, Giertz (2010b) reviews notable earlier contributions to research on reported taxable income, providing an extensive and clear background to key conceptual issues that have arisen in the literature, and proceeds to explain how methodologies have evolved in order to refine and add precision to empirical estimates. The author notes that estimates of the responsiveness of reported taxable income to changes in marginal tax rates are very sensitive to an array of factors and that the range of potential estimates is wide. Using 2005 US income return data, the author estimates that if a 10 percent increase in marginal tax rates reduces reported income by 2 percent, US federal income revenues would fall by $12.2 billion from 98.6 billion to 86.5 billion, state and payroll taxes would fall by $3.4 billion, and there is an excess social cost (the lost ouput from the inefficiency of taxes) that is equivalent to 18 cents for each tax dollar collected. Similarly, if a 10 percent increase in marginal tax rates reduces reported income by 8 percent, US federal income revenues would fall by $48.7 billion (from $98.6 billion to $49.9 billion), state and payroll taxes would fall by $13.6 billion, and there would be an excess social cost equivalent to $1.25 for each tax dollar collected. As for policy recommendations, Giertz calculates that lower estimates—like a 2 percent reduction in taxable income in response to a 10 percent increase in the marginal tax rate—suggest that tax revenue is maximized when the a top tax rate is 78 percent. However, higher estimates—like an 8 percent reduction in taxable income in response to a 10 percent increase in the marginal tax rate—suggest that tax revenue is maximized when the top tax rate is 41 percent.

While earlier research has typically analyzed US data, several studies have looked at Canadian data. A study by Sillama and Veall (2001) looked at Statistics Canada data for 1986 and 1989, the years straddling the 1987/88 tax reform that decreased the number of tax brackets from 11 to 4 and widened the income tax base. The authors find that a 10 percent increase in marginal tax rates reduces reported taxable income by 2.5 percent. Another study by Saez and Veall (2005) looked at Canadian data from 1920 until 2000 and used a different methodology that looks at the shares of aggregate national income being reported by different tax brackets. The authors' favoured estimate for the top 1 percent of Canadian income earners during the period between 1972 and 2000 is that a 10 percent increase the top marginal tax rate will reduce reported taxable income by 1.7 percent.

In a more recent study, analysts at the federal Department of Finance used Canada Revenue Agency data between 1994 and 2006 to calculate comprehensive measures of the marginal tax rates in Canada, and then proceeded to estimate the impact of changes in marginal tax rates on reported taxable income (Canada, Department of Finance, 2010). As has been the case in earlier studies, this study concluded that the responsiveness of reported taxable income to changes in the marginal tax rates is positively related to the tax bracket, i.e., individuals in higher tax brackets are more sensitive to changes in marginal tax rates when reporting their income. More specifically,

the authors found that a 10 percent increase in marginal tax rates would reduce reported taxable income by 2 percent for Canadians in the top 10 percent of tax filers, by 3 percent for those in the top 5 percent of tax filers, and by between 6.2 and 7.2 percent for Canadians in the top 1 percent of the taxable income distribution[2] (Canada, Department of Finance, 2010).

Marginal tax rates and savings

Marginal tax rates can also affect how much individuals contribute to tax-deferred savings accounts. Investing in Registered Retirement Savings Plans (RRSPs) in Canada or Individual Retirement Accounts (IRAs) in the United States reduces the portion of additional income subject to income tax, consequently making these vehicles attractive to individuals trying to lessen their tax burden. One important study by Kevin Milligan (2002) found that an increase of 10 percentage points in the marginal tax rate increased the probability of participation in tax-deferred accounts, specifically RRSPs, by 8 percent. Similarly, Eaton (2002) found that in the US a one-percentage point increase in marginal tax rates would increase the likelihood of participation in IRAs between 2 and 3 percent.

Several other studies corroborate these findings. Cherie O'Neil and Rodney Thompson (1987), using sample data from the Internal Revenue Agency for the period from 1979 to 1982, analyzed the influence of the Tax Reform Act of 1986 (TRA86) on IRAs. Their analysis concluded that the decision to contribute to an IRA depended on the individual's marginal tax rate, the presence of interest income, the filing status of the taxpayer, and geographic location. Results showed that both the MTR and presence of interest income had a significant and positive influence on the decision to participate in an IRA. Specific results regarding MTRs revealed that a decrease of one percentage point in the MTR was associated with a 0.5 to 1 percent decrease in the probability of participation. Similarly, David Joulfaian and David Richardson (2001)

2 The estimated range of 6.2 to 7.2 percent for Canadians in the top 1% of the taxable income distribution depends on the sample and method used to produce the estimate. Using income data for individual Canadians in the top 1 percent of the taxable income distribution that includes business owners, investors, and stock option holders produces the highest estimate of 7.2 percent. A truncated sample that excludes business owners, investors, and stock option holders, and focuses on *gross income* instead of *reported taxable income*, produces an estimate of 6.5 percent. The lowest value of 6.2 percent is derived by aggregating all of the individual-level income data by percentiles, and analyzing the responsiveness of aggregated income class (or percentile) to changes in the marginal tax rate over time. This latter methodology, looking at how changes in marginal tax rates affect reported taxable income by aggregated income classes or percentiles over time, as opposed to an analysis of disaggregated individuals in a single period, was pioneered by University of California at Berkeley economist Emmanuel Saez (2004).

found that higher MTRs tended to increase the probability of participation in tax-deferred retirement savings plans in the United States.

The influence of MTRs on the decision to become self-employed or engage in entrepreneurial activity

Rising interest in entrepreneurship has generally corresponded with heightened interest in how taxes might affect entrepreneurial decisions. Apart from labour supply decisions, extensive economic research has also found that changes in marginal tax rates also influence decisions pertaining to entrepreneurship and the choice of whether to engage in self-employment (Gentry and Hubbard, 2000; Cullen and Gordon, 2007; Pissarides and Weber, 1989; Bruce, 2002; Schultze and Bruce, 2004; Gurley-Calvez and Bruce, 2008). However, there is some debate about precisely how income taxes influence entrepreneurial behaviour.

A study by William Gentry and Glenn Hubbard (2000) used US data from 1979 to 1992 to analyze the impact of tax progressivity on the decision to become an entrepreneur (defined as self-employed). The authors found evidence that a more progressive tax structure reduced the probability of entering self-employment since, if tax rates are more progressive, entrepreneurs pay substantial taxes on profits earned, but save little through taxes reduced by writing off losses incurred. In other words, there is a tax on "success" that discourages entry.

Most recently, Julie Cullen and Roger Gordon (2007) analyzed the extent to which the tax system affects the amount of entrepreneurial risk-taking. The authors measured risk-taking as the business losses that occur when an entrepreneur's business has expenses that exceed revenues (on a yearly basis). Higher business losses indicate that entrepreneurs are taking more risks to bring new ideas (i.e., goods and services) to market. Using a sample of American personal income tax returns from 1964 to 1993, the authors found that taxes did influence entrepreneurial risk-taking, but their impact differed according to the type of tax. Overall, the authors estimated that a reduction in personal tax rates of 5 percentage points (in every income bracket) led to a 40 percent decrease in entrepreneurial risk-taking since lower personal tax rates reduce the amount of business loss entrepreneurs can deduct from taxable income. On the other hand, several tax changes increased entrepreneurial risk-taking. For instance, the authors found that a shift to a 20 percent flat tax increased entrepreneurial activity by 15 to 20 percent. Introducing a negative income tax, whereby any negative taxable income (which happens when permissible deductions and exemptions are larger than gross income) generates a tax refund, would have more than doubled the amount of entrepreneurial risk taking. Allowing people to deduct business losses on their personal income tax return would have increased entrepreneurial risk taking by 50 to 100 percent. A reduction in capital gains taxes would have also increased entrepreneurial risk-taking.

Schultze and Bruce (2004) reviewed a large number of studies that used assorted methodologies to study the impact of changes in tax rates on entrepreneurship and self-employment. Contrary to the intuition that higher taxes discourage entrepreneurial activity, the authors explain that the earlier studies often found that higher income tax rates (on labour income) tended to increase entrepreneurial activity and the level of self-employment. This seemingly peculiar result—that higher income taxes increase self-employment—was typically explained as a consequence of the more abundant opportunities that entrepreneurs and the self-employed have to avoid taxes. Unlike wage earners whose taxes are paid directly to the tax authority (CRA or IRS) by their employers, entrepreneurs and the self-employed report their own incomes to the tax authority. As such, increasing taxes on labour income increases the appeal of entrepreneurial activity and its associated opportunities to underreport taxable income. The authors note that many studies have linked self-employment with increased opportunities to reduce tax liabilities.

One influential study by Nobel laureate Christopher Pissarides and University of London economist Gugliemo Weber (1989) looked at above average expenditures on food expenses (specifically deductions) by self-employed individuals in the UK, based on the premise that self-employed individuals have more opportunities to hide income through above average expenditures on food-related deductions. Using above average food expenditures as a proxy for hidden income, professors Pissarides and Weber analyzed UK data for 1982 and found that the self-employed underreported their true taxable income by roughly 33 percent, and that underreported income by the self-employed was equivalent to 5.5 percent of the UK's economic output for that year (Pissarides and Weber, 1989).

Schultze (2000) looked at the effect of changes in marginal tax rates on the likelihood of self-employment in the United States and Canada. Using data for the period between 1983 and 1994, the author found that a 10 percent increase in marginal tax rates in a given year induced, for Canadian males, a 1.6 to 3 percent increase in the probability of being self-employed the following year, and a 2.1 to 3.7 percent increase in the probability of male self-employment in the US a year after the tax rate increase.

Extensive research has also looked at the impact of capital gains taxes on entrepreneurship. Massachusetts Institute of Technology economist James Poterba (1989) formulated a framework for analyzing the impact of capital gains taxes on entrepreneurship. According to Professor Poterba, potential entrepreneurs compared the remuneration that could be earned from employment at an existing business against the possible financial rewards from establishing a new business. Poterba reasoned that a large share of the payoff from entrepreneurship is realized in the form of a capital gain. As such, lowering capital gains taxes can increase the payoff and resultant profitability of engaging in entrepreneurial activity. Paul Gompers and Josh Lerner (1998) tested Poterba's conjecture about the impact of capital gains taxes on entrepreneur-

ship by analyzing the relation between the stock of venture capital and tax rates on capital gains from 1972 to 1994. Confirming Poterba's original results, Gompers and Lerner found that an increase of one percentage-point in the rate of capital gains tax was associated with a 3.8 percent reduction in venture capital funding.

Bruce and Mohsin (2006) examined the impact of personal income tax rates, capital gains taxes, and corporate income tax rates on self-employment rates (a proxy for entrepreneurship) in the United States. The authors found that reducing the capital gains tax rate by one percentage point induced an increase in self-employment rates from 0.11 to 0.15 percentage points.

Based on the idea that individuals are attracted to entrepreneurial activity when the relative tax treatment of self-employment becomes favourable compared to taxes on wages and salaries, Tami Gurley-Calvez and Donald Bruce (2008) used US tax return data from 1979 to 1990, covering over 200,000 tax returns and 6,000 tax filers, and showed that reducing marginal tax rates on wages and salaries reduces the duration of entrepreneurial activity. Meanwhile, reducing marginal tax rates on self-employment increases the duration of entrepreneurial activity. More specifically, Gurley-Calvez and Bruce find that a one percentage point increase in marginal tax rates on wages and salaries shortens the time spent pursuing entrepreneurial activity by 16.1 percent for single tax filers and 12.7 percent for married tax filers (who identify entrepreneurial activity/self-employment as their primary source of income). A one percentage point reduction in the marginal tax rate on entrepreneurial activity/self-employment increases the length of entrepreneurial activity/self-employment by 32.5 percent for single tax filers and 44.8 percent for married tax filers. Turning their attention to the decision of entrepreneurs to either initiate or cease their entrepreneurial activity, the authors find that a one percentage point decrease in the marginal tax rate on wages and salaries increases the probability that entrepreneurial activity will cease by 9.17 percent for single tax filers and 3.98 percent for married tax filers. Conversely, a one percentage point decrease in the marginal tax rate on entrepreneurship/self-employment income reduced the likelihood of desisting from entrepreneurship/self-employment by 17.32 percent for single tax filers and by 7.81 percent for married tax filers (Gurley-Calvez and Bruce, 2008).

The impact of taxation on human capital investment and education

Just as they do for investments in plant, equipment, or financial assets, individuals can also decide how much to invest in their own personal skill development. As with other investment decisions, taxes can influence how much individuals invest in their education. In a recent article in the *Canadian Journal of Economics*, Burbidge et al. (2012) look at Canadian data for 1997, 2000, and 2006 to estimate the effective tax and subsidy rates on human capital investment in post-secondary education, including bachelor's and graduate degrees, for both men and women. The authors take advantage of

the 2001 flattening of the federal personal income tax structure that significantly lowered the tax disincentive for investment in human capital, as well as increases in tax credits, rising tuition fees, and public spending cutbacks for post-secondary education. The results are broken down by gender, and provincial details are provided in the case of bachelor degrees. The authors find that net subsidies—subsidies minus taxes—increased by a small amount for college and bachelor degree level education. This occurred because the reductions in tax rates attributable to 2001 legislation (which "flattened" the tax code, reducing the jump in tax rates by bracket) exceeded the overall decreases in educational subsidies. However, upon further analysis, the authors found that the decline in tax rates was not larger than the decline in educational subsidies across all provinces, and for all educational levels and between genders, leading to an overall decline in net educational subsidies from 1.6 to 1.1 percent. Similarly, the authors also found that net subsidies declined from 6.6 to 3.4 percent for master's level education and from 30.6 to 27.5 percent for doctoral level education.

Summarizing the importance of marginal tax rates to decision-making and economic efficiency

There is ample evidence that tax rates — and in particular marginal tax rates — influence individual behaviour when it comes to working, investing, saving, and entrepreneurship. Furthermore, research has shown that high and increasing marginal taxes stunt economic growth, reduce personal income, lower reported incomes, curtail capital formation, reduce aggregate labour supply, and inhibit entrepreneurship. In sum, taxes can reduce economic growth by creating strong disincentives to hard work, savings, investment, and entrepreneurship.

III Federal and Provincial Personal Income Taxes in Canada

As the research review above demonstrates, both economic theory and empirical analysis indicate a strong relationship between the tax code and various measures of economic well-being. This section presents the structure of both federal and provincial personal income taxes in Canada. (Subsequent sections compare Canada and several US states, along with other advanced economies.) Before documenting the current structure of Canada's tax codes, it is important to note the *thresholds* at which tax rates apply.

Thresholds matter, too—not just tax rates

The top marginal rate for Canadian income taxes (whether federal, or federal and provincial combined) applies at a lower threshold than in many US states and other peer countries. Consequently, simply looking at the top statutory rates is misleading, as it gives a more optimistic portrayal of the Canadian income tax burden than actually exists.

To see the potential significance of the threshold, consider the following exaggerated hypothetical example: Suppose Country X has a flat income tax rate of 50 percent, whereas Country Y has *two* brackets, one with a 10 percent rate levied on incomes below $10 million annually, and the other a 55 percent rate levied on income above $10 million. A simple comparison of the "top income tax rate" between the two countries would lead one to believe that Country X clearly had the tax code more likely to promote growth—after all, 50 percent is lower than 55 percent.

However, once the differences in threshold are taken into account, the conclusion is not so obvious. If the vast majority of people in Country Y earn far less than $10 million annually, then for the types of decisions regarding work effort, business creation, etc., the economically relevant marginal rate is 10 percent, not 55 percent. This reasoning is not to deny the importance of the top rate, applicable to the highest earners—after all, these are the most productive people in Country Y, and they are the ones most likely to have great flexibility in structuring their activities because of tax considerations. Even so, the aggregate *macro* effects of these disincentives are likely to be small, because only a tiny fraction of the population in Country Y earns anywhere near $10 million and thus is in the top bracket.

As this exaggerated example demonstrates, a comprehensive comparison of tax structures will take into account the thresholds at which marginal rates apply. In addition to looking at absolute dollar thresholds, the paper also includes measures of the marginal tax rates applicable at various percentages of the average wage in a given country. The rest of this paper uses both techniques when comparing the Canadian income tax structure with that in several US states and with peer countries.

The structure of federal and provincial personal income tax rates in Canada

Canada has a federal structure, whereby the federal (central) government levies income taxes, as do the individual provincial governments. Prior to the tax reforms that were begun in 1998,[3] the provincial governments used to base their personal income tax rates (and thresholds) on federal rates. Specifically, the provincial personal income tax (PIT) rates were calculated as a percentage of the federal rates. Following the reforms, the provinces were free to apply both rates and thresholds at their discretion. Table 1 outlines the thresholds and marginal rates for personal income taxes at the federal level for 2012.

Table 1: Structure of Federal Personal Income Tax (PIT) in Canada, 2012

2012 Thresholds	Rates
$0 – $10,822	0.0%
$10,823 – $42,706	15.0%
$42,707 – $85,413	22.0%
$85,414 – $132,405	26.0%
$132,406 –	29.0%

Source: PricewaterhouseCoopers, 2012.

As Table 1 indicates, the Canadian federal PIT has four brackets along with a basic deduction on the first $10,822 in income (in 2012). The top federal PIT rate is 29.0 percent. This rate is relatively low among industrialized countries, but by itself is a

3 In 1998, there was a joint agreement between the federal and provincial governments to change the basis of the tax collection agreements from a tax-on-tax, to a tax-on-base. This change started in 2000 for some provinces (NS, NB, ON, MB and BC). The rest of provinces started this new system in 2001.

Table 2: Provincial Personal Income Tax Thresholds and Rates, 2012

British Columbia	
$0 - $11,354	0.00%
$11,355 - $37,012	5.06%
$37,013 - $74,027	7.70%
$74,028 - $84,992	10.50%
$84,993 - $103,204	12.29%
$103,205—	14.70%
Alberta	
$0 - $17,282	0.0%
$17,283—	10.0%
Saskatchewan	
$0 - $14,942	0.0%
$14,943 - $42,064	11.0%
$42,065 - $120,184	13.0%
$120,185—	15.0%
Manitoba	
$0 - $8,634	0.00%
$8,635 - $30,999	10.80%
$31,000 - $66,999	12.75%
$67,000—	17.40%
Ontario (includes surtax)	
$0 - $9,405	0.00%
$9,406 - $39,019	5.05%
$39,020 - $68,223	9.15%
$68,224 - $78,042	10.98%
$78,043 - $80,440	13.39%
$80,441 - $499,999	17.41%
$500,000—	18.97%
Quebec	
$0 - $10,925	0.00%
$10,926 - $40,099	16.00%
$40,100 - $80,199	20.00%
$80,200—	24.00%
New Brunswick	
$0 - $9,203	0.00%
$9,204 - $38,189	9.10%
$38,190 - $76,379	12.10%
$76,380 - $124,177	12.40%
$124,178—	14.30%
Nova Scotia	
$0 - $8,481	0.00%
$8,482 - $29,589	8.79%
$29,590 - $59,179	14.95%
$59,180 - $92,999	16.67%
$93,000 - $149,999	17.50%
$150,000—	21.00%
Prince Edward Island	
$0 - $7,708	0.00%
$7,709 - $31,983	9.80%
$31,984 - $63,968	13.80%
$63,969—	16.70%
Newfoundland & Labrador	
$0 - $8,237	0.00%
$8,238 - $32,892	7.70%
$32,893 - $65,784	12.50%
$65,785—	13.30%

Source: PricewaterhouseCoopers, 2012; calculations by authors.

misleading indicator of the burden of income taxation in Canada. Table 2 shows the structure of provincial income taxes, as of 2012.

Table 2 shows that income tax codes vary greatly among the provinces. Alberta's stands out as the simplest. It has a single marginal rate of 10.0 percent on all incomes of $17,283 and above. On the other hand, Nova Scotia has a deeply progressive income tax code with five brackets ranging from 8.79 to 21.0 percent. Alberta has the lowest top marginal income tax rate (10 percent), while Quebec has the highest (24 percent).

A note on the federal structure and tax competition among provinces

The distribution of taxation from income among levels of government in Canada is less tilted in favour of the federal (or "central") government than in other countries in its peer group. Compared to citizens in other peer countries, Canadians tend to pay a lower share of their total income taxes to the federal government, and a greater share to provincial governments.

Although the *combined* marginal federal and provincial income tax rates in Canada represent a drag on economic growth and a threat to the country's international competitiveness, the relative lightness of federal taxation, and the (implied) relative heaviness of provincial taxation, is actually desirable from the perspective of both economic efficiency and common-sense notions of equity. In other words, if one assumes a given total Canadian income tax burden, there are important reasons to favour that burden emanating more from the provincial governments than the federal government.

With a relatively light federal taxation burden, Canadians are free to "vote with their feet" and move among the provinces, seeking out those with the best mix of taxation and government services. Canadians who desire greater expenditures on public services can seek out those provinces that offer them, though of course to some extent they will need to pay higher taxes to finance those expenditures.[4] Conversely, those who would rather have a light tax burden and are willing to live with a reduced "safety net" and fewer other government programs, at least have the option of moving to a province offering something closer to their ideal.

It's true that there are some government services—military defense being the obvious example—that are arguably more efficiently provided at the federal level, and that is the (economic) justification for having a federal government, and its associated taxation, at all. But as more and more services are provided at the federal level, requiring a concomitantly higher level of federal taxation applied to everyone, it becomes harder for Canadians to sort themselves according to their preferences for market- versus government-provided services. When government services (and the associated taxation) are performed at the federal level, it imposes a one-size-fits-all approach on all citizens. Furthermore, because emigration from the country is more onerous than simply moving among provinces, the check of what economists call Tiebout competi-

4 The imposition of higher costs for more government services is mitigated in Canada to some extent due to the presence of equalization, which transfers resources through the federal government to "poorer" provinces in order to ensure "comparable" levels of public services across the country. For a general overview and assessment of Canada's equalization system, please see Clemens and Veldhuis (2007).

tion (Tiebout, 1956)—voting with one's feet—is weaker, leading to higher overall levels of taxation.

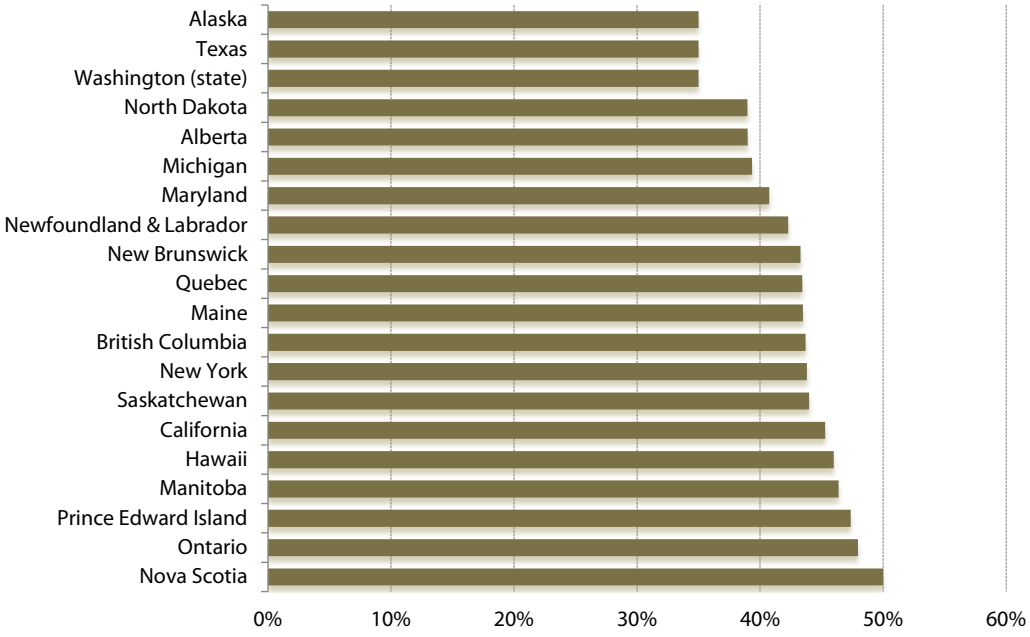
In summary, the combined federal and provincial income tax burden in Canada is too high, but the fact that Canada has a relatively higher provincial (or "sub-central government") burden compared to its peers is not necessarily a drawback. The important message is merely that it is necessary to look at the combined federal and provincial rates to understand Canada's actual standing against other countries.[5]

5 Since Quebec opted out of the programs under the Federal-Provincial Arrangement Act, Quebec residents file separate federal and provincial personal income tax returns. To adjust for this arrangement, Quebecers effectively pay lower federal tax rates than other Canadians, which is partly compensated for by higher personal income tax rates in Quebec. In order to compare tax rates provincially while incorporating the effects of the abatement, the federal rates that apply in Quebec were reduced by 16.5 percent. In other words, Quebec's combined federal and provincial rates have been adjusted for the abatement.

IV Canadian Income Taxation versus Taxation in Several US States

When seeking to compare the levels of Canadian income taxation to those in other jurisdictions, the obvious first place to look is the United States. In 2012, the top federal income tax rate in the United States was 35 percent, compared to Canada's 29 percent. On these bare facts, Canada seems quite competitive with the United States. However, once two important adjustments are made, the picture becomes much more nuanced. The first adjustment is to look at the top combined federal and provincial/state rates for the provinces versus select US states. The second adjustment is to consider the income thresholds at which the tax brackets apply, which in Canadian are typically lower than in the United States. As shown below, with each adjustment, the Canadian tax picture becomes more unfavourable.

Figure 1: Combined Federal and Provincial/State Top Personal Income Tax Rates for Canada and Select US States, 2012



Sources: PricewaterhouseCoopers (2012); calculations by authors.

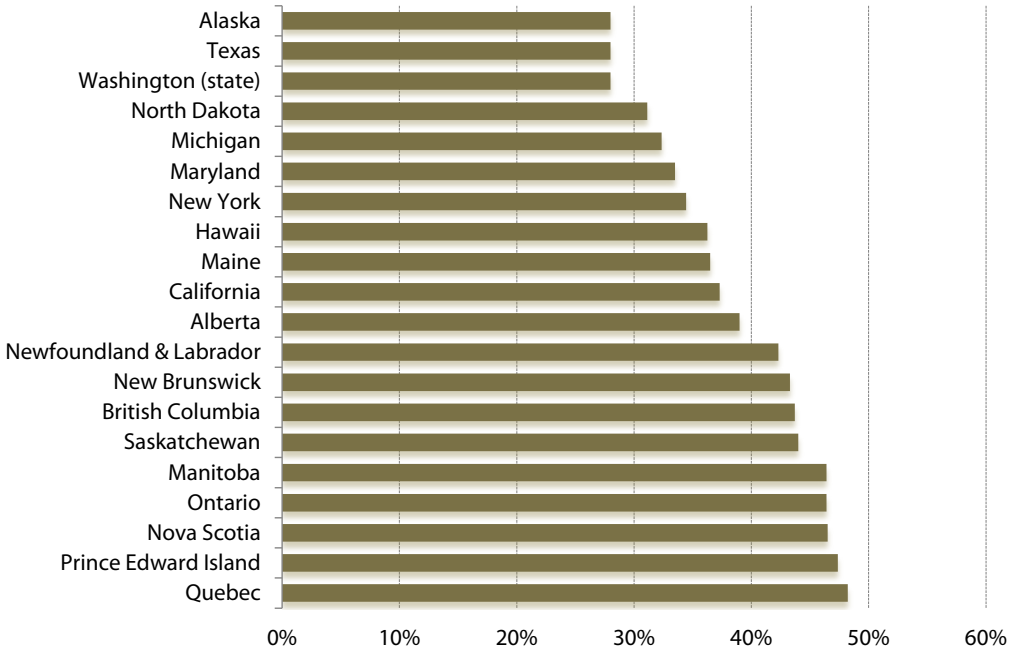
Total top income tax rates in Canada vs. select US states

Figure 1 compares the top combined federal and provincial income tax rates in Canada, versus the top combined federal and state income tax rates for several US states that are relevant to Canadian competitiveness.

Figure 1 illustrates that once provincial and state personal income tax rates are accounted for in addition to federal rates, Canada is no longer as attractive as the federal comparisons alone would have indicated. Even though Hawaii, California, and New York are among the highest-taxed US states, they compare favourably with several provinces, including (most notably) Ontario. Needless to say, on the other end of the spectrum, Texas, Alaska, and Washington State—with *no* additional levies on income—stand out very well compared to the Canadian provinces.

Yet things get worse for Canada. Once an adjustment is made for the fact that Canadian personal income tax rates take effect at relatively lower thresholds than do the US personal income tax rates, the comparison becomes completely lopsided. Figure 2 shows the combined federal and provincial or state marginal PIT (personal income tax) rate at the equivalent of CA$132,406—the threshold for the top federal PIT rate in 2012 for Canada. On this criterion, there *is* no comparison:

Figure 2: Combined Federal and Provincial/State Marginal Personal Income Tax Rates for CA$132,406, 2012



Source: PricewaterhouseCoopers, 2012.

As figure 2 indicates, once Canada's relatively low PIT thresholds are accounted for (at both the federal and provincial levels), *every* province has a higher marginal PIT rate (at the level of income at which Canada's top federal rate applies) than the benchmark US states, including Hawaii, which has the highest PIT rate among the US states. Figure 2 underscores the importance of looking not just at the top *federal* tax rate—according to which Canada is peerless among the G7 and Australia—but also including *provincial* taxes and accounting for the relatively low thresholds in Canada's graduated tax code.

The analysis in the next section broadens and compares Canada to other advanced economies.

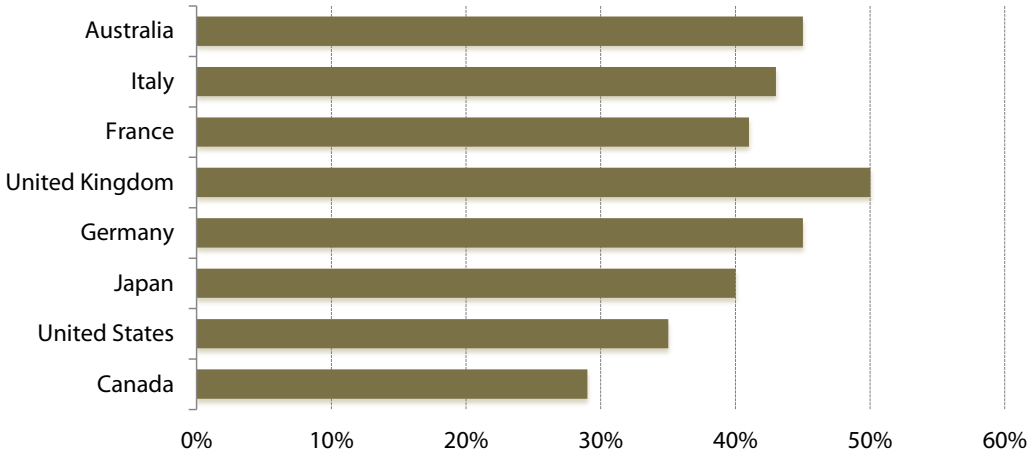
V Canadian Income Taxation versus that of Other Advanced Economies

In Section IV, the Canada/US comparison first looked very favourable for Canada when the focus was on only federal rates, but when provincial/state income taxes were added, the comparison was less encouraging, and less still once adjustments were made for Canada's relatively lower tax thresholds. The same pattern plays out when Canada is compared with selected other advanced economies—specifically, the other members of the G7 and Australia.

An initial, naïve comparison of only the top federal/central government PIT rates across other advanced economies seems to indicate that Canada has a very light tax burden (figure 3).

Figure 3 indicates that among the G7 countries plus Australia, Canada has the lowest top personal income tax rate at the federal/central level, so Canada seems to compare favourably with other advanced economies. However, figure 3 is misleading because the top marginal rates apply at different thresholds across the various countries. Canada's top rate, though the lowest in this group, kicks in at a relatively low level of income.

Figure 3: Federal/Central Top Personal Income Tax Rates for Selected Countries, 2011



Source: OECD tax database at:
http://www.oecd.org/tax/taxpolicyanalysis/oecdtaxdatabase.htm#pir.

Table 3: Marginal Federal/Central Personal Income Tax Rate Applicable at Equivalent of Canada's Top Rate, 2011

Country	Domestic Currency Equivalent to CA$128,800 (June 2011)	Personal Income Tax Rate in 2011 at this Income	Difference from Top Personal Income Tax Rate
Canada	128,800	29.0%	0%
United States	131,886	28.0%	-7%
Japan	10,607,061	33.0%	-7%
Germany	91,569	45.0%	0%
United Kingdom	81,316	40.0%	-10%
France	91,569	41.0%	0%
Italy	91,569	43.0%	0%
Australia	124,222	37.0%	-8%

Sources: OECD Tax Database, http://www.oecd.org/tax/taxpolicyanalysis/oecdtaxdatabase.htm#pir; and St. Louis Federal Reserve exchange rate series http://research.stlouisfed.org/fred2/categories/15.

To correct for this discrepancy, table 3 shows the relevant marginal personal income tax rate among the same countries at the equivalent level of income to which Canada's top rate applies.

As table 3 shows, once a correction is made for the relatively low threshold of Canada's top PIT rate, its superiority begins to wane. In table 3, it is the *United States* that has the lowest marginal PIT rate (at 28 percent), while Japan is only four percentage points higher than Canada at 33 percent.[6] Australia and the United Kingdom also have much more competitive PIT rates, if we look at the equivalent income at which Canada's top rate applies.

To be sure, table 3 is not the definitive word, any more than is figure 3. Economic theory suggests that the *top* marginal rate really is important, because that marginal rate is applicable to the highest income earners who presumably have the ability to

6 We note that the US figure of 28 percent in table 3 is for a single person. The United States tax code applies a higher tax rate to a married couple (both of whom earn income) than to two single individuals earning the same respective incomes. For married couples in certain income ranges, then, the advantage depicted in table 3 of the US vis-à-vis Canada might not hold.

Table 4: Marginal Combined Central and Sub-Central Tax Rates on Labor Income at Various Wage Levels, 2011

Country	Combined Marginal Tax Rate at…		
	100% of the average wage	133% of the average wage	167% of the average wage
Canada	30.2%	31.1%	35.4%
United States	31.7%	31.7%	31.7%
Japan	13.3%	20.0%	25.4%
Germany	31.7%	41.4%	44.3%
United Kingdom	20.0%	40.0%	40.0%
France	18.2%	30.1%	30.1%
Italy	29.9%	39.8%	39.3%
Australia	31.5%	38.5%	38.5%

Source: OECD Table I.4 at: http://www.oecd.org/tax/taxpolicyanalysis/Table%20I.4_FINAL.xls

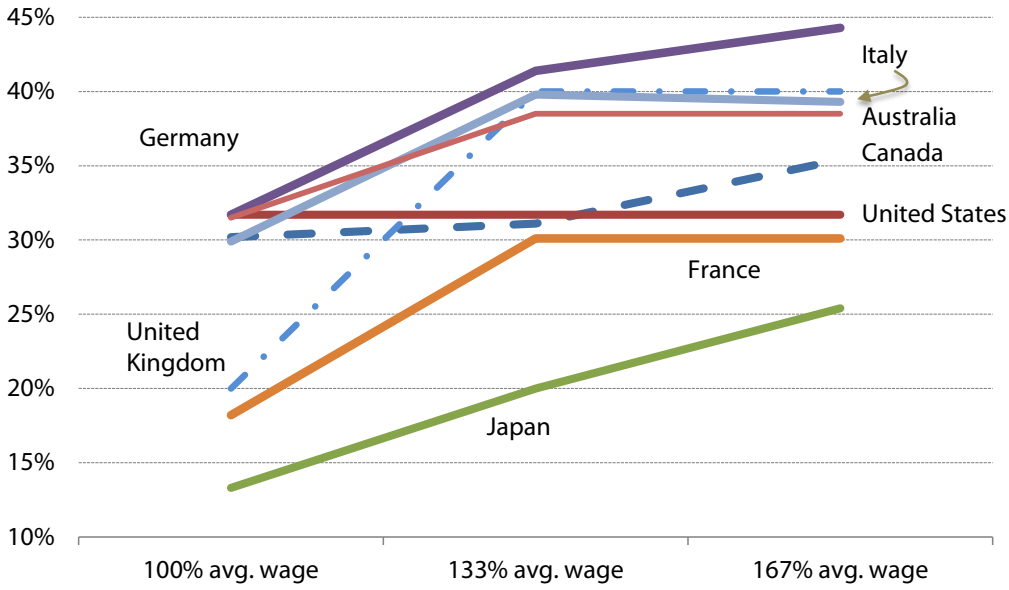
generate the most investment, job creation, and so on.[7] Nonetheless, together, figure 3 (showing the top PIT rates) and table 3 (showing the rates corrected for Canada's low threshold) provide a more balanced depiction of the true situation. Canada's federal PIT structure is still quite good compared to its peers, but not as good as a naïve look at the top rates would suggest.

Unfortunately, the analysis is further complicated. Individuals and businesses do not face only federal or central government income taxes, but of course must also pay provincial or state income taxes. A correction for this fact also reduces the apparent superiority of the Canadian tax environment. Because some of its provinces have relatively high marginal rates, and relatively low thresholds at which they apply, the full picture of the personal income tax in Canada suggests that reforms are needed if the country is to remain competitive.

Table 4 relies on OECD data to compare the marginal income tax rates of Canada with those of other advanced economies (including federal/central and provincial/sub-central governments) on gross labour income, at various multiples of each country's average wage. Figure 4 presents the same data in a chart.

7 This observation is particularly relevant for Canada, because the federal and provincial top marginal income tax rates kick in at such relatively low thresholds.

Figure 4: Marginal Combined Central and Sub-Central Tax Rates on Labour Income at Various Wage Levels, 2011



Source: OECD Table I.4 at: http://www.oecd.org/tax/taxpolicyanalysis/Table%20I.4_FINAL.xls

As table 4 and figure 4 illustrate, with the inclusion of sub-central governments and accounting for bracket thresholds, Canada falls into the middle of the pack of the G7 countries (plus Australia). For example, at 167 percent of the average wage, the combined marginal PIT in Canada is 3.7 percentage points higher than in the United States, 5.3 percentage points higher than in France, and a whopping 10 percentage points higher than in Japan.

VI Beyond Tax Rates and Thresholds: Clawbacks and Tax Credits Affect Incentives at the Margin

Economic theory, the empirical literature, and plain common sense suggest that high marginal income tax rates discourage income-generating activity which, for most people, means working at a conventional job. What is not so obvious is the perverse effect that many ostensibly anti-poverty programs can have on work effort, at the margin. In particular, "clawbacks" and tax credits can actually amplify the effective marginal tax rate that lower-income individuals face in certain income ranges. Ironically, this reduces upward economic mobility, ossifying the social structure and making it harder to escape from low income.

For example, current federal policy imposes a 15 percent clawback on Old Age Security (OAS) payments after individual income reaches $69,562 (as of 2012). The OAS benefit is fully clawed back at income of $112,966 (Service Canada, 2012). For individuals who know they will well exceed this threshold in their later years, this feature of the OAS is irrelevant; they will not change their work or savings behaviour in their prime years because of the clawback. However, for individuals whose income during their retirement years *will* fall in the vicinity of this threshold, the clawback is quite substantial. Consider: In 2012, someone living in British Columbia earning $75,000 would face not only a federal marginal personal income tax rate of 22 percent, plus a provincial marginal personal income tax rate of 10.5 percent, but also a 15 percent clawback rate on his OAS benefits, resulting in a real marginal tax rate of 47.5 percent. The disincentive effects of marginal tax rates are particularly pronounced for older workers, who are eventually going to retire but must decide on the margin *when* to retire. A real marginal tax rate of 47.5 percent is quite a wedge between effort and reward, a wedge that could cost Canada a significant amount of lost working hours from the older demographic.

Tax credits that "phase out" over a certain income range have a similar effect. Other examples include low-income seniors and welfare recipients losing eligibility for drug and dental benefits. All of these programs interact in such a way that the net increase in the standard of living may not be very much for a person currently on welfare who is considering taking a full-time (but low-paying) job. Realistically, the only long-term escape from low income and dependence on government aid is for such a person to take an initially low-paying job, in order to gain work experience and better skills, which in turn will allow the motivated individual to achieve promotions and wage increases in the future. Yet the very first rung on this ladder is artificially raised by government aid programs that are means-tested.

VII Conclusions & Recommendations

An extensive theoretical and empirical literature shows the harmful effects of high and progressive income tax codes. Although Canada's top federal personal income tax rate is quite competitive compared to the rest of the G7 countries and Australia, this superficial ranking can be deceiving. After adjusting for provincial income tax rates—which are relatively high compared to other subnational units—and further adjusting for the relatively low income thresholds at which the Canadian rates apply, the picture becomes very different.

To take but one striking illustration: Looking at the combined federal and provincial/state personal income tax rate in 2012 applicable to an individual making CA$132,406, *every Canadian province* has a higher level than do seven relevant US states, including the relatively highly taxed New York State and California. Because of the proximity of this peer group of states, the disparity in total income tax rates might, in the aggregate, cause the provinces to have difficulty attracting highly skilled workers and new businesses.

The most obvious solution to the relatively high total tax burden is to institute income tax reform, particularly at the provincial level, and especially in Quebec and Ontario. These two provinces suffer from the worst of both worlds: They have extremely high top marginal rates, *and* their tax codes are very progressive. If one were to design a tax structure that would repel new businesses and highly skilled individuals, and that would hinder the development of resources already within the jurisdiction, the current systems applicable in Quebec and Ontario would be good models to follow.

The principles for income tax reform are straightforward: The objective should be to flatten rates and broaden the tax base (by reducing or eliminating tax credits, deductions, etc.). In principle, the two adjustments could be done in such a way as to offset each other, leading to a "revenue neutral" reform, but for maximum effectiveness, there is no reason to insist that the federal or provincial governments extract the same total revenue in the short run. An explicit tax cut would promote investment, job creation, and economic growth more effectively than a mere revenue-neutral restructuring.

Since its bold spending cuts and later tax relief of the mid- and late-1990s, Canada's federal government has been a model of fiscal prudence and discipline to the rest of the world. If only the provincial governments would follow suit with comparable reforms, Canada would be in an excellent position to attract capital and skilled workers from around the world, and would take full advantage of its own domestic resources and labour force.

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