FINANCES OF THE NATION TAXING WAGES IN CANADA, 2001-2018

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The "Finances of the Nation" feature presents annual surveys of provincial and territorial budgets and data-driven analyses of taxation and public expenditures in Canada. This series is a successor to the annual monograph titled Finances of the Nation (and, previously, The National Finances), published from 1954 to 2013 by the Canadian Tax Foundation.

The key data sets prepared for the Finances of the Nation project are available for download at https://financesofthenation.ca.

In this article, Ken McKenzie presents calculations of the tax burden based on average wages in Canada's provinces and territories, using the methodology adopted by the Organisation for Economic Co-operation and Development in its Taxing Wages publication.

KEYWORDS: WAGES ■ TAXATION ■ TAX BURDEN ■ CANADA ■ OECD ■ COMPARATIVE ANALYSIS

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INTRODUCTION

What is the tax burden on an average wage earner in Canadian provinces and territories? How does that burden vary across provinces and territories? How does it vary by family type? How does it compare with the tax burden in other countries? The purpose of this article is to present calculations of various tax burden metrics that address these questions.

Every year the Organisation for Economic Co-operation and Development (OECD) releases a publication called *Taxing Wages*. The data presented in this publication provide information on the income tax paid by workers on their wages, the social security contributions paid by both employees and employers, and some of the family benefits paid out as cash transfers in each country. The publication reports

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¹ Organisation for Economic Co-operation and Development, Taxing Wages 2019 (Paris: OECD, 2019) (https://doi.org/10.1787/tax_wages-2019-en).

various marginal and average effective tax burden metrics for different household types, such one- and two-earner families at different income levels, and with and without children.

The *Taxing Wages* publication is a widely used data source that enables a comparison of the effective tax burdens on wages across countries. Both central and subnational taxes and benefit programs are included in the effective tax burden calculations; however, the calculations are based on a "representative" subnational jurisdiction for each country. This is typically the largest subnational jurisdiction; in Canada, this is Ontario. While this is a reasonable approach when dealing with 36 OECD countries, it can be misleading when taxes and average earnings vary across subnational jurisdictions, as is the case for Canadian provinces and territories.

In this article, I present comparable calculations using the *Taxing Wages* methodology for each of Canada's 13 provinces/territories. Calculations are presented for the years 2001-2018. This enables a comparison of the effective tax burden on wages across all provinces/territories, in relation to each other and also to other countries.²

As discussed in more detail below, the approach followed in this article differs in an important way from an alternative approach to comparing tax burdens across jurisdictions. Under the alternative approach, the tax burden is determined for the same income levels in each jurisdiction, and differences in tax burdens arise solely because of differences in the underlying tax/benefit system. That is not the approach taken here. Rather, I follow the OECD methodology and calculate various tax burden metrics based on the average earnings from wages in each province/territory, which differ across jurisdictions. Thus, the tax burden metrics can vary across provinces/territories not only because of differences in the underlying tax/benefit systems, but also because of differences in average earnings.

The results are interesting and in some cases differ significantly from the approach of using the same income levels in all provinces/territories for comparison purposes. For example, the tax burden on an average taxpayer is higher in Alberta than in British Columbia, Saskatchewan, and Ontario, in large part because average wages are higher in Alberta. Also, from an international perspective, Canadian provinces/territories emerge as being relatively low-tax jurisdictions, especially for married couples with children.

METHODOLOGY

As indicated above, an important feature of the OECD's approach to measuring effective tax burdens is the reference income levels used to calculate the effective tax burden in each jurisdiction. Notably, the OECD uses the average earner in each

² As indicated in the headnote at the beginning of this article, the analysis presented here is part of a broader data-driven project. The intention is to periodically update and maintain the "Taxing Wages in Canada" data set over time. This article presents only some of the effective tax burden calculations, for illustrative purposes; a more extensive set of data can be found at https://financesofthenation.ca.

jurisdiction as the base case.³ As a result, tax burdens may differ across jurisdictions not only because of differences in tax and benefit rates, but also because of differences in average earnings. Thus, one jurisdiction (A) may have a lower tax burden than another jurisdiction (B) for the same income levels, but the effective tax burden in A could be higher than the tax burden in B because average earnings in A are higher. The idea behind the OECD's approach is therefore to calculate the effective tax burden for the base case of the average wage earner in each jurisdiction, which will differ across jurisdictions, and then to modify the base case for other income and family circumstances.

As noted above, this approach to calculating tax burdens differs from what is perhaps a more common approach, which computes tax burdens across provinces/ territories for the same levels of income. The two approaches address different questions. The standard approach focuses exclusively on the underlying structure of the tax/benefit system and ignores local labour market conditions, which manifest themselves in higher or lower wages and/or the cost of living. The approach taken here is to compare tax burdens across average wage earners, taking local labour market conditions into account. The two approaches thus address different questions. They can be thought of as reflecting different views on the extent to which higher wages are capitalized into higher costs and prices, and the mobility of labour across provinces/territories.

The OECD's *Taxing Wages* data set presents average and marginal effective tax burden metrics for the following eight household types:

- 1. single individual earning 100 percent of average provincial earnings;
- 2. single individual earning 67 percent of the average provincial earnings;
- 3. single individual earning 167 percent of average provincial earnings;
- 4. single individual earning 67 percent of average provincial earnings, two children:⁴
- 5. married couple, principal earner earning 100 percent of average provincial earnings, no spouse earnings, no children;
- 6. married couple, principal earner earning 100 percent of average provincial earnings, spouse earning 33 percent of average earnings, two children;
- 7. married couple, principal earner earning 100 percent of average provincial earnings, spouse earning 67 percent of average earnings, two children;

³ Consistent with the OECD's approach, I calculate average provincial earnings as average weekly hours × average hourly wages × 52, for sectors B-N in the United Nations, International Standard Industrial Classification of All Economic Activities: Revision 4 (New York: United Nations, Department of Economic and Social Affairs, Statistical Division, 2008). Average hourly wages are from Statistics Canada table 14-10-0063-01, "Employee Wages by Industry, Monthly, Unadjusted for Seasonality." Average weekly hours are from Statistics Canada table 14-10-0034-01, "Usual Hours Worked by Industry, Monthly, Unadjusted for Seasonality."

⁴ In the scenarios with two children, both children are assumed to be under six years of age.

8. married couple, principal earner earning 100 percent of average provincial earnings, spouse earning 33 percent of average earnings, no children.

Taxing Wages calculates several average and marginal effective tax burden metrics. All of the average effective tax burden metrics are expressed relative to gross earnings, which consist of personal earnings from wages plus employer social security contributions, which in Canada consist of employer-paid Canada Pension Plan/Quebec Pension Plan (CPP/QPP) contributions and employment insurance (EI) premiums. ⁵ Cash benefits include programs such as the Canada workers benefit (CWB) and the Canada child benefit (CCB), and their provincial counterparts.

There are five average tax burden metrics:

- 1. Average total tax wedge (ATTW): Personal income tax (PIT) + Employee and employer CPP/QPP and EI premiums Cash benefits
- 2. Average personal tax rate (APTR): PIT + Employee CPP/QPP and EI premiums
- 3. Average net personal tax rate (ANPTR): PIT + Employee CPP/QPP and EI premiums Cash benefits
- 4. Average personal income tax rate (APITR): PIT
- 5. Average employee social security rate (ASSR): Employee CPP/QPP and EI premiums

There are two marginal effective tax burden metrics, which calculate the incremental tax arising from a small increase in the earnings of the principal earner:

- 1. Marginal total tax wedge (MTTW), which uses the taxes and benefits in the ATTW measure
- 2. Marginal net personal tax rate (MNPTR), which uses the taxes and benefits in the ANPTR measure

The tax burdens are calculated using the Canadian Tax and Credit Simulator (CTaCs), developed by Milligan.⁶ Seven tax burden metrics applied to eight family types for 13 provinces/territories gives rise to 728 tax burden metrics for each year from 2001 to 2018. This data set is clearly too large to include in this feature. In the

⁵ There is an issue as to whether CPP/QPP contributions should be included in tax burden measures, either as a tax or as part of gross earnings. This comes down to the question of whether such contributions are a tax or a benefit analogous to private insurance. I follow the OECD's approach so as to maintain comparability with its calculations. Of course, my inclusion of CPP/QPP contributions does not affect interprovincial comparisons, since these contributions are the same across provinces, but it does affect the overall level of the tax burdens reported.

⁶ Kevin Milligan, "Canadian Tax and Credit Simulator: CTaCS," version 2019-1 (http://faculty.arts.ubc.ca/kmilligan/ctacs/). Any errors are mine alone.

next section, I present and discuss some selected results. The entire data set can be accessed at the Finances of the Nation data portal.⁷

SELECTED RESULTS

I focus on the average total tax wedge (ATTW) and its marginal counterpart, the marginal total tax wedge (MTTW), because they are the broadest measures of the tax burden and include cash benefits. I emphasize again that differences in the effective tax burden can occur because of differences in tax/benefit rates across provinces and territories, and differences in average earnings, and that both metrics include both employee and employer contributions to CPP/QPP and EI.

Figure 1 presents the ATTW for a single earner for various levels of income in 2018 by province/territory. Immediately evident is the fact that for a single individual with two children earning 67 percent of average earnings (the 67-2 scenario), the ATTW is negative, and substantially so in some provinces/territories. This is because the cash benefits, in particular the CWB and the CCB, exceed total income and social security taxes paid in this case. The ATTW for this scenario is lowest in Quebec, at almost -40 percent, and highest in the Northwest Territories, at -9 percent. For single lower income earners with no children (ATTW 67), British Columbia has the lowest ATTW, at 21 percent, while Manitoba has the highest, at 25 percent. For average earners (ATTW 100), Nunavut has the lowest ATTW, at 24 percent, followed by the Northwest Territories at 26 percent, and British Columbia and Newfoundland and Labrador at 27 percent; Quebec has the highest rate, at 31 percent. For high earners (ATTW 167), the lowest rate is in Nunavut and in Newfoundland and Labrador, at 27 percent, with Quebec again having the highest rate, at 34 percent. As indicated above, these results differ from what we might expect using the same income levels across provinces and territories. Calculations based on this approach typically find that Alberta has a low tax burden on wages for lower- and higher-income individuals.8 As discussed above, because average earnings are higher in Alberta than in other provinces, the tax burden on the average Albertan is higher owing to the progressivity of the tax system.

Figure 2 presents the ATTW for various married couple scenarios. In all cases, there are two children and the principal earner earns the provincial/territorial average wage. Three scenarios are presented for spousal earnings: zero earnings (ATTW 0), 33 percent of average earnings (ATTW 33), and 67 percent of average earnings (ATTW 67). Again, the importance of the CCB is evident: we observe very low (close to zero and in some cases slightly negative) ATTWs in the zero spousal earnings scenario in many provinces. Again, the higher rates for this scenario in Alberta, and also in the territories, reflect higher average earnings. For a married

⁷ See supra note 2.

⁸ See, for example, Kenneth McKenzie, "Altering the Tax Mix in Alberta" (2019) 12:25 SPP Research Papers [University of Calgary, School of Public Policy] 1-40.

40
30
20
10
-20
-30
-40
-50

ATTW 67-2

ATTW 100

ATTW 167

FIGURE 1 Average Total Tax Wedge (ATTW), Single Individual, Various Earnings, 2018

ATTW 67-2 = single, two children, 67 percent of average earnings; ATTW 67 = single (no children), 67 percent of average earnings; ATTW 100 = single, average earnings; ATTW 167 = single, 167 percent of average earnings.

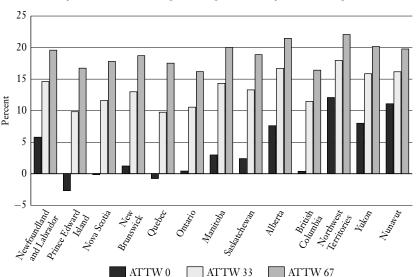


FIGURE 2 Average Total Tax Wedge (ATTW), Married Couple with Two Children, Principal Earner with Average Earnings, Various Spousal Earnings, 2018

ATTW 0 = spouse with no earnings; ATTW 33 = spouse with 33 percent of average earnings; ATTW 67 = spouse with 67 percent of average earnings.

couple with two children and a spouse earning 67 percent of the average wage, British Columbia and Ontario have the lowest ATTW, at 16 percent, while the highest rates are in Alberta and the Northwest Territories, at 21 percent and 22 percent respectively.

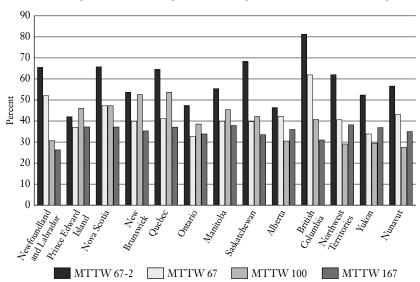
Figures 3 and 4 present the MTTW for, respectively, the single and the married couple scenarios. The marginal burdens measure the increase in taxes paid associated with a \$100 increase in the income of the principal earner, divided by \$100. Looking at figure 3 for single taxpayers, perhaps most striking is the fact that the MTTW is much higher for lower income earners (67 percent of the average) with children than for average and higher income earners. The rate for a single lower income earner with two children (MTTW 67-2) ranges from a low of 42 percent in Prince Edward Island to a high of 81 percent in British Columbia. It is important to emphasize again that reference average earnings in each province vary and that the MTTW includes employee and employer CPP/QPP and EI contributions. In this connection, lower income earners will pay CPP/QPP and EI premiums on incremental earnings because they are below the upper thresholds for these payments, unlike higher income earners, who are above the thresholds. Finally, and importantly, the calculations also reflect the clawback of the CWB and CCB. All of this combines to generate an MTTW that is very high for low income earners. For single average earners with no children (MTTW 67), the rate ranges from a low of 28 percent in Nunavut, followed by 30 percent in the Yukon and 31 percent in Alberta and in Newfoundland and Labrador, to a high of 54 percent in Quebec. For higher income earners (MTTW 167), the rate ranges from a low of 26 percent in Newfoundland and Labrador to a high of 38 percent in Manitoba and the Northwest Territories. Figure 4 for married couples shows similar patterns, with quite high MTTWs for married couples with a single average earner, again reflecting the CWB and CCB clawbacks.

The emphasis so far has been on comparing tax burdens across provinces and territories in 2018. Also of interest is the evolution of the tax burden over time. Figure 5 presents the ATTW for the provinces and territories for an average single individual with no children for 2001 through 2018. The calculations for the other income levels and family types (and other effective tax burden metrics) are available at the data portal.

Finally, because I follow the *Taxing Wages* methodology, it is interesting to consider the tax burden on wages in Canada in comparison with that of other OECD countries. As indicated above, the approach in the OECD publication is to use a representative subnational jurisdiction (Ontario in the case of Canada). Figure 6 shows the ATTW for Canadian provinces and territories and selected OECD countries for single and married average earners (the latter assuming two children and a

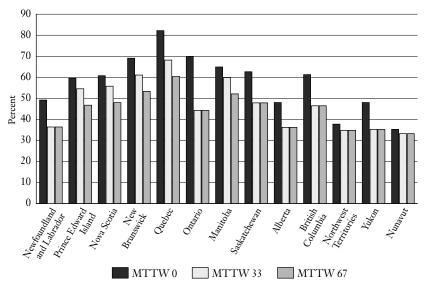
⁹ My effective tax burden calculations for Ontario are lower than the reported OECD calculations. I have not been able to ascertain precisely why this is the case; however, I suspect it is because the OECD seems to overstate the tax burden owing to the employer share of social security contributions.

FIGURE 3 Marginal Total Tax Wedge (MTTW), Single Individual, Various Earnings, 2018

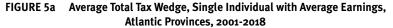


MTTW 67-2 = single, two children, 67 percent of average earnings; MTTW 67 = single (no children), 67 percent of average earnings; MTTW 100 = single, average earnings; MTTW 167 = single, 167 percent of average earnings.

FIGURE 4 Marginal Total Tax Wedge (MTTW), Married Couple with Two Children, Principal Earner with Average Earnings, Various Spousal Earnings, 2018



MTTW 0 = spouse with no earnings; MTTW 33 = spouse with 33 percent of average earnings; MTTW 67 = spouse with 67 percent of average earnings.



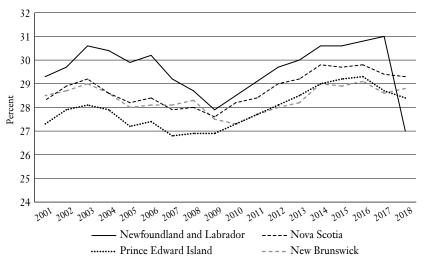


FIGURE 5b Average Total Tax Wedge, Single Individual with Average Earnings, Central Provinces, 2001-2018

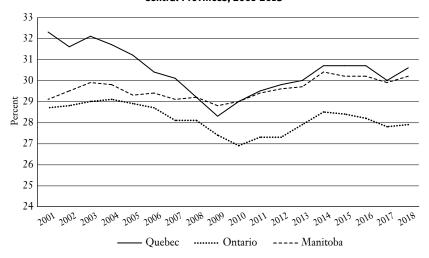


FIGURE 5c Average Total Tax Wedge, Single Individual with Average Earnings,
Western Provinces, 2001-2018

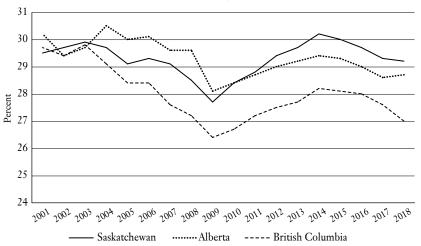
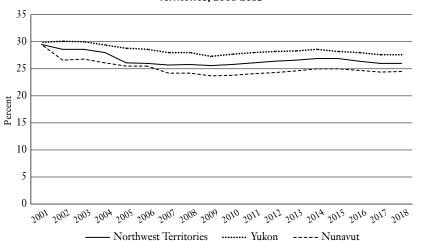
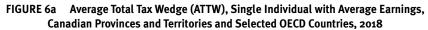


FIGURE 5d Average Total Tax Wedge, Single Individual with Average Earnings, Territories, 2001-2018





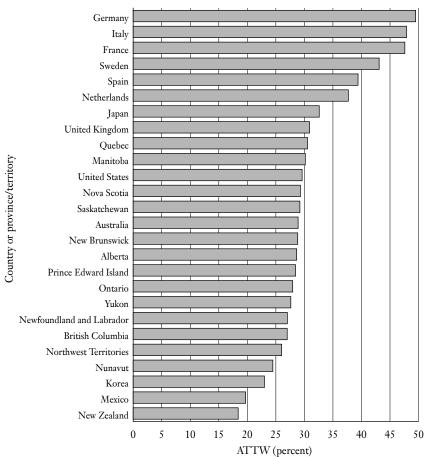
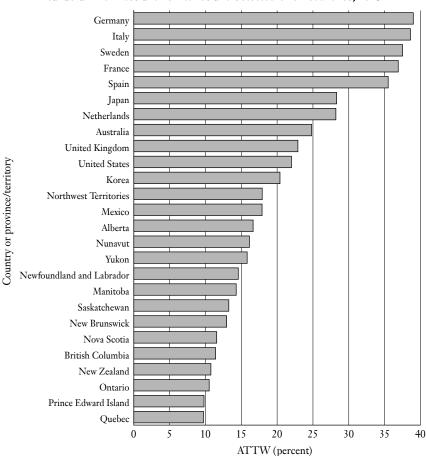


FIGURE 6b Average Total Tax Wedge (ATTW), Married Couple with Two Children,
Principal Earner with Average Earnings, Spouse with 33 Percent of Average Earnings,
Canadian Provinces and Territories and Selected OECD Countries, 2018



spouse earning 33 percent of average earnings). It is notable that the ATTW in Canada as a whole, and in some provinces in particular, is quite low relative to the selected OECD countries included in the figure, most particularly for married couples with children.

CONCLUDING COMMENTS

In this article, I have presented tax burden calculations using the OECD's *Taxing Wages* methodology for all Canadian provinces and territories. Calculations are presented for the years 2001-2018. The tax burden metrics are based on average wage earnings in each province/territory, which may differ across these jurisdictions; differences in the tax burden thus reflect both differences in the underlying tax/benefit system and differences in average earnings. The Finances of the Nation feature will update these calculations in future issues of this journal, and also will present alternative tax burden metrics.