

Université de Montréal

Rapport de recherche

**A MICRO-ECONOMIC INCIDENCE ANALYSIS OF FEDERAL
PUBLIC REVENUES AND SPENDING FOR CANADIAN
HOUSEHOLDS AND PROVINCES, 2007**

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Summary

The first objective of this study is to answer the question of who supports the burden of Canadian federal taxation and who benefits from federal spending. Using 2007 micro data from the Social Policy Simulation Database and Model (SPSD/M) and the Survey of Household Spending (SHS), this study calculates the net fiscal benefits received by household for the 10 provinces. On a whole, the federal fiscal system is found to be progressive.

A regression analysis further demonstrates that, using Ontario as the base of comparison, the province of residence will impact the net federal fiscal benefits that households receive. Residing in Alberta will have a negative impact on the federal fiscal benefit of a household, whereas residing in any other province will have, to varying degrees, a positive impact as compared to residing in Ontario. All these results are statistically significant, the one exception being British-Columbia. For this province, the model shows there is no statistically significant difference in the federal benefits received for households residing in British-Columbia instead of Ontario.

Finally, this study seeks to determine whether or not significant differences arise when using either micro or macro data to estimate federal fiscal balances by province. This analysis reveals that the methodological choice, between micro or macro data, has a significant effect in ranking the provinces according to per capita fiscal balance as well as determining the amount benefits received.

* I would like to thank François Vaillancourt for the invaluable guidance and insight that he has provided throughout the completion of this paper. I would also like to thank Andriana Bellou and Stephanie Rault for their comments on previous versions of this paper.

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1 Introduction

“Who supports the burden of taxation and who benefits from federal spending?” is a question of particular interest in a federal wealth redistributing country like Canada and where provincial and federal tensions are often the source of national debates. At first glance, the answer to this question seems rather obviously that the unit who is legally responsible to pay bears the burden of taxation. That is the case with households, who in general are not able to shift their tax burden onto other units. However, businesses are usually able to shift their tax burden, either partly or entirely, onto consumers through an increase in prices or onto factors of production through lower wages for example.

Moreover, the money that the federal government receives serves to finance transfers and services for the country’s residents. Thus, any complete analysis of the Canadian federal fiscal system requires the examination of “who benefits from federal spending”.

We seek to provide some insight on these matters. Our study thus answers the questions: “Who supports the fiscal burden of taxation?”, “Who benefits from federal spending” and “What are the household characteristics that contribute to these differences?”.

Finally, by aggregating the household micro data into provincial units, our study also seeks to shed some light on whether or not using household micro data, as opposed to macro data, produces different fiscal balance results.

2 Literature Review

In this section, we begin by looking at past studies on the two main components of fiscal incidence analyses: public revenues and public spending.

2.1 Studies on tax incidence

The first study that we look at is one by Payette and Vaillancourt (1986) which examines the incidence of federal and provincial fiscal systems in Quebec for the 1981 year. To calculate revenues per household, they base their work on data from Survey of Consumer Finances (SCF). To attribute the tax burden for, among others, the corporate tax and taxes on goods and services, the authors employ different progressive, regressive or proportional scenarios. Using a monetary revenue¹ definition, the authors conclude that income taxes are strongly progressive, corporate taxes are neutral or regressive, depending on the allocation hypothesis being skewed towards consumers or the owners of capital. They also find that the taxes on goods and services are regressive.

The work by Vermaeten, Gillespie and Vermaeten (1994) presents a detailed portrait of the incidence of federal taxes in Canada for the year 1988. To calculate effective tax rates, the authors develop three scenarios of fiscal incidence for the personal income tax, the corporate income tax, the sales tax, the payroll tax and property tax. In all scenarios, personal income taxes, sales taxes and other taxes are said to be supported by the entity legally responsible to pay. In the regressive scenario, the corporate tax is assumed to be

¹ The monetary revenue definition includes all market income and government transfer that individuals or households receive.

paid half by the holders of capital and half by consumers, whereas it is assumed paid entirely by the owners of capital in the progressive and standard scenarios. The consumption tax, in all scenarios is paid by the consumers. For the payroll taxes, the standard scenario assumes that the employees support the entire burden of taxation, the progressive scenario assigns the burden of the employer's contributions to the holders of capital, and the regressive scenario assigns the tax burden of both the employer and employee contributions to the consumer.

2.2 Studies on public spending

The incidence of public taxation has been, over the years, the focus of a large volume of literature. Studies on the incidence of public spending, however, are further and fewer between. When they are the focus of study, it tends to be in combination with taxation incidence analysis. Nonetheless, there has been some interesting work done to advance the particular questions surrounding the incidence of public spending. Payette and Vaillancourt (1986), is an example a double focused study that looks at both the incidence of public revenues and spending for the federal and provincial levels of government in Quebec for the 1981 year. The authors look at the economic family unit as defined by Statistics Canada. To distribute the benefits of public spending, the authors employ specific allocative hypothesis to data collected from the Survey of Household Spending (SHS), which measures the spending of households on numerous types of goods and services. Though the authors concede that this method is lacking in accuracy, given the available data, it proved to be well detailed. The authors find that the three largest spending categories, transfers, education and health, are progressive.

Another interesting study is by Mackenzie and Shillington (2009), which looks at the redistributive impact of public spending in Canada. Their study uses data from sources like the micro-data Social Policy Simulation Database and Model (SPSD/M) and the Canadian Institute for Health Information (CIHI). When possible, they attribute the benefits directly according to family characteristics or by the presence of direct beneficiaries as is the case for assigning education benefits based on the presence of children in a household. When direct beneficiaries are difficult to identify, they use indirect variables such as the amount spent on gasoline to assign benefits from road spending. Finally, in situations where uncertainty exists over the beneficiaries of certain spending, such as for protection of person and property, they use the two general allocators by revenue or by number of individuals in each household. Overall, Mackenzie and Shillington (2009) find that public spending on transfers and goods and services is progressive. They find that lower income households benefit more from transfer spending whereas middle income households benefit more from spending on goods and services.

3 Methodology and data

As individuals living under a common roof often share expenses and, to some degree incomes, the focus of our study is the household unit. Though as Kesselman and Cheung (2004) point out, there are some merits to looking at lifetime earnings, this cannot be done without a great degree of uncertainty. For example, it is virtually impossible to predict lifetime interests' rates. We therefore opt for an annual approach.

Our study looks at 2007 micro-data for all 10 Canadian provinces. The data used for our study comes from the consolidated tables of the Statistic Canada's Financial Management System (FMS) and from the Social Policy Simulation Database and Model (SPSD/M). This database is built by Statistics Canada with data from the Survey of Labour and Income Dynamics (SLID), the Survey of Household Spending (SHS), personal income tax declarations and historical data on demand for employment-insurance claims².

The SPSD/M offers many advantages when conducting fiscal incidence analyses. It allows for the data to be organised by family type, either economic, census or, as is the case in our work, by household. With thousands of variables and the ability to tailor the their output, the wealth of information the SPSD/M provides is invaluable when distributing benefits either directly or indirectly through a particular proxy variable. Finally, it provides a very large and representative sample size with 88,732 Canadian households represented. When applying the appropriate weights, our sample represents the total number of Canadian households: 13,489,587.

We separate these households into income deciles using the SPSD/M monetary income definition which includes all households' market and transfer income. The following table shows how many households are in each decile as well as what their monetary income is:

Table 1 - Income per decile, 2007, (x 1,000,000)

Deciles	1	2	3	4	5	6	7	8	9	10	Total
Total income	15,681	29,751	42,820	55,477	69,591	85,193	104,266	129,041	164,558	353,168	1,049,546
Average											
income per household (\$)	11,624	22,052	31,749	41,129	51,586	63,149	77,294	95,660	121,983	261,837	77,804
%	1.5%	2.8%	4.1%	5.3%	6.6%	8.1%	9.9%	12.3%	15.7%	33.6%	-

Source: SPSD/M, CANSIM tables and calculations by the author.

3.1 Federal public administration revenues

Our analysis looks at federal public revenues that represent a tax burden on Canadian households. Consequently, we exclude taxes on payments to non-residents, investment income, sales of goods and services and other revenue from own sources. Table 2 presents the federal public revenues included in our study, the various allocators we use and the incidence hypotheses we pose. The amounts presented come from Statistic Canada's Financial Management System (FMS) consolidated table 385-0001. The amounts of taxes paid per income decile are, for the most part, distributed according to SPSD/M allocator variables.

² For a complete description on how the SPSD/M was constructed, please consult the Database Creation Guide published by Statistics Canada at the address :
<http://ivt.crepuq.qc.ca/smsps/documentation/DatabaseCreationGuide.pdf> (site consulted June 2nd 2013)

Table 2 - Public federal revenues by category and allocators employed (SPSD/M), Canada, 2007

Type of taxes	Allocator	Incidence	Amount (X 1 000 000)
Income taxes			142,195
1. Personal income taxes	Net Federal Taxes (imtxf) + Quebec tax abatement (imqta)	100% households (with adjustment to revenues)	104,125
2. Corporate income taxes	Household expenditures net of taxes (ctnexp) + Dividend income (ididiv) + wages and salaries (idiemp)	33% consumers, 33% owners of capital, 33% workers	38,070
Consumption taxes			45,139
3. General sales tax	Federal GST (ctfgst) + Federal GST on housing (ctfgsth)	100% consumers	32,120
4. Alcoholic beverages and tobacco taxes	Federal excise duties (ctfexd) + Federal excise taxes (ctfext)	100% consumers	3,668
5. Amusement tax	Spending on games of chance (n201)	100% consumers	14
6. Gasoline and motor fuel taxes	Federal excise duties (ctfexd) + Federal excise taxes (ctfext)	100% consumers	5,073
7. Customs duties	Federal custom import duties (ctfcid)	100% consumers	3,651
8. Other consumption taxes	Federal excise duties (ctfexd) + Federal excise taxes (ctfext)	100% consumers	613
Other taxes			1,636
9. Natural resource taxes and licences	Household expenditures net of taxes (ctnexp) + Dividend income (ididiv) + wages and salaries (idiemp)	33% consumers, 33% owners of capital, 33% workers	662
10. Miscellaneous taxes	Household expenditures net of taxes (ctnexp)	100% consumers	974
Contributions to social security plans			24,325
11. Contributions to social security plans	QPP/CPP contributions (imcqppc) + Employment insurance contributions (imuic)	100% households	54,484
Total	-	-	240,454

3.1.1 Income taxes

Income taxes include personal federal income taxes and federal corporate income taxes.

Line 1 - Personal income taxes

In our analysis, we assume that the tax burden of personal income tax falls on the economic unit legally responsible to pay it. Consequently, we attribute, for each household, the federal income tax amount, found in CANSIM table 385-0001, according to the corresponding direct SPSD/M variable. We also make an adjustment to take into account the Quebec tax abatement. We use the SPSD/M total tax abatement variable to determine how much tax abatement Quebec households receive. We then subtract these amounts from the total personal income taxes paid per household which gives us the personal income taxes paid per household, adjusted for the Quebec tax abatement.

Line 2 - Corporate income taxes

Though corporations are distinct legal entities, the tax burden can, to varying degrees, be shifted on to workers, consumers and the owners of capital. The recent literature is uncertain as to what proportion is attributable to each type of agent, we thus split the amounts found in CANSIM table 385-0001 into three equal parts: workers (1/3), consumers (1/3) and capital owners (1/3). We then distribute these sums according the SPSD/M variables for household wages and salaries, household consumption spending and household incomes coming from dividends.

3.1.2 Consumption taxes

Consumption taxes are the direct taxes that are added on to the prices households pay when they purchase goods and services. They can also be taxes on inputs that businesses shift onto consumers through higher prices. Consumption taxes, both direct and indirect, are ultimately paid for by the consumers of the various goods and services. The consumption tax of the SPSD/M incorporates both the direct and indirect parts of these taxes.

Line 3 - General sales tax

The General sales tax (GST) is a direct tax paid by consumers. We use the SPSD/M variables, for GST on goods and services and GST on households to distribute per household the amount shown in line 3 of Table 2.

Line 4 - Alcoholic beverages and tobacco taxes

Consumption taxes of this category are for the excise taxes and duties on volume of alcohol as well the excises taxes and duties on tobacco products. To distribute the amount show in line 4 of Table 2, we use the SPSD/M variables for the amount of federal excise duties and federal excise taxes paid per household.

Line 5 - Amusement tax

According to the SGF, federal taxes of this category are for taxes on hippodromes. Consequently, we use the amount households spend on games of chance, from the Survey of Household Spending (SHS), to distribute per income decile, the amount shown in line 5 of Table 2. Because the number of households per income decile in the HSS differs from the number in the SPSD/M, for the purposes of our study, we further distribute the

HSS decile results on a per capita basis within the corresponding SPSD/M deciles. This distribution will not affect the overall results but will be useful for our regression analysis.

Line 6 - Gasoline and motor fuel taxes

To distribute the amount show on line 6 of Table 2, we use the SPSD/M variables for amount of federal excise duties and federal excise taxes per household.

Line 7 - Customs duties

The SPSD/M variable for federal customs import duties was used to distribute the amount paid per household.

Line 8 - Other consumption taxes

This category includes taxes on airplane transportation, meals, hotel rooms and other various types of consumption taxes. We distribute the amount on line 8 of Table 2 according the SPSD/M variables for federal excise taxes and duties paid per household.

3.1.3 Other taxes

Line 9 - Natural resource taxes and licences

We assume this category of taxes to be similar to corporate income taxes. Consequently, we employ the same hypothesis of incidence as for the corporate taxes: workers (1/3), consumers (1/3) and capital owners (1/3). We distribute the amount found on line 9 of Table 2 according to the SPSD/M variables for household wages and salaries, household consumption spending and household incomes coming from dividends.

Line 10 - Miscellaneous taxes

This category of taxes includes agricultural insurance premiums, insurance premium taxes, hunting and fishing licences, liquor licenses and other licences, permits and business fines, penalties and donations. Because we make the hypothesis that the consumer is the one who bears the tax through an increase of prices, we distribute the amount on line 10 of Table 2 according to the SPSD/M variable for household consumption spending.

3.1.4 Contributions to social security plans

Line 11 - Contributions to social security plans

At the federal level, this category of taxes represents the Employment Insurance (EI) and Canadian Pension Plan (CPP) contributions of employees and employers. For all contributions, we make the hypothesis that the incidence falls on the entity legally responsible to pay them.

To allocate employer and employee EI contributions made, the amount of which is found in CANSIM table 385-0002, we use the SPSD/M direct variable for employment insurance contributions per household.

Similarly, to allocate the amount of employer and employee CPP contributions, found in CANSIM table 384-0006, we use the SPSD/M direct variable for CPP/QPP contributions per household.

However, Quebec has its own pension plan, which means contributions from Quebec households to the federal pension plan are lower. Because of this fact, coupled with the fact that our allocator combines contributions to both the provincial and federal plans, a few calculations are required to estimate Quebec CPP households' contributions.

We do this by first identifying the total Quebec CPP contribution amount found in CANSIM table 385-0005. From this information we calculate a CPP / Total Quebec Pension Plan ratio. We then use this ratio and the CPP/QPP variable to allocate the household contributions.

3.2 Federal spending

To measure the amount of benefit each household receives from government spending, we employ a direct benefits approach; every dollar spent by the federal government translates into a dollar worth of benefit for a household. We divide federal spending into two broad categories: spending in transfer payments to individuals, and spending on goods and services, which also includes spending on transfers to other governments.

The first category comprises a variety of programs and tax benefits to help particular individuals of society. We use SPSD/M variables to identify the households that benefit from these programs and attribute the benefits accordingly.

The second category encompasses spending on more indirect services such as road and health services as well as transfers to sub-national governments. When possible, we use proxy variables from the SPSD/M database or from the Survey of Household Spending (SHS) to attribute the benefits of these spending categories. In cases where proxy variables aren't available or easily identifiable, we use two general allocators: a per capita allocator or an allocator based on household incomes. We refer to these two different scenarios as the general per capita allocator scenario and the general per income allocator scenario.

Table 3 presents the federal public spending categories included in our study, the various allocators we use and the incidence hypotheses used.

Table 3 - Federal spending by category, 2007

Type of spending	Allocator	Amount (X 1 000 000)
Transfers		75,345
1. Transfers to the elderly	Old age security benefits (imioas) + Guaranteed income supplement benefits (imigis) + Spouses allowance (imispa)	27,299
2. Canadian Pension Plan (CPP)	CPP/QPP Benefits (imicqp) + adjustments for QC (Cansim table 384-0009)	21,963
3. Employment insurance benefits	Employment insurance benefits (imuib)	10,651
4. Social assistance	Federal Sales Tax Credit (imfstc) + Quebec tax abatement (imqtar) + Federal other refundable tax credits (imfortc)	3,584
5. Family allowance	Child Tax Benefit (imfcben) + federal Universal Child Care Benefit amount received (imiuccbr)	8,801
6. Veterans' benefits	Cansim 384-0009 per capita 60+	3,047
Transport and communications		3,668
7. Roads and bridges	Motor Fuels and Lubricants (cttxfc30)	322
8. Public transportation	Spending on public transportation (k031)*	1,179
9. Air transportation	Spending on long distance traveling (k034tot)*	372
10. Rail transportation	Spending on long distance traveling (k034tot)*	217
11. Maritime transportation, postal services and telecommunications	Per capita (hdnpers)	1,579
Health**		22,898
12. Hospital care	Age and gender - (CIHI)	42
13. Medical care	Age and gender - (CIHI)	354
14. Preventative care	Per capita (hdnpers)	1,136
15. Other health services	Per capita (hdnpers)	21,366
Education		6,950
16. Primary and secondary education	Per capita 5-17	1,046
17. Post-secondary education	Research : per capita (hdnpers) + Student Loans : Interest paid on student loans (idintstu)	2,967

18. Special retraining services	Per capita 18-65 (hdnpers)	1,963
19. Other education	Per capita (hdnpers)	974
Housing		3,502
20. Housing	Tenure (hdtenur)	3,502
Resource conservation and industrial development		9,801
21. Agriculture	Type of industry (idind = 1)	3,967
22. Hunting, fishing, oil, mining, forest, marine, etc.	Per capita (hdnpers)	5,834
Protection of person and property, environment, etc.		32,928
23. Protection of person and property	General allocator scenarios : per capita & per income	27,308
24. Environment	General allocator scenarios : per capita & per income	2,166
25. Research establishments	General allocator scenarios : per capita & per income	3,391
26. Other expenditures	General allocator scenarios : per capita & per income	63
Regional planning and development, labour, employment, etc.		13,187
27. Regional planning and development	General allocator scenarios : per capita & per income	260
28. Labour, employment and immigration	General allocator scenarios : per capita & per income	2,102
29. Recreation and culture	General allocator scenarios : per capita & per income	4,323
30. Foreign affairs and international assistance	General allocator scenarios : per capita & per income	6,502
General government services		9,011
31. General government services	General allocator scenarios : per capita & per income	9,011
General purpose transfers to other government subsectors		20,295
32. General purpose transfers to other government subsectors	By province and then by general allocator scenarios : per capita & per income	20,295
Debt Charges		21,479
33. Debt Charges	General allocator scenarios : per capita & per income	21,479
Transfers Total	-	75,345
Goods and services total	-	143,719
Total	-	219,064

3.2.1 Federal transfer categories

Spending on personal federal transfers mainly benefits the households that receive them. The sums that we distribute come from the “Consolidated federal, provincial, territorial and local government revenues and expenditures”. Though the CANSIM table 385-0001 has its own 5 sub-categories of transfers, presented in the “Social Services category”, the precision with which the SPSD/M variables can attribute federal transfers spending per household lead us to reorganise the SPSD/M’s 10 federal transfer variables into our own 5 categories of federal transfers. These new categories are: elderly individuals, CPP, Employment insurance benefits, other social services and veterans’ benefits. To harmonise the sums from both sources, we simply multiply the SPSD/M results by a scalar value. A description of each of our new categories, and the combination of SPSD/M allocators we used, is described in the following section.

Line 1 - Transfers to the elderly

This sub-category includes transfers for old age security payments, the spouse allowance program and the guaranteed income supplement benefits. Though the Canadian Pension Plan is geared towards elderly people as well, we address it as a separate spending line. We distribute the benefits directly to the individuals, and consequently to their household unit, based off of the SPSD/M variables associated with the three previously mentioned types of transfers.

Line 2 – Canadian Pension Plan (CPP)

The Canadian Pension Plan targets individuals from the age of 60, with reduced pension, to 65 and over for a full pension³. Quebec being the only province that has opted out of the federal program and which employs its own similar Quebec Pension Plan, federal CPP received in this province is limited. Based off of the 384-0009 CANSIM table, we are able to identify how much CPP is spent in Quebec and the rest of the country. Finally, though we distribute the Quebec CPP amount only among Quebec households (and the rest of the CPP amount among the 9 other Canadian provinces’ households) the methodology is the same: according to how many individuals over the age of 65 are present in each household.

Line 3 – Employment insurance benefits

This type of transfer benefits the direct recipients of employment insurance benefits, and their households. We distribute the amount on line 3 in Table 3 according to the associated SPSD/M variable for individuals in each household.

Line 4 - Social assistance

This category includes three direct transfers: the federal sales tax / GST credit, the Quebec tax abatement and the federal other refundable tax credits. They benefit the individuals and families who receive them. We distribute the amount on line 4 in Table 3 according to the associated SPSD/M variables.

³ Though recent changes to the federal rules means that the current retirement age in Canada is 67, because our study is for 2007 household data, we consider the retirement age to be 65.

Line 5 – Family allowance

This category benefits the households that receive the Child Tax Benefit and the federal Universal Child Care Benefit. We distribute the amount on line 4 in Table 3 according to the associated SPSD/M variables.

Line 6 -Veterans benefits

Veterans' benefits spending include administrative costs, pension, allowances, grants provision of medical supplies and all other benefits attributed to military veterans. This type of transfer concerns primarily men over the age of 60 years old and some women over the age of 55 years old.

Because our data does not allow us to determine the exact beneficiaries from this type of spending, we distribute the amount found on line 6 of table 3 among households with a male of at least 60 years old. We also include households without a male but with a female over the age of 60 since deceased veterans' spouses have access to veterans' benefits.

3.3 Federal goods and services spending

Federal goods and services benefit the individuals and households who use these goods and services. Associating the output of goods and services to such use however can be challenging. Depending on the type of good or service, we employ proxy values to distribute among Canadian households the amount of benefit each receives. Unless specified otherwise, the amounts that we distribute are from the CANSIM table 385-0001. The proxy values mostly come from the SPSD/M database and the SHS. In cases where specific proxy values are not easily identifiable, we employ two alternative general allocators: a per capita allocator or a household income allocator.

3.3.1 Transportation and communications

The beneficiaries of spending on transportation and communications can be separated into three categories: the users, the business owners and the consumers. We have divided the amounts from CANSIM table 385-0002 into 5 sub-categories: roads and bridges, public transport, air transportation, rail transportation and maritime, postal services and telecommunications.

Line 7 - Roads and Bridges

Roads and bridges spending is mainly for the construction of new roads as well as repairing existing structures. It provides a direct benefit to drivers and businesses that use them by facilitating mobility as well as providing access to public, private and commercial buildings. To a lesser degree this type of spending also provides an indirect benefit to consumers through the lowering of prices, as a result of cheaper transportation costs.

Unable to properly measure the extent of this indirect benefit, we focus on attributing a direct benefit to households. To do so, we look at household gas consumption. Though regional gas price disparities do exist and might under or overestimate the benefits of some households in certain provinces, a large portion of these disparities come from provincial taxation. Because federal gas taxes are applied before provincial ones, we therefore allocated the benefits of road and bridge spending according to the amount of federal gas tax each household pays.

Line 8 - Public transportation

Public transport spending benefits the individuals that use the service either by improving the level of service or by providing a subsidy for the fares. It could also be argued that public transport indirectly benefits car users, by reducing the amount of traffic on the roads. However, we make the hypothesis that the benefits are attributable to the direct users of public transportation.

We therefore distribute the benefits among households based on the amount of public transport spending on this type of service. The variable we employ comes from the SHS. Because the number of households per income decile in the SHS differs from the number in the SPSD/M, for the purposes of our study, we further distribute the SHS decile results on a per capita basis within the corresponding SPSD/M deciles. This distribution will not affect the overall results but will be useful for our regression analysis.

Line 9 – Air transportation

Air travel provides both a direct benefit to individuals that fly and businesses that ship their products by plane. This type of spending also indirectly benefits aerospace industry and their employees as well as consumers through improved transportation systems, a larger variety of available products and more affordable prices. However, contrary to other types of transportation, air transportation of commercial goods represents only a small portion of the airline industry⁴. The indirect benefits being hard to measure, we use the SHS variable for amount of money spent on long-distance traveling, to distribute the direct benefits among households.

Line 10 – Rail transportation

Similarly to air travel, rail transportation benefits the industry's employees, the individuals that use rail for transportation, businesses that transport their products by rail and consumers that benefit from cheaper prices of goods. The other types of benefits being hard to measure, we focus on direct usage of rail transportation by households. We use the SHS variable for amount of money spent on long-distance traveling. Because the number of households per income decile in the SHS differs from the number in the SPSD/M, for the purposes of our study, we further distribute the SHS decile results on a per capita basis within the corresponding SPSD/M deciles. This distribution will not affect the overall results but will be useful for our regression analysis.

Line 11 – Maritime transportation, postal services and telecommunications

This type of spending benefits all members of society on a daily basis. Because it is nearly impossible to quantify with precision how often an individual posts a letter or makes a phone call, for example, we simply attribute the benefits of this category of spending according to the number of individuals present in each household.

3.3.2 Health

Though the lion's share of health spending is at the provincial level, from the CANSIM table 385-0001 we identify four types of federal spending: hospital, medical, preventative and other

⁴ For example, in 2007, the value of transported goods represented only 7,5% of Air Canada's revenues (1 220\$ M) whereas passenger revenues represented 87,3% (\$14 178 M) – p.A125
<http://www.tc.gc.ca/media/documents/policy/addendum2009.pdf> (consulted July 15th 2013)

health services. We use the “National health expenditure trends, 1975 to 2011”⁵, published by the Canadian Institute for Health Information (CIHI), to derive the costs of 20 different age categories for each gender. We harmonise the values in the annual report with the amounts found on lines 12-15 of table 3.

Lines 12-13 - Hospital care and medical care

Spending on hospital care and medical care varies according to the age and gender of individuals. To determine the amount of money spent on each individual, we use the gender and age costs estimates, by type of service, found in the “National health expenditure trends, 1975 to 2011” published by The Canadian Institute for Health Information (CIHI) and allocate the benefits received by each household according to the number of individuals of a certain age and gender present as determined by the SPSD/M data.

Lines 14-15 - Preventative care and other health services

Preventative care reduces the spread of disease, boosts the overall health of the country and lessens the pressure on public health resources. Other health services includes spending for health related administration, health statistics and outlays on protection of health and health inspections, as well as other general health services. Because these two spending categories provide a benefit to all individuals, we distribute the sums on line 14 and 15 of table 3, among households on a per capita basis using SPSD/M data.

3.3.3 Education

Line 16 - Primary and secondary education

Though education mostly falls under provincial jurisdiction, the federal government is responsible for providing education for, among others, the children of native and of military families. Unable to identify which households reflect these attributes, we allocate the federal primary and secondary education by number of children from ages 5-17 present per household.

Line 17 - Post-Secondary education

The federal spending in this category refers to direct and indirect expenditures for research in post-secondary institutions as well as direct transfers to students in the form of bursaries, scholarships and student financial assistance. Because the student loan program is not available in Quebec, to distribute the benefits, we must, therefore make a distinction between the post-secondary spending in the form of direct transfers and for research.

We determine the expenditures on the student loan program based on the Consolidated Canada Student Loans Programs – Combined Programs from the “Canadian student loans program : Annual report 2006-2007”⁶. Because the principal is repaid by the students, we only consider the 986,3 \$M in expenses to run the programs, interest subsidies, scholarships, grants and bad debt expenses, as being a public benefit provided by the federal government.

Direct transfers to students benefit the few individuals who have either received bursaries or scholarships. It also benefits the individuals who have gained access to loans and who, because these loans are government backed, have received better rates on these loans or even have their

⁵ https://secure.cihi.ca/free_products/nhex_trends_report_2011_en.pdf

⁶ [http://www.debt101.ca/sites/default/files/CSLP%20Annual%20Report%202006-07%20\(2008\).pdf](http://www.debt101.ca/sites/default/files/CSLP%20Annual%20Report%202006-07%20(2008).pdf)

loan paid for by the government (through debt forgiveness of default). Unable to identify the households who benefited from scholarships and bursaries, the amount is distributed among the 9 provinces (excluding Quebec), according to the SPSD/M variable for amount of student loan interest paid. Since research and development benefits both the researchers and the general population, and because we are unable to identify the researchers, we distribute the benefits received from spending on research on a per capita basis.

Line 18 - Special retraining services

Spending of this type is to upgrade the skills of individuals who are out of school and who are currently employed or seeking employment. We allocate the sums according to the number of individuals within each household between the working ages of 18-65. We chose the age 65 because it represents our reference year's (2007) retirement age.

Line 19 - Other education

These types of expenses include general administration expenses of the departments of education, the cost of gathering and analysing education related statistical data and payments made to the private sector to help foster the proficiency of either official language. Since the whole economy benefits from having some form of national education planning, which requires statistical information, we attribute the benefits from the spending in this category on a per capita basis.

3.3.4 Housing

Line 20 - Housing

Spending of this category goes towards the construction and upkeep of low income housing. We distribute the amount of line 20 in Table 3 on a per capita basis, for tenant households only, among the 5 lowest income deciles. By distributing the benefits accordingly, we make the implicit assumption that there is a link between the size of a household, their apartment, and the amount received.

3.3.5 Resource conservation and industrial development

Line 21 - Agriculture

Though it can be argued that federal agriculture spending helps reduce costs to consumers, it is likely that because measures such as quotas, tariffs and marketing boards, this spending helps farmers by raising prices. Consequently, we follow the Payette and Vaillancourt (1986) example and attribute the benefits of such spending to the producers and their households. With 2007 SPSD/M data, we allocate federal spending on agriculture, as found in CANSIM table 388-0002, on a per capita basis amongst the households that report their primary source of income as coming from agriculture.

Line 22 – Hunting, fishing, oil, mining, forest, marine, etc

Spending in this category benefits the people who work in these types of industries, households that benefit from the industries' derived products and business owners that sell these industries' derived products. Unable to precisely determine which households benefit and to what degree, we distribute the benefits of federal spending according to two scenarios: the general per capita allocator and the general per income allocator.

3.3.6 Protection of person and property, environment, research establishments and other expenditures

Lines 23, 24, 25 and 26 – Protection of person and property, environment, research establishments and other expenditures

The benefits of this category are difficult to attribute because they tend to have important externalities. For example, protection from fire most certainly benefits the owner of a rental property, but it also helps protect the tenant. Police protection in high crime low income areas certainly benefit the residents of those areas but it also benefits the richer neighbourhoods and households who might otherwise be the target of more crimes. National defence benefits individuals that own international property or travel abroad as well as all citizens that remain within Canadian borders. These are all examples that demonstrate just how difficult it is to measure and attribute the benefits from these kinds of spending categories. We consequently distribute the benefits of federal spending according to two scenarios: the general per capita allocator and the general per income allocator.

3.3.7 Regional planning and development, labour employment and immigration, recreation and culture and foreign affairs and international assistance

Lines 27, 28, 29 and 30 – Regional planning and development, labour employment and immigration recreation and culture and foreign affairs and international assistance

The first three types of spending directly benefit individuals that either live in regions, individuals having benefited from work, employment or immigration related programs or individuals that use recreation or cultural centres. Spending on foreign affairs and international assistance promotes Canadian interests and thus benefits all individuals. Since these are such broad and wide reaching spending categories, we distribute the benefits of federal spending according to two scenarios: the general per capita allocator and the general per income allocator.

3.3.8 General government services and general purpose transfers to other government subsectors

Lines 31 and 32- General government services and general purpose transfers to other government subsectors

General government services include executive and legislative services as well as other general administration expenditures. General purpose transfers to other government subsectors include the Canada Health and Social Transfer as well as other non-specific transfers. We allocate the benefits of federal spending according to two scenarios: the general per capita allocator and the general per income allocator.

3.3.9 Debt charges

Line 33 – Debt charges

When government expenditure exceed their revenues, they incur debt and consequently must pay interest and other debt charges on transfers, goods and services previously provided. Because it is unclear for what category of spending debt was incurred, we distribute the benefits of federal spending according to two scenarios: the general per capita allocator and the general per income allocator.

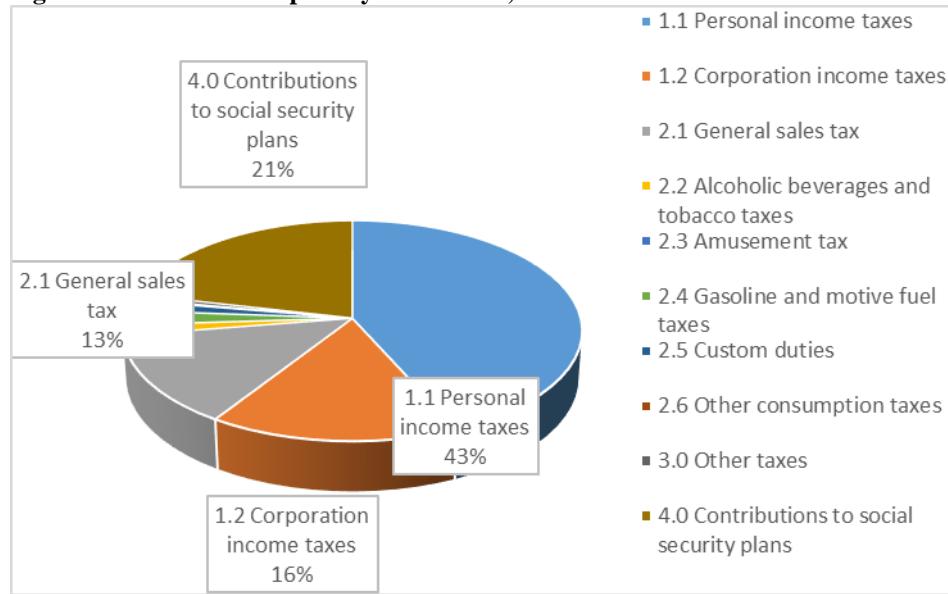
4 Descriptive statistics: federal revenues and spending

In this section, we briefly examine the composition and distribution of federal revenues and spending across households by decile.

4.1 Household tax burden

The 4 broad categories of federal taxes paid by households include income taxes, consumption taxes, other taxes and contributions to social security plans. Income taxes represent nearly two-thirds of federal taxes and includes both personal income taxes (43%) and corporate income taxes (16%) (Figure 1). Contributions to social security plans represent the second largest tax category (21%). The third largest category, consumption taxes, globally represents about one fifth of federal taxes but as figure 1 demonstrates, much of this comes from general sales taxes (13%). The remaining types of taxes are negligible.

Figure 1 – Federal taxes paid by households, 2007



Source: SPSD/M, CANSIM tables and calculations by the author.

Table 4 shows the average amount of taxes, by tax category, paid by households in each decile.

Table 4 - Average amount \$ of federal taxes paid per household, per decile, 2007

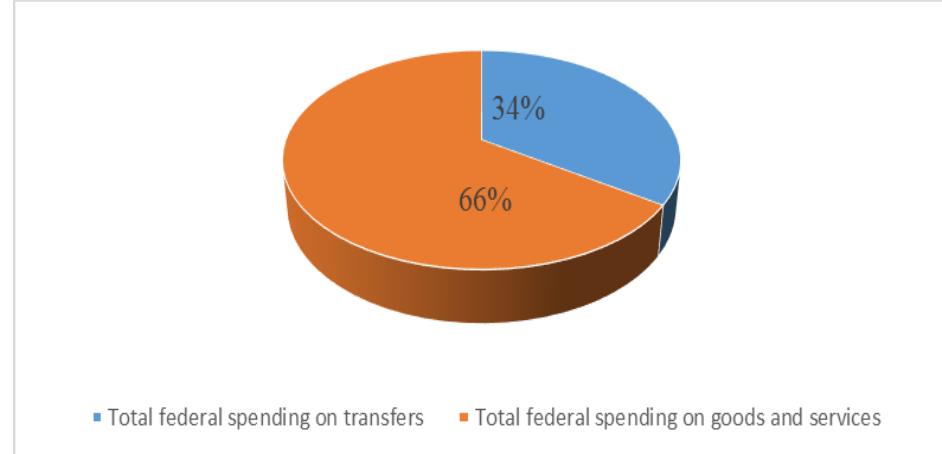
Type of tax	1	2	3	4	5	6	7	8	9	10	All
Income taxes	478	1,017	1,827	3,109	4,645	6,400	8,674	12,146	16,678	50,440	10,541
Consumption Taxes	1,145	1,490	2,055	2,481	2,948	3,211	3,763	4,269	5,074	7,026	3,346
Other taxes	8	15	21	31	39	47	59	69	84	840	121
Contributions to social security plans	228	588	1,246	2,169	2,944	3,854	4,944	5,998	7,526	8,667	3,817
Total	1,860	3,110	5,149	7,790	10,576	13,512	17,441	22,483	29,362	66,974	17,825
Total/income (%)	16.0%	14.1%	16.2%	18.9%	20.5%	21.4%	22.6%	23.5%	24.1%	25.6%	22.9%

Source: SPSD/M, CANSIM tables and calculations by the author.

4.2 Federal spending received by household

Federal spending on goods and services is about twice the amount as spending on transfers (Figure 2).

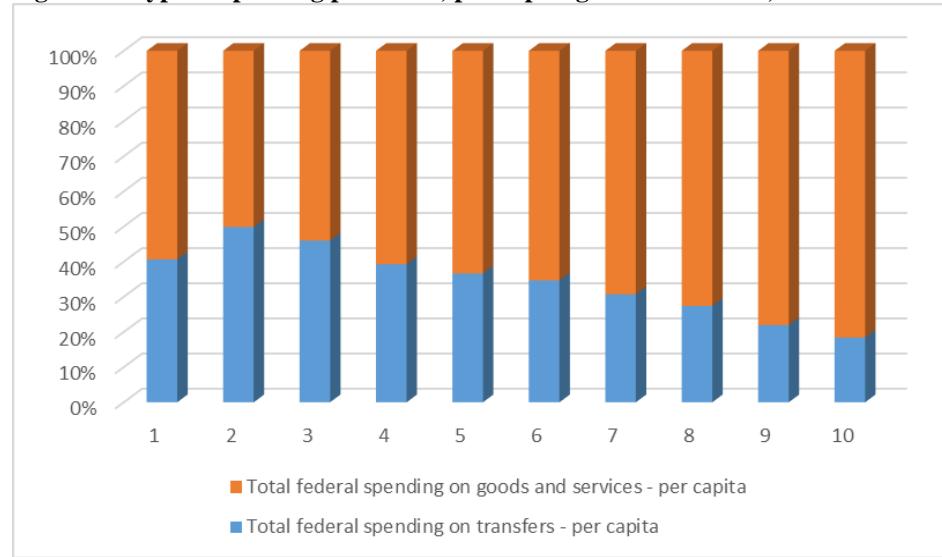
Figure 2 – Federal Spending, by type, 2007



Source: SPSD/M, CANSIM tables and calculations by the author.

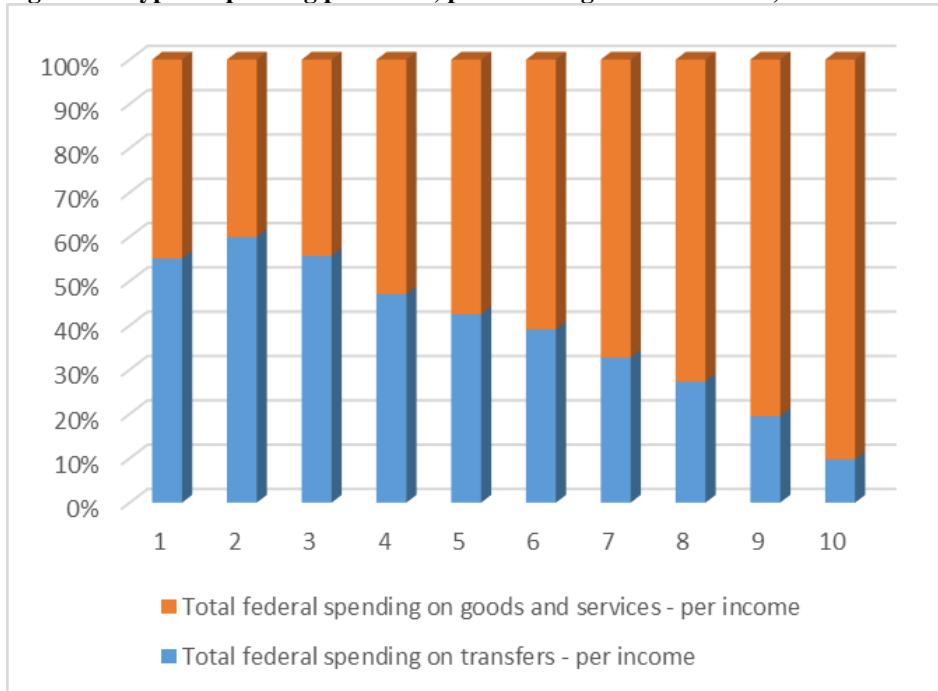
Per decile, we notice that transfers become less and less important as households income increases. This is true for the general per capita allocator scenario (Figure 3), and even more marked for the general per income allocator scenario (Figure 4).

Figure 3 - Type of spending per decile, per capita general allocator, 2007



Source: SPSD/M, CANSIM tables and calculations by the author.

Figure 4 - Type of spending per decile, per income general allocator, 2007



Source: SPSD/M, CANSIM tables and calculations by the author.

Table 5 presents the average amount of transfers each household receives. The results are presented by income deciles.

Table 5 - Amount \$ of federal transfer spending per household, per decile and all deciles together, 2007

Federal Transfers	1	2	3	4	5	6	7	8	9	10	All
Elderly People	2,530	3,786	3,465	2,170	2,115	1,776	1,451	1,271	958	714	2,024
CPP	694	2,281	2,148	2,025	1,874	1,841	1,675	1,453	1,154	1,137	1,628
Workers' compensation benefits	286	460	731	912	928	1,067	1,069	992	828	622	790
Social assistance	370	457	474	316	220	180	171	137	164	169	266
Other social services	346	659	950	975	813	849	666	654	372	241	652
Veterans' benefits	242	374	309	247	229	205	191	164	144	152	226
Total	4,468	8,018	8,077	6,645	6,179	5,917	5,224	4,670	3,620	3,035	5,585
Total/income (%)	38.4%	36.4%	25.4%	16.2%	12.0%	9.4%	6.8%	4.9%	3.0%	1.2%	7.2%

Source: SPSD/M, Cansim tables and calculations by the author.

Table 6 and Table 7 present the average amounts of goods and services spending each household receives. The results are for the two different general allocator scenarios.

Table 6 - Amount \$ of federal goods and services spending per household and per decile and all deciles together, per capita general allocator scenario, 2007

Federal Spending on Goods and services - per capita	1	2	3	4	5	6	7	8	9	10	All
Transport and Communications	125	140	185	202	236	268	301	323	387	551	272
Health	1,156	1,886	1,853	1,699	1,681	1,709	1,698	1,750	1,726	1,817	1,697
Education	216	270	369	436	497	559	629	679	742	755	515
Housing	735	589	516	432	324	0	0	0	0	0	260
Resource conservation and industrial development	415	477	581	892	805	771	851	868	749	858	727
Protection of person and property; Environment... : by pop	1,272	1,551	1,969	2,194	2,379	2,642	2,811	3,021	3,213	3,359	2,441
Regional planning and development; Labour, employment ... : by pop	510	621	788	879	953	1,058	1,126	1,210	1,287	1,345	978
General government services : by pop	348	424	539	600	651	723	769	827	879	919	668
General purpose transfers to other government subsectors : by pop	914	1,087	1,386	1,499	1,595	1,687	1,763	1,707	1,777	1,631	1,504
Debt charges : by pop	830	1,012	1,284	1,431	1,552	1,723	1,834	1,970	2,096	2,191	1,592
Total	6,521	8,056	9,470	10,264	10,672	11,140	11,781	12,355	12,855	13,426	10,654
Total/income (%)	56.1%	36.5%	29.8%	25.0%	20.7%	17.6%	15.2%	12.9%	10.5%	5.1%	13.7%

Source: SPSD/M, CANSIM tables and calculations by the author.

Table 7 - Amount \$ of federal goods and services spending per household and per decile, per income general allocator scenario, 2007

Federal Spending on Goods and services - per income	1	2	3	4	5	6	7	8	9	10	All
Transport and Communications	125	140	185	202	236	268	301	323	387	551	272
Health	1,156	1,886	1,853	1,699	1,681	1,709	1,698	1,750	1,726	1,817	1,697
Education	216	270	369	436	497	559	629	679	742	755	515
Housing	735	589	516	432	324	0	0	0	0	0	260
Resource conservation and industrial development	254	324	408	732	670	654	783	865	858	1,718	727
Protection of person and property; Environment... : by pop	365	692	996	1,290	1,618	1,981	2,425	3,001	3,827	8,215	2,441
Regional planning and development; Labour, employment ... : by pop	146	277	399	517	648	793	971	1,202	1,533	3,290	978
General government services : by pop	100	189	273	353	443	542	664	821	1,047	2,248	668
General purpose transfers to other government subsectors : by pop	306	539	779	970	1,186	1,407	1,684	1,847	2,298	4,029	1,504
Debt charges : by pop	238	451	650	842	1,056	1,292	1,582	1,958	2,496	5,358	1,592
Total	3,641	5,357	6,428	7,472	8,360	9,207	10,737	12,446	14,913	27,982	10,654
Total/income (%)	31.3%	24.3%	20.2%	18.2%	16.2%	14.6%	13.9%	13.0%	12.2%	10.7%	13.7%

Source: SPSD/M, CANSIM tables and calculations by the author.

5 Household results

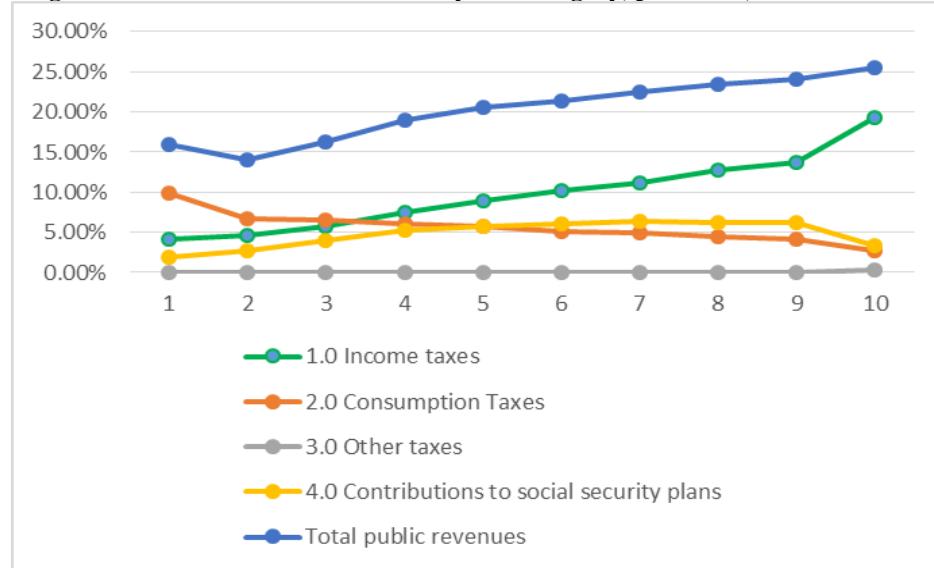
This section looks at the results of our allocation exercise and is broken up into three parts. We first examine the incidence of federal taxation. We then look at the incidence of federal spending, for both transfers and goods and services. Finally, we put both taxation and spending together to determine the net federal fiscal benefit of each household.

5.1 Federal effective tax rates

When looking at tax incidence, we say the effective rates are progressive when higher rates are paid by higher income earners, regressive when higher rates are paid by lower income households and proportional when the rates paid are more or less equal across income deciles.

Though most of the taxes are either regressive or proportional, effective income tax rates are distinctively progressive. This is because personal income taxes, which are distinctively progressive, represent such an important part of public revenues; their effect trumps all other tax effects.

Figure 5 - Incidence of income taxes by sub-category, per decile, 2007



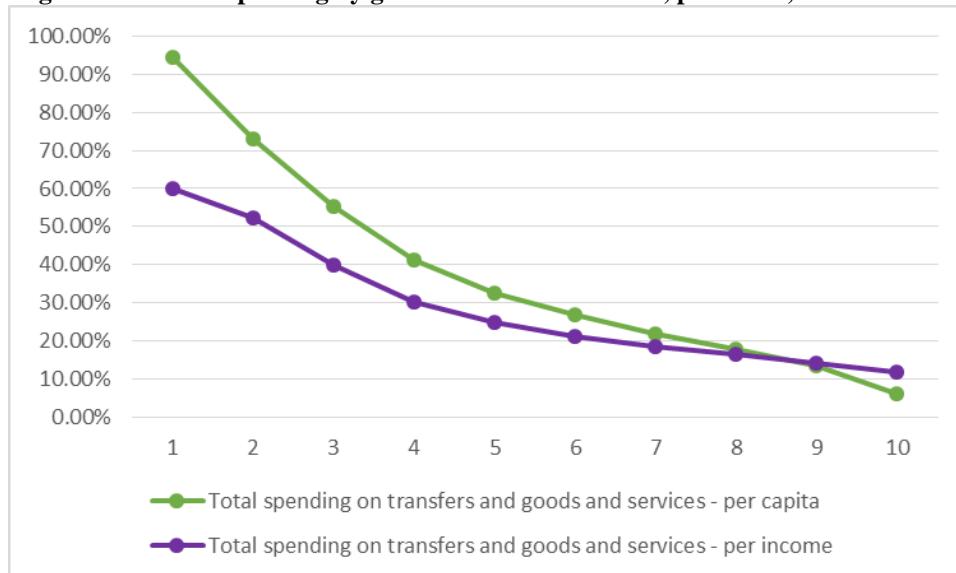
Source: SPSD/M, CANSIM tables and calculations by the author.

The exception being the dip we see between the first and second deciles (Figure 5). This can be explained by the fact that consumption taxes are very regressive and represent a large portion of the first decile's income (Table 4). It should also be noted that in the context of our study, we made the hypothesis that the burden of the corporate income tax falls equally upon workers, consumers and capital owners. This allocation, though common, does not in fact find unanimous support. It is conceivable to think that, in an open economy where international competitors can offer substitute products to consumers, the corporate tax burden would fall solely on workers and the owners of capital. This would have an impact on the progressivity of the corporate income tax and on the overall results.

5.2 Federal effective spending results

In opposite to taxation, spending is said to be progressive when the effective rate of spending is higher for lower income deciles. It is said to be regressive when the effective rate is higher for higher income deciles and finally, it is described as proportional when the rate is more or less equal across all income deciles. Much like for taxation, federal effective spending is progressive, and this for both general allocator scenarios (Figure 6).

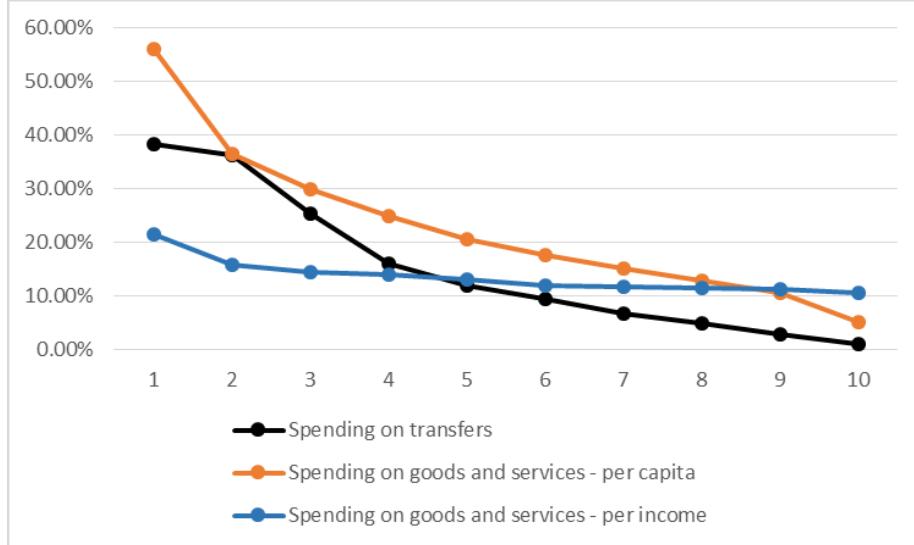
Figure 6 - Federal spending by general allocator scenario, per decile, 2007



Source: SPSD/M, CANSIM tables and calculations by the author.

As is shown in Figure 7, a portion of this progressivity comes from transfers and another from spending on goods and services. What is perhaps more interesting, however, is that depending on which general allocator used, per capita or per income, the intensity of progressivity will differ greatly. Indeed, the per capita scenario is very progressive whereas the per income scenario is only slightly progressive and can almost be described as being proportional. Not only does this emphasise the importance of careful and proper benefit allocations, but it will certainly influence the net federal fiscal incidence analysis.

Figure 7 - Federal spending by general allocator scenario and by category, per decile, 2007

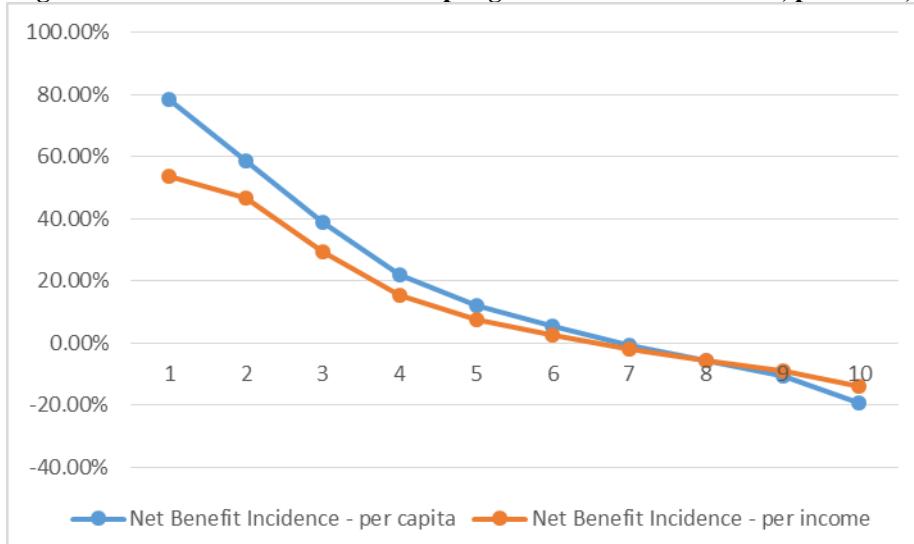


Source: SPSD/M, CANSIM tables and calculations by the author.

5.3 Net federal fiscal incidence

Subtracting the taxes from the amount of federal spending received, we calculate the net federal fiscal incidence for each decile. As can be expected from the previous results, the net fiscal incidence is strongly progressive.

Figure 8 - Net federal fiscal incidence per general allocator scenario, per decile, 2007



Source: SPSD/M, CANSIM tables and calculations by the author.

Once again, we see that the intensity of progressivity will vary depending on the general allocator scenario employed. In the general per capita allocator scenario, lower income deciles receive more benefit; the scenario is more progressive than the per income one. Although both outcomes are indeed progressive, the differences, especially for the first few deciles, once again highlights the importance of hypotheses and choosing appropriate allocators.

6 Factors influencing a households net benefit: regression analysis

Looking at the results per incomes deciles helps us establish that, on a whole, the federal fiscal system is progressive. This result is not surprising when we consider that Canada is a country that favours wealth redistribution.

But can one link these results to household characteristics other than income? To answer this, and to further identify what factors influence the amount of net federal benefits Canadian households receive, we perform a simple regression analysis.

6.1 Regression data and model

Our study looks at data for the 10 Canadian provinces for the 2007 fiscal year. Our unit of analysis is the household and our sample size is 88,732 households. Each household has a weight associated, which we take into consideration in our regressions. Our model is a simple OLS regression analysis that tries to answer the question of “What are the demographic characteristics that lead to the differences in net fiscal benefits among households?”. Because of the different general allocators used when distributing benefits per household, we have two measures for the dependant variable: net fiscal benefit per capita and net fiscal benefit per revenue. Consequently, we perform two different regressions. The base equation that we estimate is:

$$NFBen = \beta_0 + \beta_1 Rev + \beta_2 nf + \beta_3 pei + \beta_4 ns + \beta_5 nb + \beta_6 qc + \beta_8 man + \beta_9 sas + \beta_{10} alb + \beta_{11} bc + \beta_{12} nadult + \beta_{13} nadult^2 + \beta_{14} neld + \beta_{15} neld^2 + \beta_{16} nkids + \beta_{17} nkids^2 + \mu$$

Dependant variable

NFBen: Our dependant variable is a constructed variable that uses a combination of taxation, spending and allocator variables from the SPSD/M database (see section 2). It is a calculated by subtracting the federal taxes each household pays from the federal transfers and spending it receives. Because of the nature of some spending categories, we have two different scenarios: a general per capita allocator scenario (*NFBen_cap*) and a per income general allocator scenarios (*NFBen_inc*).

Independent variables

Rev: As part of our work, we employ the SPSD/M definition of revenue that includes all market revenues and government transfers. More precisely, this includes employment income, investment income, alimony income, taxable income and pension income. It also includes federal and provincial transfers to persons. From these revenues, we use the SPSD/M variable to subtract federal transfers. Our revenue variable is thus as we first described it but minus federal transfers.

Provincial binary variables: nf, pei, ns, nb, qc, man, sas, alb, bc: We include these variables in our regression to control for provincial variations in federal benefits that might affect how much net federal benefit each household receives. For example, we know that Quebec households will systematically receive less in spending benefits for education because students in Quebec do not have access to the federal student loans program. Moreover, the nature of economic activity, such as the seasonal work in the eastern provinces, will mean that certain provinces receive more Employment insurance benefits. As the most populous province, Ontario is our benchmark

province. Our analysis thus looks at how much being from a province other than Ontario, impacts the net fiscal benefits a household receives.

nadult: This variable is taken from the SPSD/M database and counts the number of adults over the age of 18 present in a household. We subtract from it the number of elderly (see neld).

nadult²: We construct this variable by squaring the nadult variable.

neld: This variable is taken from the SPSD/M database and counts the number of individuals over the age of 65 present in each household.

neld²: We construct this variable by squaring the neld variable.

nkids: This variable looks at the number of children present in each household. Children are individuals under the age of 18 years old. The data comes from the SPSD/M.

nkids²: We construct this variable by squaring the nkids variable.

6.2 Regression tests and results

The results for both general allocator scenarios are as follows:

Table 8 - Regression results by general allocator scenario, 2007

Regression results					
	Per capita scenario		Per income scenario		
R-squared	$R^2 = 0.8183$		$R^2 = 0.6796$		
NFBen	Coef.	P-Value	Coef.	P-Value	
rev	-0.28	0.000	-0.19	0.000	
nf	8,269.95	0.000	9,099.11	0.000	
pei	8,590.14	0.000	9,738.03	0.000	
ns	5,763.57	0.000	6,042.00	0.000	
nb	6,275.10	0.000	6,820.28	0.000	
qc	5,335.83	0.000	5,489.47	0.000	
man	4,840.85	0.000	5,316.94	0.000	
sas	4,645.16	0.000	4,777.85	0.000	
alb	-2,050.35	0.000	-2,351.70	0.000	
bc	18.33	0.914	-19.92	0.909	
nadult	5,832.20	0.000	3,154.75	0.000	
nadult2	160.95	0.374	-95.11	0.178	
neld	17,826.39	0.000	16,327.25	0.000	
neld2	-1,454.75	0.000	-1,652.81	0.000	
nkids	4,735.24	0.000	1,726.41	0.000	
nkids2	280.24	0.010	302.29	0.000	
_cons	-611.23	0.018	-537.06	0.049	

Source: calculations by the author.

The results from table 8 show that as compared to Ontario, and for all provinces except Alberta and British Columbia, there is a net federal fiscal benefit tied to a household's province of residence. The strongest positive effects are for households in the provinces of Prince-Edward-Island and Newfoundland. New Brunswick, Nova Scotia, and Quebec households benefit from the federal fiscal system, as compared to Ontario, slightly less than households from the first two previously mentioned provinces, but still more than households from Manitoba and Saskatchewan. Households in resource rich Alberta, perhaps not surprisingly, receive less net federal benefits than they would from living in Ontario. Finally, the variable BC is statistically insignificant which seems to indicate that households from British Columbia benefit from the federal tax system in a comparable manner to their Ontario counterparts.

As expected, the number of adults in a household will increase the amount of benefits for both general allocator scenarios. The interpretation for this in the per capita scenario is rather self-evident – more individuals means more benefits in spending and transfers. In the revenue scenario, this is probably due to the fact that more adults in a household probably lead to higher household income. Consequently, when we allocate benefits according to household revenue, households with more adults will receive higher benefits. The squared term, included to account for non-linearities, is insignificant for both scenarios.

The effect of the number of elderly individuals is positive and marginally decreasing. What this means is that though the presence of having elderly people will increase the amount of transfers, the increase will be slightly marginally decreasing. This slight decrease could be explained by the fact that the federal government provides many transfers to the elderly that are revenue contingent such as old age security. However the diminishing marginal effect is small enough that it seems unlikely to be of much significance.

The number of kids increases the amount of federal net benefits a household receives. Perhaps surprisingly, the marginal effect of having children is positive. One explanation could be that programs like the Child tax benefit, which provides a base amount for every child under 18 as well as an additional 100\$ for the third child and each additional child after that⁷, encourage families to have more children. However, it is highly unlikely to be the only explanation.

Finally, perhaps the most surprising result is not the effect of each regressor, but that the explanatory power of our model varies so widely depending upon which general allocator scenario we look at. In the per capita general allocator scenario, the independent variables seem to explain well the causes of federal net benefits received per household ($R^2 = 0.82$). However, when we look at the per income general allocator scenario, for the same independent variables, the explanatory power of our model greatly reduces ($R^2 = 0.68$). This only serves to reinforce the importance of allocative hypotheses when conducting incidence analyses. Moreover, it serves as a definitive *mise-en-garde* against policy makers who perhaps are tempted to draw strong conclusions from our results.

⁷ Canada revenue agency website, consulted August 5th 2013. http://www.cra-arc.gc.ca/bnfts/cctb/fq_pymnts-eng.html

7 Inter provincial results

We now turn to a brief inter-provincial analysis comparing provincial fiscal balances calculated using a macro methodology and provincial fiscal balances calculated using micro household data. Tables 9 and 10 present the key results for the per capita and per income general allocator scenarios respectively. The macro data is taken from CANSIM table 384-0004 and is adjusted to render the fiscal balances more comparable with our previously calculated micro household totals. To do this we simply subtract from the macro totals the direct taxes from non-residents (withholding taxes), the investment income, the current transfers from provincial governments and the surpluses/deficits⁸.

Table 9 - Federal fiscal balance, household and macro data, total and per capita, (per capita general allocator scenario), 2007

Province	Federal spending	Federal taxes	Fiscal balance	Fiscal balance per capita (\$)	Macro federal spending	Macro federal taxes	Macro fiscal balances	Macro fiscal balances per capita (\$)
Newfoundland and Labrador	5,143	2,975	2,169	4,272	7,105	2,561	4,544	8,951
Prince Edward Island	1,450	834	616	4,396	1,697	652	1,045	7,459
Nova Scotia	8,451	6,105	2,346	2,537	11,031	4,783	6,248	6,757
New Brunswick	6,944	4,422	2,522	3,433	7,610	3,471	4,139	5,634
Quebec	49,834	33,623	16,211	2,123	51,239	38,869	12,370	1,620
Ontario	81,462	103,738	-22,277	-1,743	79,378	89,883	-10,505	-822
Manitoba	9,556	7,622	1,934	1,746	11,351	6,101	5,250	4,741
Saskatchewan	6,839	5,643	1,195	1,282	8,372	5,947	2,425	2,602
Alberta	20,482	39,504	-19,022	-5,472	17,752	37,096	-19,344	-5,565
British Columbia	28,904	35,989	-7,085	-1,624	25,268	29,605	-4,337	-994
Total	219,064	240,454	-21,390	-656	220,803	218,968	1,835	56

Source: SPSD/M, CANSIM tables and calculations by the author.

⁸ Contributions and benefits received for the Canadian Pension Plan are included in the household micro fiscal balance but excluded in the macro fiscal balance. Adjusting for these differences, though not currently done, would further improve the comparability of the results.

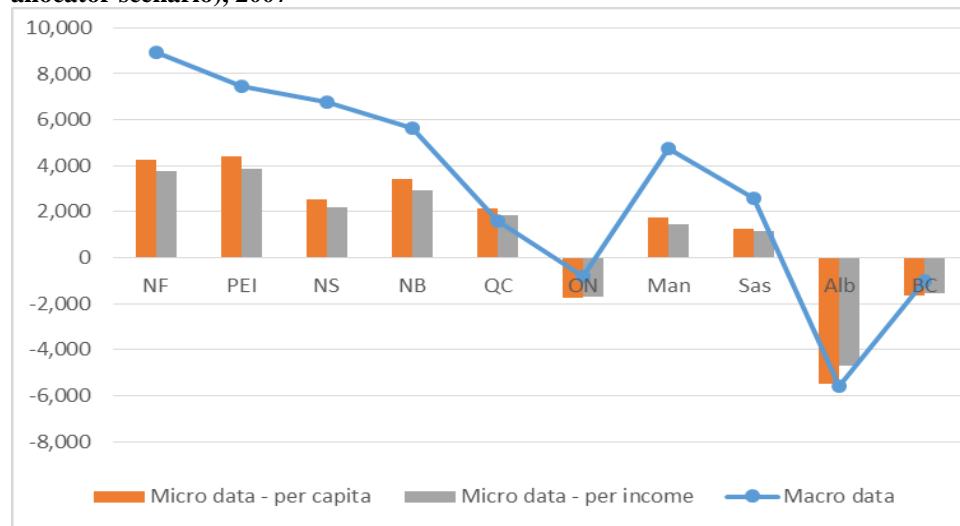
Table 10 - Federal fiscal balance, household and macro data, total and per capita, (per income general allocator scenario), 2007

Province	Federal spending	Federal taxes	Fiscal balance	Fiscal balance per capita (\$)	Macro federal spending	Macro federal taxes	Macro fiscal balances	Macro fiscal balances per capita (\$)
Newfoundland and Labrador	4,885	2,975	1,911	3,763	7,105	2,561	4,544	8,951
Prince Edward Island	1,374	834	541	3,859	1,697	652	1,045	7,459
Nova Scotia	8,154	6,105	2,049	2,216	11,031	4,783	6,248	6,757
New Brunswick	6,563	4,422	2,141	2,915	7,610	3,471	4,139	5,634
Quebec	47,620	33,623	13,997	1,833	51,239	38,869	12,370	1,620
Ontario	82,244	103,738	-21,494	-1,682	79,378	89,883	-10,505	-822
Manitoba	9,238	7,622	1,617	1,460	11,351	6,101	5,250	4,741
Saskatchewan	6,708	5,643	1,065	1,142	8,372	5,947	2,425	2,602
Alberta	23,132	39,504	-16,372	-4,710	17,752	37,096	-19,344	-5,565
British Columbia	29,144	35,989	-6,845	-1,569	25,268	29,605	-4,337	-994
Total	219,064	240,454	-21,390	-656	220,803	218,968	1,835	56

Source: SPSD/M, CANSIM tables and calculations by the author.

Figure 9 presents the per capita differences between the macro data and two micro data methods.

Figure 9 - Fiscal balances per capita differences using macro and household data (by general allocator scenario), 2007



Source: SPSD/M, CANSIM tables and calculations by the author.

As we can see, irrespective of method or general allocator hypotheses made, the province of Alberta, has a negative per capita fiscal balance. The methodology used has very little impact

for the provinces Ontario and British Columbia though the slight differences are enough to change the position of BC as having a slightly higher positive fiscal balance in the micro data method, to being slightly lower than Ontario in the macro data method. Similarly, using micro data, we find that, on a per capita basis, Quebec has a larger positive per capita fiscal balance than Manitoba and Saskatchewan. This result is reversed when we look at macro data. Moreover, the macro data method for these last two provinces indicates a much larger positive per capita fiscal balance than with the micro data.

Perhaps the most pronounced difference between micro and macro data methods, is when we look at the per capita fiscal balance of the eastern provinces. Specifically, the macro data, as compared to the micro data, seems to overstate the positive per capita fiscal balances for the provinces Newfoundland, Prince-Edward-Island, Nova Scotia and New Brunswick. Moreover, whereas when using micro data Prince-Edward-Island has the largest positive per capita fiscal balance, the largest positive balance belongs to Newfoundland when we employ the macro data method. Similarly, when we use micro data, Nova Scotia has a larger positive per capita fiscal balance than New Brunswick, which is exactly reversed using the macro data.

Overall, it would therefore seem that the choice between using micro data or macro data when calculating provinces' fiscal balances will have an impact on which provinces have the largest positive per capita fiscal balances. Additionally, for the eastern provinces and Manitoba, using per capita fiscal balance amounts are much larger than when using micro data.

8 Conclusion

“Who pays federal taxes” and “who benefits from spending”, are questions that many policy makers in Canada are constantly wondering. On the whole, we found that both the tax system and spending patterns are very progressive. We found that demographic characteristics such as number of elderly, adults and children, all have positive impacts on the amount of net federal fiscal benefits households receive. Moreover, we found that geographical regions also impact how much each household receives with the eastern provinces seeming to receive the most net federal benefits and Ontario, British-Columbia and Alberta the least.

However, caution must be used when trying to draw too strong conclusions from our results. Indeed, though the trends remain the same, depending on which general allocator scenarios we use, either per capita or per income, the influence of demographic and geographical factors not only change in strength but also in their explanatory power.

Our research further indicates that when looking at which provinces have the largest positive per capita fiscal balances, the general allocators does not change the order. What does, however, is the methodology used. Indeed, using micro or macro data when establishing provincial fiscal balances will change the order of which provinces have the largest positive balances. For the eastern provinces and Manitoba, the choice in methodology will be doubly important as the macro and micro data methods produce significantly different per capita fiscal balance amounts.

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Appendix 1: List of variables used

Variable	Description
Household Characteristics	
hdadult	Number of adults per household
hdeld	Number of elderly per household
hdnpers	Number of people per household
hdprov	The province of the household
hdwgth	Weight of the household
hdnkids	Number of children in household
idedlev	Highest level of education attained
idsex	Sex of individual
Idnage	Age of individual
Incomes of the household	
immtot	Total income
imftran	Federal transfer income
Income tax payable	
imtxf	Federal income tax payable
Consumption Taxes	
ctfcid	Federal custom import duties
ctfexd	Federal excise duties
ctfext	Federal excise taxes
ctfgst	Federal GST
ctfgsth	Federal GST on housing
imtxfc	Federal commodity taxes
n201*	Spending on luck games
Payroll Taxes	
imcqppc	CPP/QPP contributions
imuic	Unemployment insurance contributions
Federal Spending on Transfers	
imioas	Guaranteed income supplement
imispa	Spouse Allowance
imigis	Guaranteed Income Supplement Benefits
imiuib	Employment insurance
imfstc	Federal Sales tax credit
imfortc	Federal other refundable tax credits
imfcben	Federal child tax benefit
imiuccbr	Federal universal child care benefit received
imicqp	CPP/QPP benefits
imiosa	Other social assistance
imqtar	Quebec tax abatement
imiogt	Other taxable demigrants
imheatrl	Relief for heating expenses
imfecb	Energy cost benefit

Federal Spending on Goods and Services	
cttxfc30	Federal consumption tax : motor fuels and lubricants
k031*	Spending on public transport
k034*	Spending on long-distance transportation

Source : Statistics Canada's SPSD/M, * Household Spending Survey