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Commentary

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Following the Money

Federal and Provincial Budget Balances with Canada's Major Cities

Ronald D. Kneebone

In this issue...

Residents of Canada's major cities tend to pay far more in taxes than they receive in federal and provincial programs. Why?

The Study in Brief

Canada's nine major cities are engines of economic growth, accounting for about half of Canada's population and two-thirds of all net new jobs. How do federal and provincial fiscal policies affect them?

This *Commentary* describes and applies a methodology for allocating reported federal and provincial government spending and revenues on a sub-provincial basis, and provides results for nine major cities.

The amount Canadians pay in taxes and receive in government transfers and services is largely determined by our income, age, employment status and other such characteristics. The amount of revenue identified as having been collected by the federal government from citizens living in Vancouver, for example, reflects the characteristics of individuals and firms in that city. This fact allows the calculation of a "neutral benchmark" for the amounts federal and provincial governments spend and collect by way of revenue in major cities.

The study finds that the major cities' residents, for the most part, pay more in taxes than they receive in programs: a result neither unusual nor unexpected. These imbalances reflect the influence of a progressive tax system and the design of government programs that transfer income to the aged and the disadvantaged.

There are significant differences across cities. In 2002, for example, the average citizen of Calgary paid $3,082 more in federal taxes than he or she received by way of federal transfers and services. For the average citizen of Toronto, the figure was $2,113 and for the average citizen of Montreal it was essentially zero.

The findings have two important implications:

- It may benefit governments to appreciate how a fiscal measure may have detrimental impacts on the centres of economic activity responsible for generating most of Canada's wealth. If the design of taxes and spending programs matter for economic growth, and if their impact is felt across regions of the country in a way detrimental to economic growth in some regions, then the trade-off between economic efficiency and equity, which all policymakers must face, may need to be considered along the regional as well as the personal dimension.
- The findings may help explain a government's preference for one fiscal measure over another, since it may be that a given choice differentially affects the fiscal balance in an urban constituency from which it seeks greater political support.

The Author of This Issue

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Large cities are frequently described as the "engines of economic growth" within a national economy. The reason: major cities are magnets for immigrants, new industries, the highly educated, and the highly skilled. In 2002, 90 percent of all international immigrants settled in one of Canada's nine major cities.[1] Forty-six percent of those immigrants held a bachelor's, master's, or doctoral degree; this compares to the Canadian average of 16 percent.[2] Over the period 1996–2002, Canada's nine largest cities contained 51 percent of Canada's population but were home to 65 percent of all net new jobs created in the country. Over the same period, by comparison, medium-sized cities accounted for an average of 9 percent of the population and 8 percent of new employment, while small-sized cities and other urban areas accounted for 20 percent of the population but less than 13 percent of new employment. Rural areas, while accounting for over 20 percent of the population, contributed only 15 percent of the new jobs created in Canada over that period.[3] Canada's major cities, then, hit well above their weight when it comes to creating new employment.

A timely question, certainly for big city mayors and their constituents, is whether the fiscal policies of the provincial and federal levels of government take into account the vital role of big cities as engines of economic growth. Do cities give (in taxes) more than they get (in various government spending programs)? If so, is this unfair and a reason for complaint?

Governments, via their tax policies and the design and size of their spending programs, are generally considered to have an effect on economic growth. Whether the effect is positive or negative depends on the size and the design of government spending and revenue programs. Given the potential role of government budget policies to affect, for good or ill, the engines of economic growth, it would be useful to have data on how much revenues governments collect and how much governments spend in major cities.

In Canada, however, detailed information on how federal and provincial government revenues and expenditures are distributed across the country is available only at the provincial level. While Statistics Canada reports detailed data on federal government finances by province, there is no further geographical breakdown within each province. Statistics Canada similarly reports provincial government spending and revenues only at the aggregate provincial level and not by sub-provincial regions or population centres.

Drilling Deeper: This paper describes and applies a methodology that allows one to allocate the amounts of federal and provincial government spending and revenues

I owe thanks to Donna Waagenaar and Kate White for valuable research assistance and to Craig Brett, Finn Poschmann, and Bill Robson for helpful comments. I remain responsible for any errors or omissions.

1 Citizenship and Immigration Canada (2002). The nine major cities are Toronto, Montreal, Vancouver, Ottawa-Gatineau, Calgary, Edmonton, Quebec, Hamilton, and Winnipeg.

2 Data on education attainment of international immigrants are from Citizenship and Immigration Canada (2002). Data on the average education attainment of all Canadians are from CANSIM II Table 2820004.

3 Population and employment by region are from CANSIM II Table 2820066.

that Statistics Canada reports for provinces to sub-provincial areas.

The method is based on the fact that government spending and revenue collection are determined by the characteristics of individuals, firms, and regions. For example, high-income individuals pay more in income tax than low-income individuals, while public pension eligibility is dependent on age, and healthcare spending varies with age. Thus, we can infer the location of provincial and federal government spending and revenue collection efforts from the income, age, and other characteristics of populations and industries within sub-provincial areas. For example, knowing what fraction of Toronto's population is aged 65 years or older, and comparing this to the fraction of Ontario's population aged 65 years or older, one can infer what portion of province-wide spending on public pensions goes to recipients living in Toronto.

The assumption implicit in this approach is that federal and provincial government revenue collection and spending mechanisms work in an impartial way that ignores city boundaries. The amount of revenue identified as having been collected by the federal government from citizens living in Vancouver, for example, will reflect the characteristics of individuals and firms in that city. If this amount is found to be large, it is because the age, income and other characteristics of the individuals and firms are such that an impartial application of federal tax legislation causes them to pay large amounts of tax. The result of this exercise, then, will be to produce estimates of what one might call a "neutral benchmark" of the amounts federal and provincial governments spend and collect by way of revenue in major cities.

The Limits and Purposes of the Study's Estimates: It is important to stress that the exercise provides estimated, rather than observed and recorded inflows and outflows of government revenues. Straightforward measures do not exist of the amounts federal and provincial governments collect by way of revenue and spend in cities. My neutral benchmark, therefore, cannot take into account such items as one-off spending programs in particular cities, or special tax allowances for certain regional industries, etc. Yet, it would only be by comparing my estimates of a neutral benchmark against such observed amounts that any claim of unfair treatment of a city by the federal or provincial government could possibly be made. Since such a comparison cannot be done, no claims of "unfairness" can be made on the basis of these estimates alone.

To what purposes can these estimates be put? One is to illustrate to those who point to fiscal imbalances as evidence of unfairness that such claims are not necessarily warranted. As stressed by Kneebone (2005) and Poschmann (2005) in reference to the debate over fiscal imbalances at the provincial level, in making tax collection and spending sensitive to income, demographic, and other characteristics of individuals, firms, and regions, governments must inevitably cause certain regions within their jurisdiction to pay relatively more in taxes and/or receive relatively less by way of government-provided goods and services.

Such imbalances are neither unusual nor unexpected. To a large extent, they reflect the influence of a progressive tax system and the design of government programs that transfer income to the aged and the disadvantaged. As a result, they are difficult to criticize without finding fault with these transfer programs. This point is worth emphasizing to provincial premiers with respect to federal

fiscal imbalances with provinces and it is worth emphasizing to mayors with respect to federal and provincial imbalances with cities.

A second purpose to which these estimates can be put is to draw attention to the spatial aspect of federal and provincial revenue collection and spending. While a good deal of attention has been paid to how federal spending and revenue collection varies across provinces, few attempts have been made to drill down deeper to the level of cities.[4] If the design of a government's tax and expenditure program causes a persistent net imbalance, then the resulting regional fiscal stimuli, either positive or negative, should be recognized as a by-product of those elements of tax and expenditure design aimed at redistributing income, addressing age-related concerns, and efforts to balance provincial government spending capacities via equalization.

If the design of tax regimes and spending programs matter for economic growth and if their impact is felt across regions of the country in a way detrimental to economic growth in some regions, then the trade-off between efficiency and equity that all policymakers must balance may need to be considered along the regional as well as the personal dimension. While recognizing the estimates generated in this study are only measures of a neutral benchmark and not measures of actual fiscal balances, they nonetheless provide insight into the potential for redistributive fiscal policies to have implications for regional economic growth.

A third purpose to which these estimates might be put is to consider them for their possible explanatory power in the political sphere. The existence of a concentration of net fiscal inflow into one region of the country and a corresponding fiscal outflow from another might explain why politicians could favour changes to tax or spending policies that either reinforce or mitigate such imbalances. Some analysts have suggested, for example, that the first two budgets of the Harper government contained measures designed to lessen the fiscal burden borne by those taxpayers living in the major cities; a constituency from which that government received relatively little support in the 2006 federal election.[5] The neutral benchmark derived here provides insight into how changes in legislation might be used by federal and provincial governments to favour taxpayers in large cities as opposed to other sub-provincial regions.

A Focus on Nine Major Cities: The focus of this paper will be on the derivation of measures of federal and provincial government budget balances in Canada's nine major cities. From largest to smallest these are Toronto, Montreal, Vancouver, Calgary, Edmonton, Ottawa, Winnipeg, Quebec City, and Hamilton.[6] In Section 2

4 Exceptions include Mullins (2004) who limits his attention to sub-provincial areas in Ontario, Toronto Board of Trade (2002), which concentrates on Toronto, and K & L Consulting (2004), which limits attention to Calgary.

5 These are often identified as the introduction of the Canada Employment and the Children's Fitness Tax Credits, the reduction in the Right of Permanent Residence Fee, a new tax credit for monthly transit passes, and the $100 per month child-care payment.

6 As I discuss in greater detail below, I make use of the availability of city-specific data on income and age distributions, employment, social assistance and unemployment insurance recipients, etc, to allocate federal and provincial revenues and spending to these nine large cities. Almost all of these data are available only for the metropolitan area of Ottawa-Gatineau, which spans ....

of the paper I provide the methodological details behind the calculations. Section 3 summarizes the results for each of the nine cities and strives to show how the calculations are affected by the income and demographic distributions of their populations. Finally, in Section 4, I discuss the meaning of the calculations and how they should be, and how they should not be, interpreted.

Highlights of The Major Findings for Cities: Based on the characteristics of city-dwellers and firms in large cities, governments will tend to collect more in revenue and spend less on government programs in the nine large cities than elsewhere. This is confirmed by estimates compiled for the period under study, 1986–2002. Among the highlights:

- In 2002, the federal government realized a $23.464 billion surplus with the nine large cities and a $14.494 billion deficit with the rest of the country. In those years when the federal government was running large deficits nationally (1986–1995), those deficits were relatively small in the nine major cities and particularly large in the rest of the country.
- In 2002, the 10 provincial governments ran a budget deficit of $12.013 billion. Of this amount, only $1.459 billion was realized in the nine large cities, while the rest ($10.554 billion) realized in the rest of the country.
- Looking at Ontario cities during the period 1986–2002, and making adjustments for federal deficits, residents of Toronto paid an average $2,285 more in federal taxes per capita than they received by way of federal services and transfers each year. Ottawa residents paid $1,986 more in federal taxes than they received in federal programs. Hamiltonians paid $1,816 more per capita than they received.
- Citizens of Calgary paid $2,223 more in federal tax revenue per capita than received in federal programs each year during the 1986–2002 period. Edmontonians paid $1,915 more per capita than they received.
- Citizens of Vancouver paid $918 more in federal taxes per capita each year during the period than they received.
- By comparison, the federal government collected $2,007 less per capita than it spent in Winnipeg, collected $736 less in tax revenue than it spent in Montreal, and collected $373 less in tax revenue than it spent in Quebec City.
- On average during the period 1986–2002, and adjusting for provincial deficits, all nine major cities paid more in taxes to provincial governments than they received in provincial spending.

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footnote 6 cont'd

.... the Ontario-Quebec border. This is problematic since the federal and provincial government data I am seeking to allocate to cities is reported on a provincial basis. To handle this problem, I assume that 76 percent of the population of Ottawa-Gatineau is located on the Ontario side of the provincial border. This is based on census data from 2001. I further assume that the income, demographic, and other characteristics of the metropolitan area of Ottawa-Gatineau are also representative of these characteristics for just the Ontario part of that metropolitan area; Ottawa. The ranking of cities by size reflects the population of Ottawa as 76 percent of the population of Ottawa-Gatineau.

The Methodology:

Statistics Canada provides time-consistent data describing the amounts of tax collected, and the levels of spending on government-provided goods and services provided, by each of the federal, provincial and local levels of government in each province.[7] Table 1 identifies, for the federal and provincial governments, the categories of revenue and expenditure data that are available.

Unfortunately, these data are not further disaggregated to show the amount of revenue collected from, and the level of government-provided goods and services provided to, citizens of each city within each province. However, Statistics Canada does publish data describing for each of Canada's nine largest cities the distribution of income, the age distribution of the population, and the state of the local economy as measured by the number of citizens collecting Employment Insurance, social assistance, and other types of income support. Using this information, it is possible to infer what portion of province-wide federal and provincial government revenue and spending is paid by and received by the citizens of each of those nine cities. In what follows I describe in more detail how the provincial and federal government revenue and spending categories identified in Table 1 are allocated to each of the nine cities.

Revenues

Taxes on Individuals: Most taxes paid by individuals depend on income. For that reason, the amount of tax revenue collected from a region depends on the distribution of income within that region as well as on the number of people living in that region. This is so because many tax rates are progressive in the sense that high-income earners are subject to a larger average tax rate than low-income earners. This is particularly true of *Direct Taxes from Persons* such as the personal income tax. To determine the fraction of all direct taxes paid in a province that is paid by those living in a particular city in that province we need a measure of the distribution of income in the city and in the province. Statistics Canada reports the average income tax paid by taxpayers in each province by income quintiles (CANSIM II Table 2020501). While that information is not available for individual cities, Statistics Canada does report the distribution of earned income by city and by province for 11 income ranges (Table 2020101). By grouping adjacent income ranges so that they approximate quintiles we can obtain a measure of the fraction of all income earners in each province and city reporting incomes in the lowest to highest quintiles. Knowing the fraction of all provincial income earners in each quintile who live in each city, and knowing the fraction of all income tax paid by

7 The statistical universe of the Canadian government sector can be defined in different ways. In this study, I focus on what Statistics Canada defines as the federal, provincial and local levels of government. This means I include the budgets of non-autonomous pension plans of each level of government (the pension plans they maintain for their employees), the budgets of universities and colleges, health and social service institutions in provincial budgets, and the budgets of school boards in local government budgets. Excluded from consideration are the budget of the Canada Pension Plan and the budgets of government business enterprises.

Table 1: *Federal and Provincial Government Revenues and Expenditures by Category*

Federal Government Revenues and Expenditures	Provincial Government Revenues and Expenditures
Total Revenue	**Total Revenue**
Direct Taxes from Persons	Direct Taxes from Persons
Direct Taxes from Corporate & Government Business Enterprise	Direct Taxes from Corporate & Government Business Enterprise
Direct Taxes from Non-Residents (withholding taxes)	Contributions to Social Insurance Plans
Contributions to Social Insurance Plans	Indirect Taxes
Indirect Taxes	Amusement Tax
Customs Import Duties	Corporation Tax (not on profits)
Excise Duties	Gasoline Tax
Excise Taxes & Miscellaneous Indirect Taxes	Motor Vehicle Licences & Permits
Air Transportation Tax	Other Licences, Fees & Permits
Other	Miscellaneous Taxes on Natural Resources
Other Current Transfers from Persons	Real Property Tax
Investment Income	Retail Sales Tax (includes Liquor & Tobacco)
Current Transfers from Provincial Governments	Profits of Liquor Commissions
– Total Current Expenditure	Gaming Profits
Net Current Expenditures on Goods & Services	Payroll Taxes
Current Transfers to Persons	Miscellaneous
Family and Youth Allowances	Investment Income
Child Tax Benefit/Credit	Current Transfers from Federal Government
Pensions, WWI and WWII	Current Transfers from Local Governments
War Veteran's Allowances	**– Total Current Expenditure**
Grants to Aboriginal Persons & Organizations	Net Current Expenditures on Goods & Services
Goods and Services Tax Credit	Current Transfers to Persons
Employment Insurance Benefits	Worker's Compensation Benefits
Old Age Security Payments	Grants to Benevolent Associations
Scholarships & Research Grants	Social Assistance — Income Maintenance
Miscellaneous and Other	Social Assistance — Other
Current Transfers to Business	Miscellaneous
Agricultural	Current Transfers to Business
Other	Current Transfers to Federal Government
Current Transfers to Provincial Government	Current Transfers to Local Governments
Contributions to Crop Insurance Act	Interest on Public Debt
To Provincial Universities	**= Saving**
Current Transfers to Local Governments	+ Capital Consumption Allowances
Interest on Public Debt	+ Net Capital Transfers
= Saving	- Acquisition of Non-Financial Capital
+ Capital Consumption Allowances	**= Net Lending (Surplus (+) or Deficit (-))**
+ Net Capital Transfers	
- Acquisition of Non-Financial Capital	
= Net Lending (Surplus (+) or Deficit (-))	

Source: Statistics Canada CANSIM II Tables 384004, 3840007, 3840009, 3840010, and 3840011.

provincial taxpayers in each quintile,[8] we obtain a calculation of the fraction of all income taxes paid in each province by citizens in each city.[9]

While *Indirect Taxes* are not progressive in the sense that high-income earners pay a higher tax rate than low-income earners, the amount of indirect tax revenue collected in a region is nonetheless sensitive to both the average income in the region and the distribution of income in the region. High-income earners, for example, likely purchase more gasoline (both because they are more likely to own a vehicle and because they are more likely to own a larger, less fuel-efficient vehicle) than low-income earners and hence pay more gasoline tax. For this reason, indirect taxes are identified as being paid by those living in a particular city in proportion to a measure that takes into account how the distribution of incomes in that city differs from that in the province as a whole. In particular, I assume that city taxpayers pay the same fraction of all indirect taxes paid in the province as they pay of all direct taxes.

This same measure is used to allocate to city taxpayers *Contributions to Social Insurance Plans*.[10] This is appropriate since such payments also vary with income and with income distribution. They vary with income distribution because they are subject to a maximum contribution that is binding at a moderate-income level. The greater the number of high-income earners, the greater the number of those paying the maximum contribution and the more taxes collected from a region via this source. *Other Current Transfers from Persons* are allocated in the same way.

Taxes on Corporations: I assume that high value-added corporations employ high-income earners and so I allocate *Direct Taxes from Corporate & Government Business Enterprise* to the location where high-income earners live, and presumably to the location at which the lion's share of value added occurs. The share of all corporate taxes paid in a province is allocated to cities according to provincial share of high-income earners (those earning $60,000 or more) living in that city.

Investment Income: Governments earn income from financial assets they own and

8 To obtain approximate income quintiles for each city, I grouped the first two income ranges (<$5,000 and $5,000-$9,999), the third and fourth income ranges ($10,000-$14,999 plus $15,000-$19,999), the fifth, sixth, and seventh income ranges ($20,000-$24,999 plus $25,000-$29,999 plus $30,000-$34,999), the eight and ninth income ranges ($35,000-$39,999 plus $40,000-$44,999), and the tenth and eleventh income ranges ($50,000-$64,999 plus >$60,000). Averaging over all nine cities over the entire period for which these data are available (1980–2003), these groupings gathered city populations into quintiles comprising 24, 16, 22, 17, and 21 percent of total city populations.

9 An alternative approach, recently employed in IMF (2003), is to rely on information provided by the Canada Revenue Agency (CRA) on personal taxes paid according to the age and sex of tax-filers. Unfortunately, this age-sex breakdown is available only for federal and provincial income taxes in aggregate and only for Canada as a whole. As my goal is to allocate federal and provincial revenues to each city separately, these aggregate data are not useful. These data are also available for only five years (1998–2002), which limits their usefulness for identifying longer-term trends in how the federal and each provincial government allocate their budgets across sub-provincial regions.

10 This revenue category includes contributions to Workers' Compensation Boards, Employment Insurance contributions, and contributions to non-autonomous pension plans.

Statistics Canada identifies the income earned on those assets.[11] I assume that government assets are owned equally by all citizens. Consequently, when the government chooses to keep that investment income rather than distribute it to the owners of the assets (citizens), it is equivalent to imposing a head tax on each citizen. Thus *Investment Income* is allocated to each city in proportion to that city's share of the province's population.

Transfers Received from Other Levels of Government: The transfer received by one level of government from another is paid for out of the tax revenue collected by the granting government. I assume citizens of any city pay the taxes used to finance these transfers in proportion to the amount of income tax they pay.

Expenditures

Net Current Expenditure on Goods and Services: At the provincial government level, net current expenditure on goods and services is driven by wages, salaries, and capital outlays related to healthcare, education, environmental protection, policing, development, housing, recreation, and general government. The importance of spending on providing health and education suggests that provincial government net current expenditures on goods and services ought to be reasonably well determined by demographic variables. To investigate this conjecture, I estimated a fixed-effects pooled regression of real per capita spending on goods and services against variables measuring its own value lagged one period and the proportions of the provincial populations aged 15-29 years, 30-44 years, 45-64 years, 65-74 years, and 75 years and older.[12] In the regressions, the proportion of the provincial population aged 75 years and over was found to be the largest of the estimated coefficients on the demographic variables. This most likely reflects the impact on provincial healthcare spending of increases in the size of that demographic group; a conjecture supported by the evidence reported by Di Matteo (2004). The 0-14 and 15-29 age groups exerted the next largest influences on net current expenditures.[13] In general, the influence of age on net current expenditures follows a U-shape with spending higher for young and old and lower for those in between. Using the estimated coefficients from these regressions and data on demographic variables for each of the nine cities, I produce estimates of provincial government real per capita spending on goods and services for each city. Multiplying by city population and the price index yielded nominal values of provincial government spending in each of the nine cities.

The same approach was employed to allocate federal government spending on goods and services. Since at the federal level, spending on health and education

11 In government financial accounts the royalty incomes earned on non-renewable natural resources is treated as a return on investment. Non-renewable natural resources are, thus, treated as capital assets.

12 The influence of the 0-14 age group is captured by the constant and fixed effects terms. Regression results are available on request.

13 Di Matteo (2004) also reports that younger age groups exert positive influences on provincial healthcare spending. In his study these influences are smaller than those found in my regressions. This is to be expected since my regressions include the influence of demographics on not only healthcare expenditures but also provincial expenditures on basic and advanced education, police, recreation, housing, and other categories of current expenditures.

occurs via transfers to the provinces and not via net current expenditures on goods and services it is not surprising to find that spending is less sensitive to demographic variables. Though the proportion of the population aged 75 years and over had the largest influence on federal net current expenditures the difference in influence on spending across age groups was smaller here than on provincial spending.

Current Transfers to Persons: Statistics Canada identifies 10 types of current transfers to persons by the federal government and five types by the provincial government. Statistics Canada also reports, in Table 2020404, the number of recipients in the nine cities and in each province of various types of government transfers. The proportion of provincial recipients living in each city is used to allocate the following government transfers to that city: from the federal government, *Old Age Security and Guaranteed Income Supplement payments*, the *Child Tax Benefit/Credit*, the *GST Credit*, and *Employment Insurance Benefits* and from the provincial government, *Social Assistance*.[14] The remaining types of government transfers are allocated to cities in the following ways. Federal government transfers in the form of *Family and Youth Allowances* are allocated to cities in proportion to each city's share of the provincial population aged 0-14 years. Federal government transfers in the form of *WWI and WWII Pension*s, and *War Veteran's Allowances* are allocated to cities in proportion to the city's share of the provincial population aged 75 years and older and the city's share of the provincial population aged 65 years and older, respectively. Federal *Grants to Aboriginal Persons & Organizations* are allocated to cities in proportion to the city's share of the aboriginal population in the province,[15] while federal *Scholarships & Research Grants* and *Miscellaneous and Other* transfers are allocated to cities in proportion to the city's share of provincial population. Finally, provincial government transfers to persons in the form of *Grants to Benevolent Associations* and *Miscellaneous* transfers are allocated by population while *Worker's Compensation Benefits* are allocated in proportion to the city's share of provincial employment.[16]

Current Transfers to Business: I assume a city's share of these transfers is

14 This data source also presents data on the number of recipients of *Workers Compensation Benefits* by city, suggesting that this too could be allocated by the proportion of provincial recipients living in each city. However, these data are available from 1993 only. For that reason, I use an alternative allocator, based on employment, as described below. It is worth noting that I treat all those receiving federal and provincial transfers as receiving the same dollar amount. Data on the distribution of income amongst those aged 65 and over might allow for a more precise allocation of seniors' benefits because the Guaranteed Income Supplement is particularly sensitive to income. Allocations of the other categories of transfers would be less sensitive to this refinement as they are less sensitive to income.

15 Data on aboriginal population by province and by sub-provincial regions are taken from the 1996 census of population (see CANSIM Table 1090100). I assume the share of aboriginals in city populations remained constant throughout my sample period.

16 It is worth noting that payments to government employees from non-autonomous pension plans, which are included in the federal and provincial *Miscellaneous* transfers categories, are treated as a transfer like any other. An alternative interpretation is that such pension transfers are part of employees' compensation, in which case they would be classified as a net current expenditure on goods and services. These payments are, however, a small proportion of total transfers to persons and an even smaller fraction of net current expenditures on goods and services. A reallocation across these categories would, therefore, have very little impact on the calculations.

proportional to that city's share of the value of all business income generated in the province. This, in turn, is assumed to be proportional to the city's share of provincial employment. An exception to this rule occurs at the federal government level where *Current Transfers to Business — Agricultural* are not allocated to cities.

Government Transfers to Other Levels of Government: Most of the transfers one level of government makes to another are conditional on population. Thus, the Canada Health and Social Transfer (CHST) paid by the federal government to provincial governments is a per capita transfer. Similarly, the size of transfers from the provincial government to local governments is typically related to the population of the region governed by the local government. A city's share of *Current Transfers to Provincial Governments* (from the federal government), as well as *Current Transfers to Federal Government* and *Current Transfers to Local Government* (both from the provincial government) are therefore assumed to be proportional to that city's share of the province's population. There are two exceptions to this rule. At the federal government level, those transfers to provincial governments due to the *Crop Insurance Act* are not allocated to cities. Federal *Transfers To Provincial Universities* are allocated to cities in proportion to the percentage of the university student population in a province attending a university (or universities) located in a city. Data on university enrolments come from the Association of Universities and Colleges of Canada (www.aucc.ca).

Interest on Public Debt: Governments are obligated to pay interest on the debt they incur. The amount of interest payments flowing to a city reflects the amount of each government's debt held by citizens of that city. I assume that the amount of government debt held rises with income. Thus *Interest on Public Debt* is assumed to accrue to citizens of a city in an amount proportional to that city's share of those in the province earning $60,000 or better.

Government Saving

A government's saving is given by what it collects in tax revenue, what it receives in the form of transfers and what it earns in investment income, minus its expenditures on goods, services, transfers and interest. Savings are used to finance *Capital Consumption Allowances* and the *Acquisition of Non-Financial Capital*. I assume that these expenditures accrue to cities in proportion to the city's share of the provincial population. After accounting for *Capital Consumption Allowances* and the *Acquisition of Non-Financial Capital*, we are left with the Net Lending of the government. This is also known as the government's surplus (if the value is positive) or deficit (if its value is negative). Net Lending is calculated as a residual for each sub-provincial region. It identifies the net fiscal position of the sub-provincial region with the provincial or federal government.

The Results

The allocation of federal and provincial government spending in a province to the sub-provincial level relies on five key characteristics of sub-provincial areas: income distribution; age distribution; population; employment; and the dependence on social transfers in the form of social assistance, tax credits and

Employment Insurance. Averaging over the nine major cities, 32 percent of federal government expenditure was allocated on the basis of city-specific data on income distribution, 22 percent on the basis of city-specific data on age distribution, and 24 percent on the basis of city-specific data on social assistance recipients. The rest was allocated mainly on the basis of the city's share of provincial population (19 percent) with smaller adjustments due to the city's share of provincial employment, university enrolment, and aboriginal population.[17] The corresponding figures for provincial government expenditures are 15 percent for income distribution, 50 percent for age distribution, 5 percent on the basis of social assistance and EI recipients, 24 percent on the basis of population, and 6 percent on the basis of employment. Interestingly then, a city's income distribution affects the amount of federal expenditures allocated to that city more than does its age distribution while the opposite is true for provincial budgets. The sensitivity of provincial budgets to the age distribution stems mainly from the importance of healthcare and education spending in provincial budgets. On the revenue side, city-specific data on income distribution plays the key role in determining the amount of revenue collected in a city: 95 percent of federal revenues were allocated on the basis of a city's income distribution while 89 percent of provincial revenues were so allocated. The rest was allocated on a per capita basis. In general then, a city's income distribution will be the largest single determinant of how much of the provincial deficit, and how much of the federal government's deficit with the city's province, is allocated to that city. Calculations supporting this conjecture are provided below.

The Nine Major Cities in Aggregate

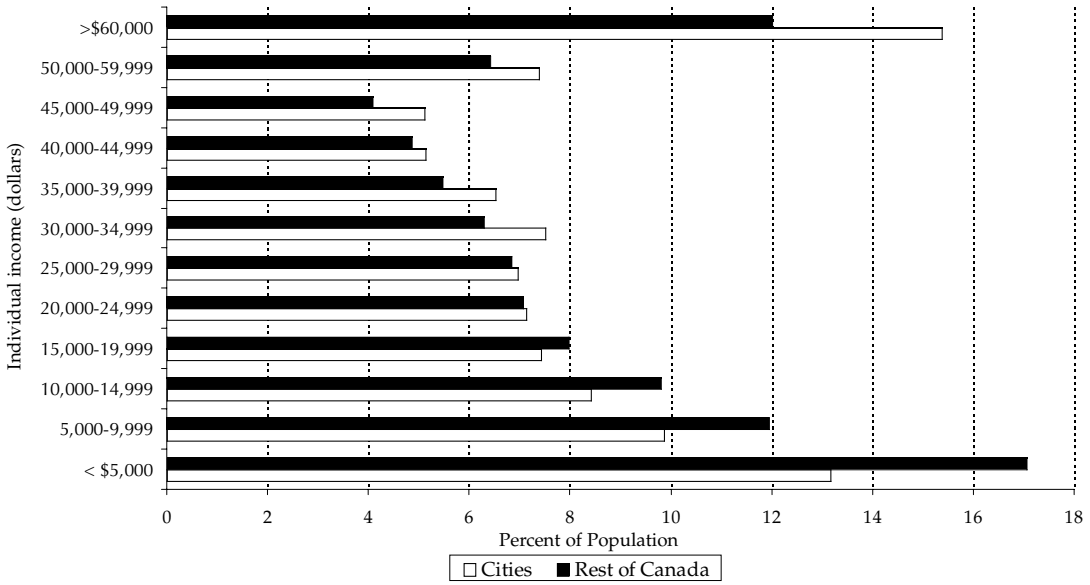
The discussion of Section 2 suggests that any government's spending and revenue collection in a particular city will depend on the demographic and income characteristics of that city. Figures 1 and 2 compare income and age distributions in the nine large cities versus in the rest of the country for 2002.

Figure 1 shows that the percentage of the population in the nine large cities earning low incomes is considerably smaller than in the rest of the country and the percentage earning mid to high incomes is considerably larger. As a consequence, income-dependent government spending will be lower and income-sensitive tax revenue will be higher in the nine cities than in the rest of the country. Particularly important here is the difference in the percentage of people earning high incomes. In 2003, across the five provinces containing large cities, 58.6 percent of all personal income tax revenue was collected from those in the highest income quintile. This compares to the 1.4 percent of all personal income tax paid by those in the lowest income quintile, 5.1 percent in the second quintile, 12.1 percent in the third, and 22.8 percent in the fourth.[18] The share of income tax paid by the highest

17 The share of university enrolment affected only the allocation of federal expenditures, in the form of transfers to universities, to cities. This adjustment affected an average of less than 1 percent of federal expenditures.

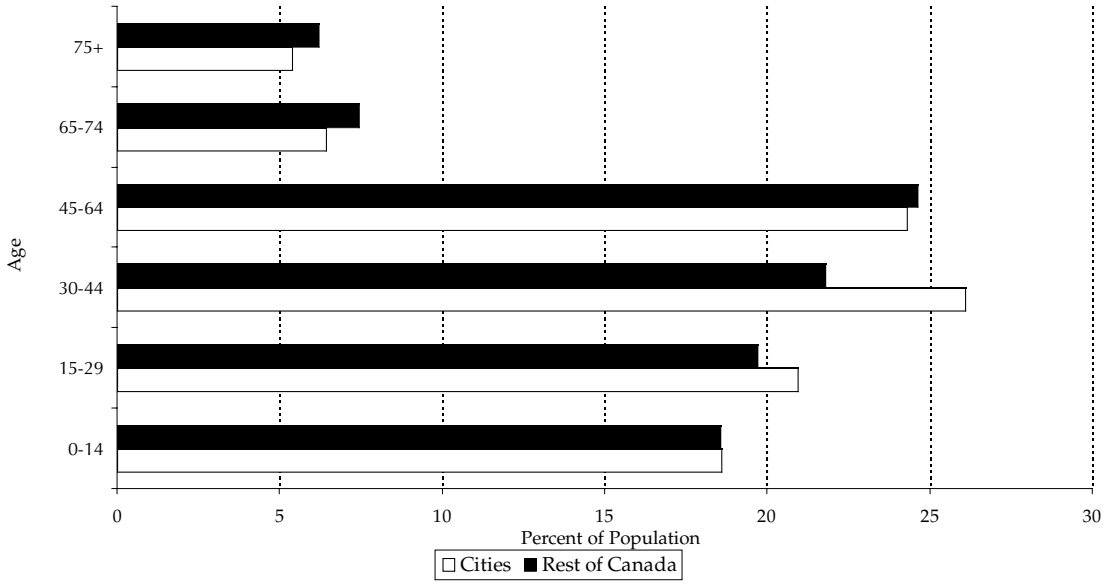
18 The tax burden increases even within the top income quintile. See, for example, Martineau (2005) who reports that for Canada as a whole, the top decile of tax filers paid 52.6 percent of federal income taxes in 2002.

Figure 1: *Income Distribution, Nine Major Cities and the Rest of Canada, 2002*



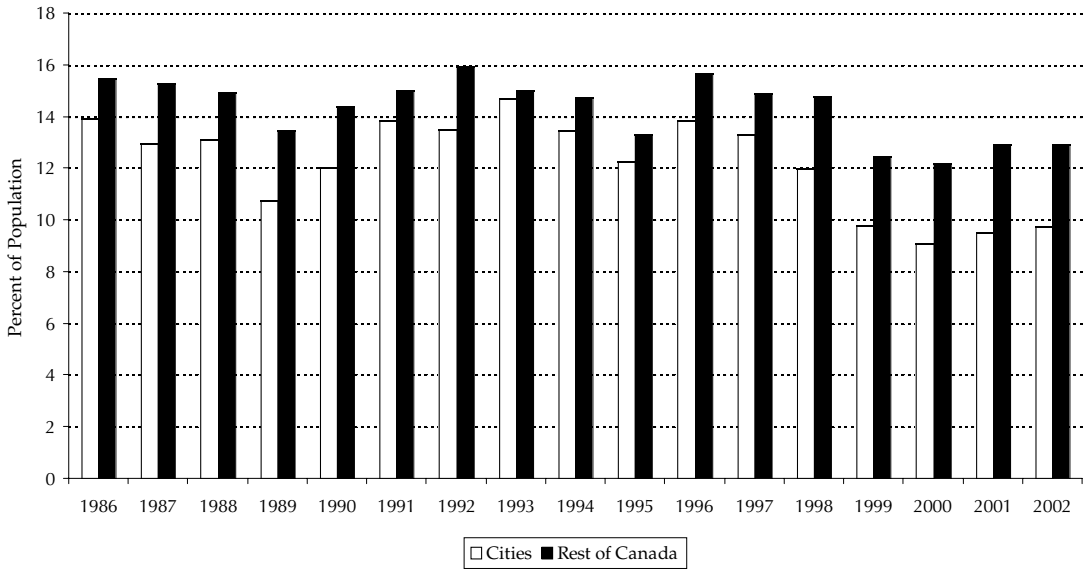
Source: CANSIM II Table 2020101.

Figure 2: *Age Distributions, Nine Major Cities and the Rest of Canada, 2002*



Source: CANSIM II Tables 510001 and 510016.

Figure 3: *Social Assistance and EI Rates, Nine Major Cities and the Rest of Canada*



Source: CANSIM II Table 2020404.

quintile has increased over time with the result that the relative tax burden of taxpayers in large cities has also increased over time. Thus, across the five provinces containing major cities, the top quintile of income earners paid 50.8 percent of all income taxes in 1980, 53.6 percent in 1990 and 58.6 percent in 2003.

Figure 2 shows that the percentage of the population in the nine large cities aged 45 years and above is lower than in the rest of the country, while the percentage aged less than 45 years, particularly those aged 30-44 years, is higher. As a result of having relatively fewer of those aged 65 years and above, cities will receive less by way of age-dependent transfers than will areas outside the major cities. This influence is compounded by the fact that, as noted earlier, the 65 years and over age group is associated with higher levels of net current expenditures. On the other hand and as noted earlier, the younger age groups (particularly the 15-29 age group) is relatively large in cities and exert a positive influence on net current expenditures. Given these offsetting influences, their age distribution is unlikely to have as large an impact on the amounts expended in cities by federal and provincial governments as their income distribution.

Figure 3 compares the percentage of the population collecting social assistance or employment insurance (EI) in the nine large cities versus the rest of the country. The nine large cities consistently enjoy the benefits of a lower percentage of their populations collecting social assistance or unemployment insurance than the rest of the country. The implication for fiscal balances, however, is that the nine large cities receive relatively smaller amounts of government expenditure in the form of income-support.

Table 2: *Federal and Provincial Government Deficits by Region, 1986–2002*

	Federal Government Deficit with:			Provincial Government Deficit with:		
	Nine Cities	Rest of Canada	Total	Nine Cities	Rest of Canada	Total, All Provinces
	(millions of 2002 dollars)					
1986	2,833	16,156	18,989	2,063	4,758	6,820
1987	-452	18,252	17,800	-135	4,763	4,628
1988	-2,422	21,158	18,736	-6,555	8,325	1,771
1989	545	20,170	20,715	-3,092	6,663	3,570
1990	3,481	22,634	26,115	-597	7,145	6,547
1991	7,112	23,691	30,803	6,539	10,276	16,815
1992	3,504	26,569	30,073	11,095	12,564	23,660
1993	6,705	27,254	33,958	9,619	9,583	19,202
1994	2,874	27,202	30,075	2,693	9,877	12,569
1995	1,290	26,468	27,757	-326	9,620	9,294
1996	-5,823	20,913	15,090	-322	4,088	3,766
1997	-18,001	12,146	-5,856	-2,139	5,013	2,874
1998	-21,127	14,121	-7,005	87	8,753	8,839
1999	-23,522	15,379	-8,144	-7,530	4,897	-2,633
2000	-29,757	10,655	-19,102	-9,755	1,983	-7,772
2001	-25,958	12,029	-13,929	-417	7,197	6,780
2002	-23,464	14,494	-8,970	1,459	10,554	12,013

Note: Negative values indicate a budget surplus (revenues collected > expenditures made in that region).

Taken together, Figures 1 through 3 suggest that governments will tend to collect more in revenue and spend less on government programs in the nine large cities than elsewhere. Table 2 presents calculations showing the size of the federal government's deficit and the size of the relevant provincial government's deficit with the nine major cities, the rest of the country, and in total. It shows that in 2002, for example, the federal government realized a total budget surplus of $8.970 billion. That surplus was not evenly distributed across regions. The federal government realized a $23.464 billion surplus with the nine large cities and a $14.494 billion deficit with the rest of the country. In those years when the federal government was running large deficits nationally (1986–1995), those deficits were relatively small in the nine major cities and particularly large in the rest of the country.[19]

During the period 1986–2002 the aggregate budget deficit of the 10 provincial governments also tended to be larger outside of the major cities than in. In 2002,

19 Some of the reason for why the federal deficit might be larger in the nine major cities may reflect population differences between the nine large cities and the rest of the country. Serendipitously, however, the nine large cities are populated with almost exactly half of the country's total population. In 2002, for example, 50.6 percent of all Canadians lived in one of the nine major cities. Thus, the general message does not change should the calculations reported in Table 2 be reported in per capita terms.

Table 3: *Federal and Provincial Government Deficits in the Nine Major Cities in 2002, Alternative Allocation Assumptions*

	Federal	Provincial
	(millions of 2002 dollars)	
Estimated Deficit from Table 2	-23,464	1,459
Naïve Estimate of Deficit	-14,870	7,630
Deficit Explained by City-Specific Characteristics:	-8,594	-6,171
• Income Distribution Increases Revenue Collected by:	6,001	6,424
• Age Distribution Increases Spending by:	1,495	1,144
• All other Factors Increase Revenue or Decrease Spending by:	1,097	-1,397

Note: Negative values indicate a budget surplus (revenues collected > expenditures made in that region).

for example, the 10 provincial governments ran a budget deficit of $12.013 billion. Of this amount, only $1.459 billion was realized in the nine large cities, while the rest ($10.554 billion) realized in the rest of the country.[20]

To gain insight into the role played by income distributions, age distributions, employment patterns, the distribution of EI and social assistance recipients, and university attendees, in affecting federal and provincial government budget balances with the nine large cities, Table 3 presents calculations, for the year 2002, based on alternative assumptions about how those balances are allocated to the nine large cities.

The first row of Table 3 repeats the estimated values of the federal and the provincial government sector fiscal deficits with the nine major cities for 2002 reported in Table 2. The second row is what I call a naïve estimate of the size of these two deficits with the nine major cities. It is calculated by assuming all federal and provincial revenues and expenditures are allocated to the major cities simply on the basis of their share of provincial population. For example, I assume here that the $10.671 billion of personal direct tax revenue collected by the federal government in Alberta in 2002 is allocated to Calgary in proportion to the city of Calgary's share of Alberta's population (32 percent). Performing similar calculations for all revenue and expenditure categories shows that the federal government's deficit with the nine major cities in 2002 would have been -$14.870 billion rather than the -$23.464 billion reported in Table 2. The difference between these calculations, -$8.594 billion, is the size of the federal deficit with the nine large cities explained by the revenue and expenditure effects of city-specific characteristics with respect to age and income distributions, by the

20 Not all provinces contain one of the nine major cities. Calculating the total provincial deficit in the rest of the province for only those five provinces which contain one of the nine major cities gives a truer picture of the role played by large cities in determining provincial government budget balances. In 2002, for example, the five provinces containing the nine large cities ran a total deficit of $9.909 billion with $1.459 billion of this amount the result of deficits with the major cities. I look more closely at the results for individual cities in section 4.

disproportionate number of citizens in those cities who attend university, who are employed, who are aboriginal, and who collect federal Employment Insurance.

Similar calculations made with respect to the aggregate provincial government sector shows that had all provincial revenues and expenditures been allocated to the nine large cities simply on the basis of population the provincial deficit with the nine cities would have been $7.630 billion rather than the $1.459 billion reported in Table 2. The difference, -$6.171 billion, is the size of the provincial government sector deficit with the nine large cities explained by the revenue and expenditure effects of city-specific characteristics with respect to age and income distributions, and by the disproportionate number of citizens in those cities who are employed, and who receive provincial social assistance.

The fourth row in Table 3 measures the impact on the deficit of the income distributions of the nine major cities. These values represent the difference between tax revenues used to produce the deficit figures reported in Table 2 and the revenue which results when one assumes all revenue allocated on the basis of a city's income distribution is instead allocated on a simple per capita basis; that is, if those revenues were instead collected via a head tax. This recalculation shows that in 2002 the income distributions of the nine major cities were such to cause the federal government to collect an additional $6.001 billion in tax revenue relative to what it would have collected had federal tax revenue been raised solely via a head tax. Thus, the sensitivity of the federal tax system to income distribution accounts for a considerable reallocation of federal revenues toward the nine large cities. A similar adjustment to provincial revenues produces the result that in 2002 the sensitivity of provincial tax regimes to income distribution is such to cause a considerable reallocation of tax revenue — $6.424 billion — toward the nine large cities. All told, then, the sensitivity of the tax system to the distribution of income is responsible for causing taxpayers living in the nine large cities to pay $12.425 billion more in federal and provincial taxes than they would if the tax system were instead based on a head tax.

In a similar way, we can gain insight into the influence of age distribution on the sub-provincial allocation of government budgets by comparing the calculations in Table 2 with those that result from assuming age-sensitive government expenditures were instead made on a per capita basis. The implications of these adjustments are reported in the fifth row of Table 3. In 2002, the sensitivity of federal spending to age distribution accounts for the nine large cities receiving $1.495 billion more in federal spending than would have been the case had all spending been allocated on a per capita basis. A similar adjustment to provincial expenditures produces the result that in 2002 the sensitivity of provincial spending programs to the age distribution is such to cause a reallocation of $1.144 billion of program spending toward the nine large cities. All told, then, the sensitivity of federal and provincial spending programs to the age distribution is responsible for causing taxpayers living in the nine large cities to receive $2.639 billion more in government program spending than they would if age-sensitive spending was instead allocated on a per capita basis.

The last row in Table 3 reports the influence of the remaining city-specific characteristics on the federal and provincial government balances with the nine large cities. The fact that the nine large cities have a disproportionate number of

citizens who attend university, are employed, who are aboriginal, and who collect federal Employment Insurance has the effect of increasing the amount of revenue paid to (or reducing the expenditures received from) the federal government by $1.097 billion. The influence of these factors on the relationship of the nine cities with provincial governments is larger and opposite in sign. The fact that the nine large cities have a disproportionate number of citizens who attend university, are employed, and who collect provincial social assistance has the effect of decreasing the amount of revenue paid (or increasing the expenditures received) by $1.397 billion.

Deficits by Major Cities

Aggregating the calculations across all nine large cities has the potential to hide variations across cities. For that reason, in this section I examine each of the nine cities individually. In the discussion that follows, all values will be measured in real per capita dollars in order to facilitate comparisons across cities.

This section also introduces a new adjustment to the calculations. A problem with the calculations presented in Table 2 is that they reflect at least in part the size of any overall budget imbalance being realized by the provincial or federal government. This is important because a budget imbalance realized by a government in any region may be large simply because that government has chosen to run a large budget imbalance across all regions in its jurisdiction. Thus, regional balances will fluctuate over time with changes in the overall budget balance of the government in question. One set of calculations presented in this section will account for this by showing budget balances in the nine large cities after adjusting the government's overall budget to be in balance. This is accomplished by adjusting the amount of revenue collected in the city by an amount equal to the size of the government's overall budget imbalance times the share of taxes collected in that city. The assumption, then, is that the budget imbalance of the government in question is eliminated by a change in tax revenue.[21, 22] Two alternative calculations of the federal and of the provincial government fiscal balance are therefore presented for each year in each city; the fiscal balance and an adjusted fiscal balance which shows the impact of adjusting the amount of tax revenue collected in a city in a way that causes the federal or provincial government to have balanced its aggregate budget.

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21 To be precise, the share of the federal budget imbalance allocated to each city in the form of additional tax revenue was determined by the share to federal direct taxes, indirect taxes, and contributions to social insurance plans collected in that city relative to the total amount of those taxes collected nationally. Note that this approach does not mean that the federal budget imbalance with each province is adjusted to be zero but only that the federal budget imbalance in aggregate becomes zero. The share of the provincial budget imbalance allocated to each city in that province in the form of additional tax revenue was determined by the share to provincial direct taxes, indirect taxes, and contributions to social insurance plans collected in that city relative to the total amount of those taxes collected in that province.

22 One could alternatively assume the deficit is closed by cutting program spending. In that case the size of the adjustment borne by any region would be proportional to that region's share of total program spending.

Table 4: *Effects of Income and Age Distributions, Adjusted for Balanced Budgets, Average 1986–2002*

	Additional Revenue Collected in City Due to the City's Income Distribution		Additional Expenditure in City Due to City's Age Distribution	
	to Federal Government	to Provincial Government	to Federal Government	to Provincial Government
	Constant (2002) dollars per capita			
Toronto	532	442	-127	-118
Montreal	369	483	1	14
Vancouver	385	371	-57	-18
Calgary	660	459	187	-173
Edmonton	331	246	-146	-198
Ottawa	806	662	-43	-47
Quebec	896	1,312	-42	-12
Hamilton	285	239	85	72
Winnipeg	699	919	-69	-84
9 Cities	432	436	-45	-56

Note: Calculations reflect adjustments to revenue to ensure a balanced budget for the federal government and for each provincial government.

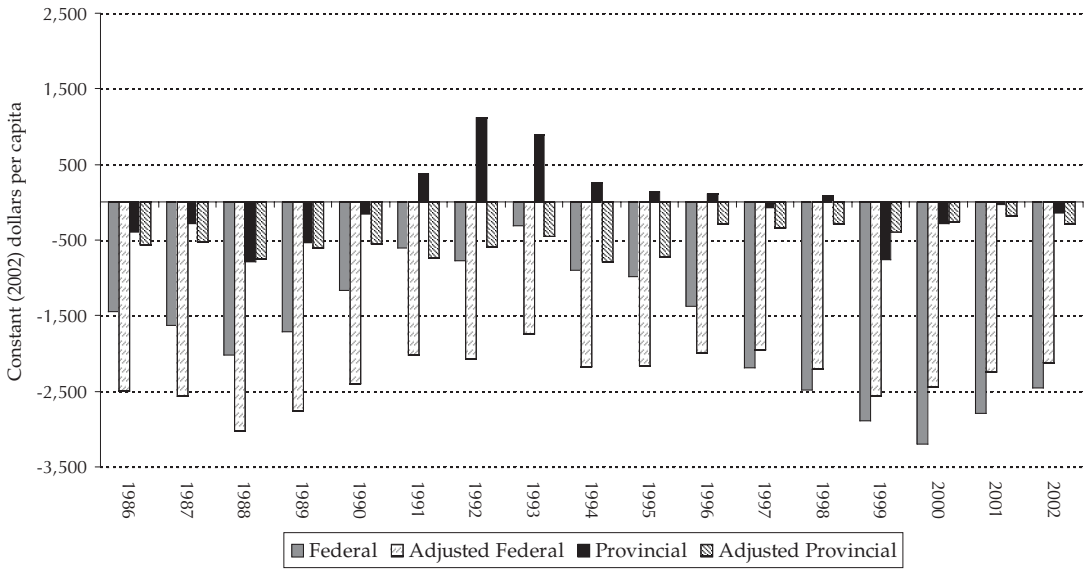
Differences in my benchmark measures between cities within a province will appear due to the fact those cities differ in terms of: (i) income and age distribution; (ii) differences in the number of social assistance and unemployment insurance recipients; (iii) differences in university enrolment; (iv) differences in aboriginal populations; and (v) differences in employment shares. The most important differences between cities within a province arise due to differences in income and age distributions. Table 4 shows real per capita amounts, averaged over the period 1986–2002, of the effect income and age distributions had on the amount of balance budget-adjusted revenue collected from, and expenditures spent in, each city. These calculations provide insight into why fiscal balances vary across cities. Reference to this table will be made as I discuss each city.

My approach to allocating federal revenues and expenditures to cities involves allocating those federal revenues and expenditures that are observed to be spent in that province. Thus, the general magnitude of federal spending in any city within a province, when reported on a per capita basis, will be similar across all cities in that province. For that reason, it will prove useful to examine the results for individual cities by examining them on a province-by-province basis.

Federal and Provincial Deficits in Ontario's Major Cities

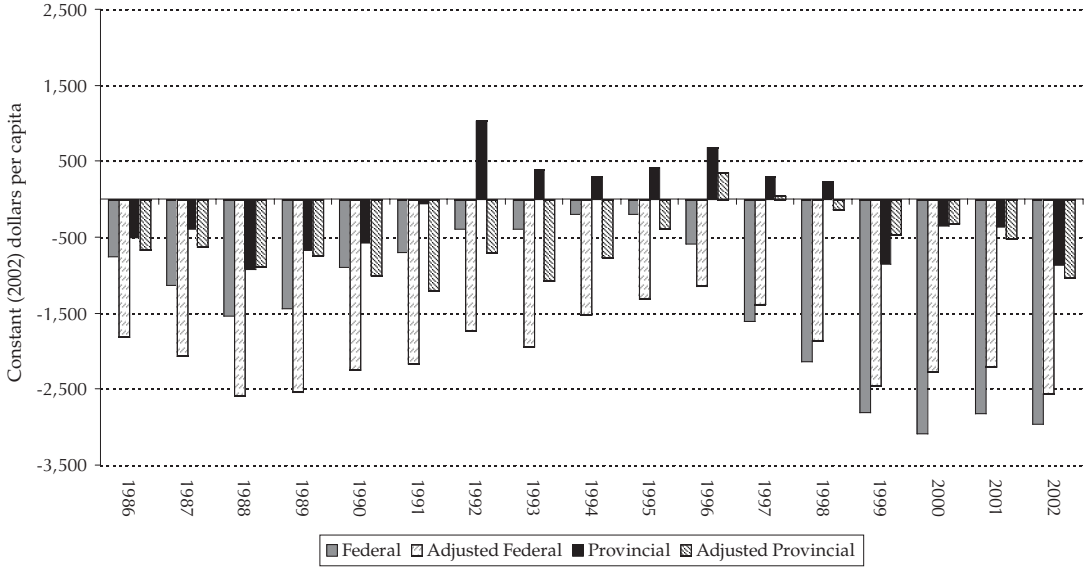
Figures 4, 5, and 6 graph four calculations for the years 1986–2002 for each of Toronto, Ottawa, and Hamilton, respectively. All calculations are presented in per capita terms and are measured in 2002 dollars. The bars measure the size of either the federal or the Ontario government's deficit (defined as expenditure minus revenue) with that city. Thus, a bar extending above (below) the zero line indicates

Figure 4: *Toronto — Federal and Provincial Surpluses/Deficits*



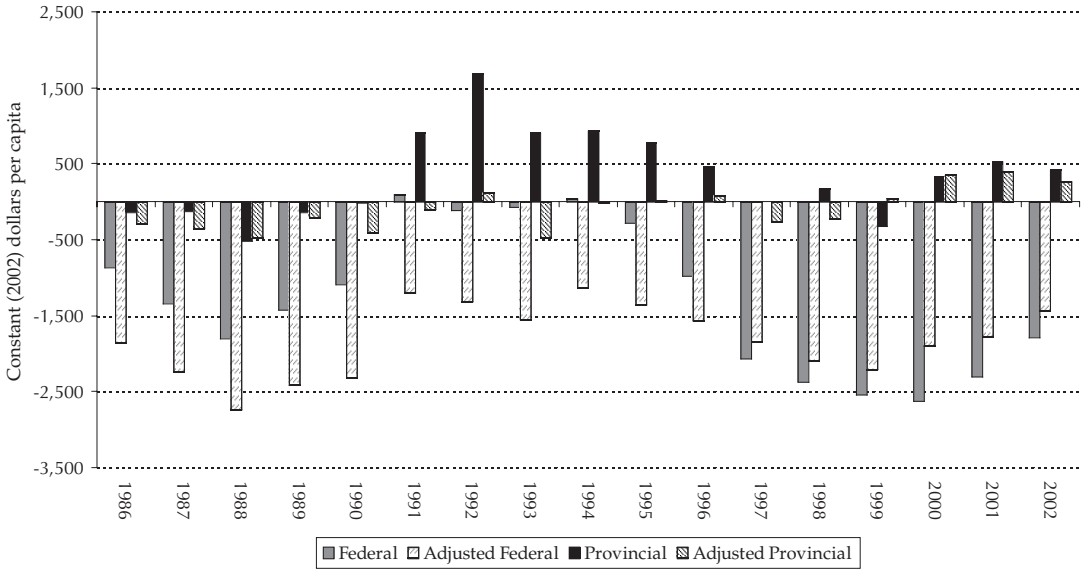
Source: Author's calculations.

Figure 5: *Ottawa — Federal and Provincial Surpluses/Deficits*



Source: Author's calculations.

Figure 6: *Hamilton — Federal and Provincial Surpluses/Deficits*



Source: Author's calculations.

that the citizens of that city receive more (less) by way of government expenditures than they pay in taxes. The solid grey and the hatched white and grey bars measure the federal government's fiscal imbalance while the solid black and the white and black hatched bars measure the provincial government's fiscal imbalance. The solid bars measure the size of the fiscal imbalance without adjustment for the fact the government in question may be running a budget deficit or surplus. The hatched bars adjust the size of the fiscal imbalance with the city by forcing the government under consideration to balance its budget.

Toronto: Looking first at Figure 4, we observe that the federal government has in every year during the period 1986–2002 collected more in revenue from the citizens of Toronto than those citizens received in the form of federal transfers or other expenditures. This imbalance, indicated by the solid grey bars, has varied over time, almost falling to zero in 1993 but growing to nearly $3,200 per person in 2000. The low value in 1993 was driven by the fact the federal government in that year was running a $34 billion deficit. Thus, the fact the federal government was collecting relatively little by way of taxes from all Canadians (by comparison to its level of spending) was responsible for the citizens of Toronto sending less tax revenue to the federal government than was usual. The rapid growth in the federal government's imbalance with Toronto after 1993 reflects the fact the federal government was during this period rapidly reducing its overall budget deficit and would, beginning in 1997, realize budget surpluses thereafter. The hatched white and grey bar adjust these figures to account for the federal government's overall budget imbalance. They show what the federal government's fiscal imbalance with the citizens of the city of Toronto would have been had it raised taxes sufficiently to have always maintained an overall budget balance. By this measure

the citizens of Toronto have throughout this period paid an average of $2,285 per person more in taxes to the federal government than they received in the form of federal transfer payments or other benefits attributed to federal spending.

The solid black and the white and black hatched bars present these same measures but with respect to fiscal balances with the Ontario provincial government. During the 1990s the citizens of Toronto received more by way of provincial government transfers and other benefits attributed to other types of provincial spending than they paid in provincial taxes. This reached a peak of $1,123 per person in 1992. This was, however, only the result of the fact the provincial government was running an overall provincial deficit. The hatched white and black bars correct for the overall provincial budget imbalance and shows what the provincial government's fiscal relationship with the citizens of Toronto would have been had it increased provincial taxes sufficiently to maintain a balanced budget. This adjustment shows that the provincial government, after adjusting for its overall budget imbalances, has more or less maintained a balanced budget with the citizens of Toronto; over the period 1986–2002 the average Torontonian paid $480 more in taxes to the provincial government than he or she received by way of provincial expenditures and transfers.

From Table 4 we observe that, after adjusting taxes to cause each level of government to maintain a balanced budget, the distribution of income in Toronto was such that on average over the period 1986–2002 each citizen paid $532 more in federal taxes, and $442 more in provincial taxes, than they would if all taxes had been head taxes. The age distribution in Toronto is such to have decreased provincial government expenditures by $118 per capita beyond what it would have been if all provincial government spending was allocated on a purely per capita basis. Federal government spending was decreased by $127 per capita as a result of Toronto's age distribution.

Ottawa: The federal government's per capita budget balance with the citizens of Ottawa averaged $1,338 over the period 1986 to 2002 (solid grey bars). Adjusting these calculations in a way to cause the federal government to realize balanced budgets in aggregate (the white and grey hatched bars) the federal government collected more in tax revenue than it spent, though by an amount ($1,986) that tended to be slightly smaller than in Toronto ($2,285). Table 4 shows that differences in income distributions explains, on average, $274 of the per capita difference in the federal government's imbalance with Toronto versus Ottawa.[23]

Adjusting for provincial budget imbalances (shown by the white and black hatched bars), the provincial government has realized both deficits and surpluses with the citizens of Ottawa; over the period 1986–2002 the average citizen of Ottawa paid $595 more in taxes to the provincial government than he or she received by way of provincial expenditures and transfers. Differences in income distribution caused the provincial government to collect $220 more in tax revenue per capita in Ottawa than in Toronto (refer to Table 4). Differences in age

23 It is noteworthy that the difference due to income distributions has grown over time. On average over the last 5 years of the sample period (1998-2002) citizens of Ottawa each paid $673 more in federal taxes than each citizen in Toronto as a result of differences in income distributions. This widening gap is due to an increase in the proportion of Toronto citizens in the lower income ranges and a decrease in that proportion in Ottawa.

distributions caused the provincial government to spend $71 more per capita in Ottawa than in Toronto.

Hamilton: Figure 6 shows that after adjusting for federal budget imbalances (the hatched white and grey bars) Hamilton has averaged a fiscal deficit with the federal government of -$1,816 per capita (that is, citizens in Hamilton paid $1,816 more in federal taxes than they received by way of federal services and transfers). This compares to an average federal fiscal imbalance of -$2,285 in Toronto. The reason for this difference stems from how Hamilton's income and age distributions differ from Toronto's. Table 4 reports that on average over the period 1986–2002 differences in income distributions caused each citizen in Hamilton to pay $247 less in federal taxes than each citizen in Toronto while Hamilton's age distribution resulted in the federal government spending an average of $212 more per capita than in Toronto.

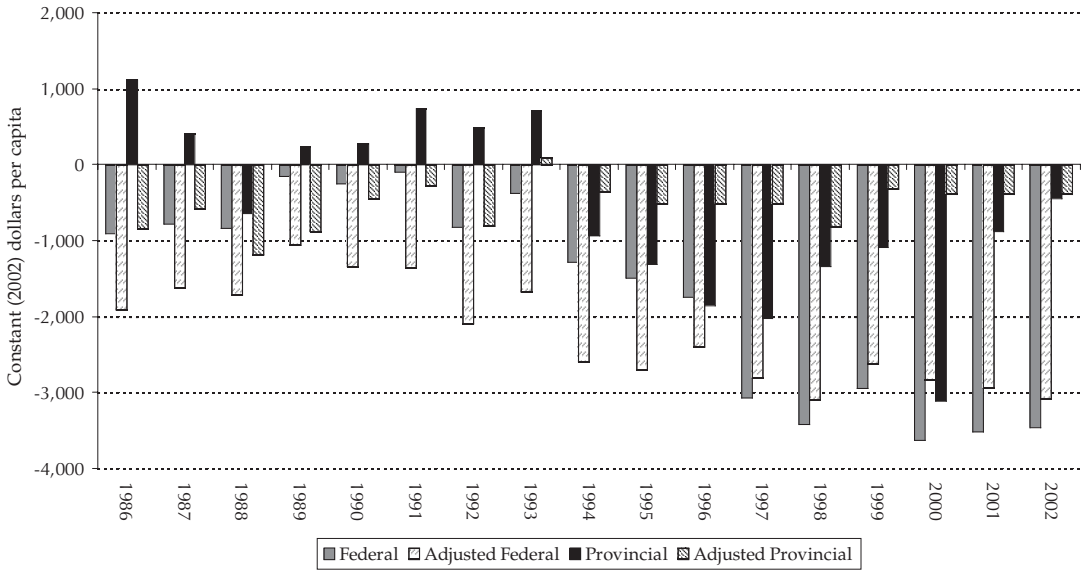
With respect to the provincial budget (adjusted for overall balance), over the period 1986–2002 the average citizen of Hamilton paid $86 more in taxes than he or she received by way of provincial services and transfers. This was easily the smallest provincial surplus of the three major cities in Ontario. As a result of its income distribution, the average Hamiltonian paid $203 less in taxes to the provincial government than the average citizen of Toronto and $423 less than the average citizen of Ottawa. Due to that city's age distribution, the average citizen of Hamilton received $190 more in provincial spending than the average citizen in Toronto and $119 more than the average citizen in Ottawa.

Federal and Provincial Deficits in Alberta's Major Cities

Calgary: Concentrating on the hatched bars showing the budgetary deficit after adjusting the federal and provincial budgets to be balanced, Figure 7 shows that the provincial government maintained a more or less constant budget surplus with the citizens of Calgary, particularly since 1994 (an average of $537 per capita). The federal government has regularly run a much larger surplus with the citizens of Calgary; on average the federal government collected $2,223 more in tax revenue from each citizen of Calgary than it has expended on federal programs. While this average amount is slightly less than the federal imbalance with Toronto ($2,285), it is interesting that the annual imbalance has grown in Calgary (by $1,174 between 1986 and 2002) whereas it has been shrinking in Toronto (by $372 between 1986 and 2002). These opposing trajectories reflect the fact that over this period Calgary's distribution of income has become more skewed toward the high-end causing federal tax payments to increase whereas the opposite has been true in Toronto.

Edmonton: Still concentrating on the hatched bars, the government of Alberta has run a somewhat smaller surplus ($278 per capita) with the citizens of Edmonton than it has with Calgary ($537 per capita). As reported in Table 4, this is mainly due to Calgary's income distribution being such to cause the provincial

Figure 7: *Calgary — Federal and Provincial Surpluses/Deficits*



Source: Author's calculations.

government to collect $213 more per capita in that city.

The average per capita federal surplus with Edmonton over the period 1986–2002 was $1,915; a surplus that averaged $308 less than Calgary's. As Table 4 reports, income distributions in these two cities is such to cause the federal government to collect an additional $329 per capita in revenue from Calgarians but the age distributions is such to cause the federal government to spend an additional $333 per capita in Calgary.[24] (Figure 8)

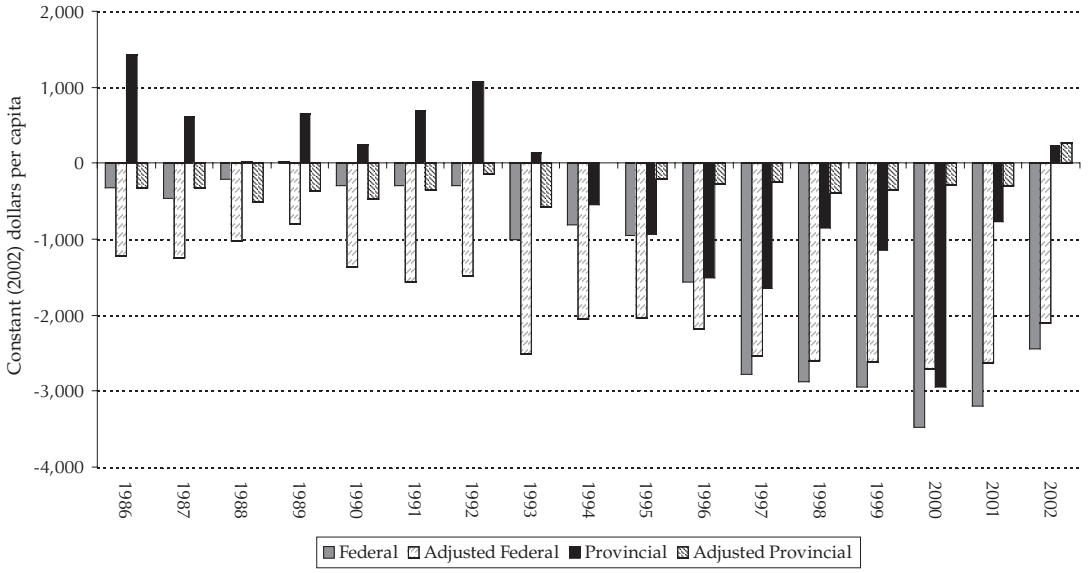
Federal and Provincial Deficits in British Columbia's Major City

Vancouver: British Columbia contains just one of Canada's nine major cities. Like Ontario and Alberta, British Columbia is typically a "have" province in the sense that it receives no federal equalization payments.[25] In common with cities in the other "have" provinces, the federal government realized a surplus with the citizens of Vancouver (that is, citizens of Vancouver contributed more by way of

24 The smaller federal budget surplus with Edmonton versus Calgary is therefore due to other factors such as the larger aboriginal population in Edmonton and a larger fraction of the population collecting EI. These two factors alone increased federal expenditures in Edmonton versus Calgary by an average of $105 per capita over the period 1986–2002.

25 In my sample, British Columbia received equalization payments in only three years and these payments were quite small; 1999 ($125 million), 2001 ($240 million), and 2002 ($71 million). The dollar amounts are equalization entitlements for the identified year. The actual amount received may differ slightly from this amount and it may be received in a later year than identified. Source: www.fin.gc.ca

Figure 8: *Edmonton — Federal and Provincial Surpluses/Deficits*



Source: Author's calculations.

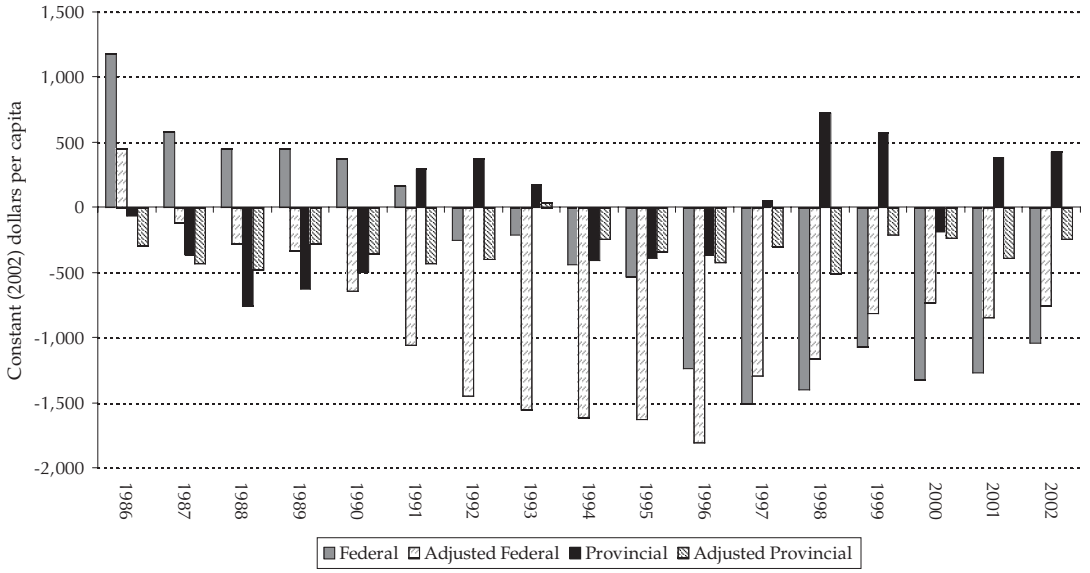
federal tax revenue than they received by way of federal program spending). This surplus averaged $415 per capita in raw terms and $918 per capita after adjusting the data to show the effect of causing the federal government to maintain a balanced budget. Consistent with British Columbia being on the cusp of "have" status, this average fiscal surplus with the federal government was considerably smaller than the average surplus experienced by citizens in the major cities of Ontario and Alberta (Figure 9).

After adjusting for provincial government budget imbalances (the white and black hatched bars) the average citizen of Vancouver paid $323 per capita more by way of taxes than they received by way of provincial spending. Table 4 reports that the distribution of income in Vancouver is such that, on average over the period 1986–2002, citizens of Vancouver paid $371 per capita more in provincial tax revenue than they would have paid had taxes been collected via a head tax and the city's age distribution is such that citizens received $18 per capita less in provincial government spending than would have been the case if all provincial government spending were allocated on a per capita basis.

Federal and Provincial Deficits in Quebec's Major Cities

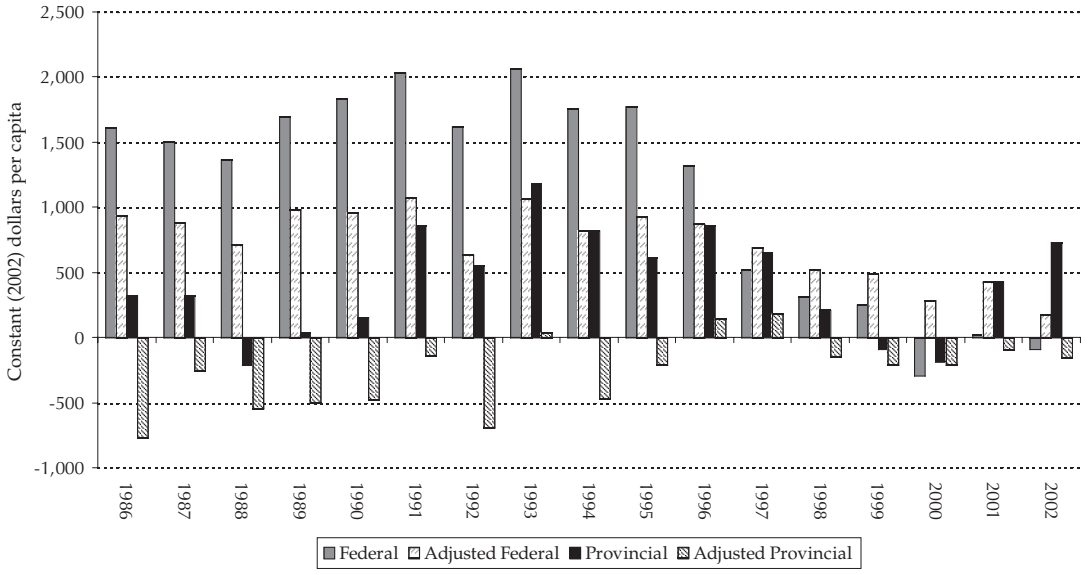
Quebec is the first "have-not" province to be considered. As a result of the equalization program and other province-specific transfers, over the period 1986-2002 the federal government collected from each person in the province of Quebec an average of $1,345 less in tax revenue each year than it spent. As a consequence

Figure 9: *Vancouver — Federal and Provincial Surpluses/Deficits*



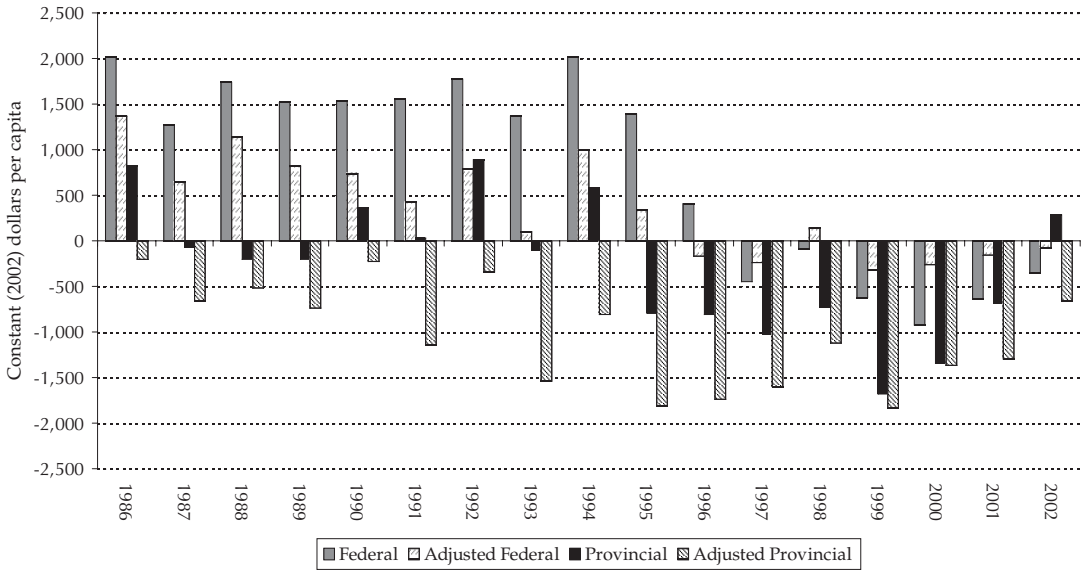
Source: Author's calculations.

Figure 10: *Montreal — Federal and Provincial Surpluses/Deficits*



Source: Author's calculations.

Figure 11: *Quebec — Federal and Provincial Surpluses/Deficits*



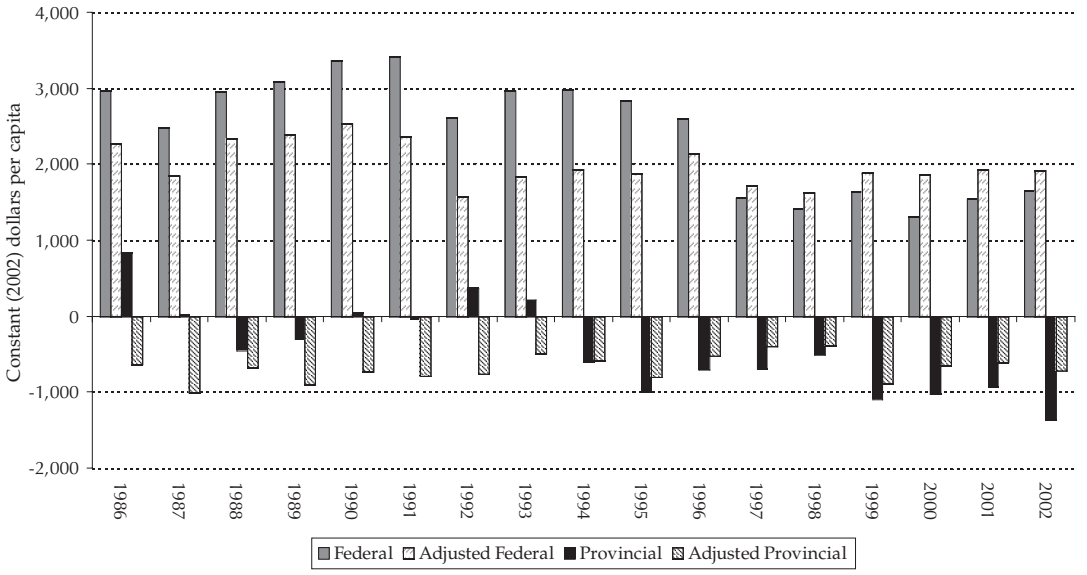
Source: Author's calculations.

of these large transfers the federal government will be seen to have had considerably larger fiscal deficits with the cities of Montreal and Quebec than it did with the six cities previously considered, all of which are in "have" provinces. Figures 10 and 11 present the four calculations of fiscal imbalances for the cities of Montreal and Quebec, respectively.

Montreal and Quebec City: The solid grey bars indicate that the federal government, until 1997 in Quebec City and until 2000 in Montreal, regularly ran substantial deficits with those cities. On average over the period 1986–2002, the federal government collected $1,138 less in tax revenue than it spent in Montreal and collected $799 less in tax revenue than it spent in Quebec City. The fact that the size of these imbalances fell dramatically after 1997 reflects the federal government's efforts to reduce its overall budget deficit. The fact this adjustment affected Quebec City somewhat sooner than Montreal reflects differences in the income and age distributions of these cities.

The white and grey hatched bars show that even after adjusting the amount of tax revenue collected in the two cities in proportion to their shares of all federal taxes collected in Canada, the federal government typically continued to spend more than it collected in revenue in both cities. In Montreal this was true in every year. The federal government achieved a balance with citizens in the city of Quebec in 1996 and more or less maintained that balance to the end of the sample period. The source of the difference in the federal balance with these two cities is differences in their income and age distributions. As reported in Table 4, the distribution of income is such to cause the average person in the city of Quebec to

Figure 12: *Winnipeg — Federal and Provincial Surpluses/Deficits*



Source: Author's calculations.

pay $527 per person more in federal taxes and received $43 per person less in federal expenditures than the average person in Montreal.

Over the sample period, the government of the province of Quebec typically reported budget deficits, although a budget balance was almost achieved at the end of the 1990's before growing again. Adjusting revenues to cause the provincial government to maintain a budget balance (the white and black hatched bars) shows that since the early 1990s the province maintained a more or less balanced budget relationship with Montreal but maintained a sizeable budget surplus with Quebec City. The data in Table 4 show that for the most part this difference reflects differences in the distribution of income in the two cities. Averaging over the 1986–2002 period, the distribution of income in Quebec City was such that taxpayers there paid $829 per person more in provincial taxes than did the average taxpayer in Montreal. Differences in age distributions had a smaller but complementary influence; the difference in age distributions was responsible for the average resident of the city of Quebec receiving $26 less by way of provincial government spending than the average citizen of Montreal.

Federal and Provincial Deficits in Manitoba's Major City

Winnipeg: Winnipeg is the only major city in Manitoba, which, like Quebec, is a "have not" province and hence is a recipient of federal equalization payments. As a result of the equalization program and other province-specific transfers, on average over this period the federal government collected from each person in the province of Manitoba $3,235 less in tax revenue each year than it spent. This

Table 5: *Average for Period 1986–2002*

	Budget Deficit (+) or Surplus (-) with Federal Government			Budget Deficit (+) or Surplus (-) with Provincial Government		
	Total (millions $)	Per Capita ($)	Adjusted Per Capita ($)	Total (millions $)	Per Capita ($)	Adjusted Per Capita ($)
Vancouver	-917	-415	-918	-13	-37	-323
Edmonton	-1,283	-1,401	-1,915	-303	-305	-278
Calgary	-1,503	-1,690	-2,223	-534	-563	-537
Winnipeg	1,634	2,436	2,007	-289	-422	-678
Hamilton	-815	-1,264	-1,816	224	348	-86
Toronto	-7,461	-1,694	-2,285	-92	-23	-480
Ottawa	-1,091	-1,388	-1,986	-91	-126	-595
Montreal	3,733	1,138	736	1,444	430	-263
Quebec City	515	799	373	-188	-268	-1,030

Note: All figures measured in constant 2002 dollars. Deficit = Expenditure — Revenue

Interpretation: On average, over the period 1986-2002, the citizens of Vancouver, for example, realized a budget surplus with the federal government. That is to say, in an average year citizens of Vancouver paid $917 million more in federal taxes than they received by way of federal spending, or about $415 per person. Some of the imbalance is due to the fact that the federal government often ran budget deficits with the whole country. If we adjust federal tax revenues by an amount sufficient to cause the federal government to have maintained a balanced budget with the whole country, then each citizen of Vancouver would have have paid $918 more on average in taxes than they received by way of federal spending. Similar interpretations apply to other cities and their fiscal relationships with provincial governments.

compares to $1,345 in Quebec, the other "have not" province in this sample. On a per capita basis, then, Manitoba is easily the largest net recipient of federal expenditures amongst the five provinces considered here. As a consequence of this large provincial imbalance, the federal government will have a considerably larger fiscal deficit with the city of Winnipeg than any of the other major cities. (Figure 12)

The size of the federal government's real per capita deficit with Winnipeg (the solid grey bars) averaged $2,436 over the period 1986–2002. This was easily the largest deficit amongst the nine large cities. Adjusting the data to reflect a balanced aggregate budget for the federal government reduces the average size of this imbalance to $2,007 per capita. The white and black hatched bars show Winnipeg's relationship with the government of the province of Manitoba after adjusting the latter's revenues in a way to cause it to be in balance. By this measure, the province has maintained a more or less constant surplus with the city of Winnipeg. That is, citizens of Winnipeg have on average paid $678 per capita more in provincial taxes than they have received by way of provincial expenditures. This imbalance reflects Winnipeg's income distribution causing the city to pay $919 more in provincial taxes per capita than it would if taxes were paid on a strict per capita basis and to receive $84 per person less in provincial spending than would be the case if spending were allocated on a per capita basis.

Summary data showing averages for the period 1986–2002 for all cities, including Winnipeg, appear in Table 5.

Conclusion

Any fiscal policy affects the economy and citizens along a variety of dimensions. An increase in taxes on high-income earners, for example, is intended to raise revenue from those best able to afford a reduction in disposable income but it also affects middle-aged people more than young, white-collar workers more than blue-collar, etc. In a similar way government spending on health care, while aimed at aiding the ill also tends to benefit the old more than the young and the poor more than the rich. The calculations presented in this paper show how such choices can also be differentiated by their impact on those living in large cities as opposed to elsewhere.

It is unfortunate that we cannot calculate the actual, rather than inferred, amounts of revenue collected and the amount of expenditure spent in cities by provincial and federal governments. It's unfortunate because cities are increasingly recognized as major drivers of provincial and national economies and it would be useful to know how the budgets of senior levels of government influence the economies of cities. This paper has described and implemented a method by which one may infer the amounts of revenue collected and the amount of expenditure spent in cities by provincial and federal governments. The approach is based on an understanding that federal and provincial government revenue collection and spending mechanisms are sensitive to certain economic and demographic characteristics and the assumption that these mechanisms work in an impartial way that ignores city boundaries. If a government's revenues or expenditures differ in one city versus another, this is the result of differences in city characteristics with respect to income and age distributions, their shares of provincial employment, the proportions of their total populations collecting various types of social assistance, the proportion which is aboriginal, and the proportion which attends university. Using measures of how cities differ along these dimensions, I infer how federal and provincial revenues and spending are allocated to cities.

The resulting calculations provide what might be thought of as a neutral benchmark: Assuming tax legislation and the rules which govern how government spending programs operate are applied impartially, the calculations presented here represent an estimate of federal and provincial revenues and expenditures in Canada's nine largest cities. It is important to stress that no claims of unfairness can be made on the basis of these calculations. Any fiscal imbalance reported here can only be claimed to be unfair by someone willing to argue that the legislation which governs provincial and federal tax and spending programs is unfair in how it impacts taxpayers, be they individuals or firms. For an advocate of a particular city to suggest that citizens of that city are unfairly treated by the federal government because the neutral benchmark shows they pay more in federal taxes per capita than then receive by way of federal spending requires that he or she argue against a federal tax system which taxes those with high incomes more heavily than those with low incomes, and against federal spending programs that

target the aged and the disadvantaged. It would only be by comparing estimates of a neutral benchmark against observed amounts that any claim of unfair treatment of a city by the federal or the city's provincial government could possibly be made. Since the true amounts of federal and provincial spending by city do not exist, such a comparison cannot be performed and so no claims of "unfairness" can be made on the basis of these estimates.

The estimate of a neutral benchmark can be used to observe how the legislation which governs provincial and federal tax and spending programs affects cities as opposed to the rest of the country. The results show that the impartial application of federal budget legislation typically results in that government collecting substantially more in revenue from taxpayers living in large cities than it spends in those cities. The opposite is true in the rest of the country. This difference reflects the fact the federal budget is strongly redistributive toward those with low incomes and toward the aged, and that cities are populated by those with relatively high incomes and are disproportionately populated by the relatively young. While there is nothing untoward about this geographic allocation of the federal budget, if the size of budget balances matter for regional economic growth then the trade-off between efficiency and equity that policymakers must balance when considering tax and expenditure programs may need to be considered along the regional as well as the personal dimension. A highly redistributive federal budget may, in other words, be acting to reduce levels of economic activity in those regions of the country — the large cities — that are responsible for a disproportionate amount of the new wealth created in Canada and in so doing be harming the country's economic prospects.[26] On the other hand, fiscal transfers from cities to rural areas may be justified to compensate rural areas for the fiscal implications of a freely mobile population that produces a geographically unbalanced demographic structure; as might occur when the young move to cities for employment but retire to small towns.[27] The neutral benchmark produced in this paper offers insight into the magnitude of fiscal imbalances between rural and urban areas and in so doing provides at least part of the evidence required to make judgements about the importance of these considerations.

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26 Whether Canada's economic prospects are harmed by the fact redistributive budgets impact relatively more those living in large cities depends on the significance of agglomeration effects; that is, redistributive taxes impose disincentive effects on highly productive people and firms regardless of where they are located. Whether redistributive taxes impose still further economic costs as a result of being imposed on individuals and firms concentrated in a central location (a big city) depends on the existence of economic benefits stemming from individuals and firms being employed in close proximity to one another; so-called agglomeration effects.

27 Aronsson, Blomquist, and Micheletto (2007) investigate the implications of age-related mobility for regional tax bases and public spending in a theoretical model. They argue that if age-related income transfers are deemed desirable, then certain geographic areas may become nodes for low tax-paying but high transfer-receiving citizens and may as a result provide inefficient levels of elderly care. They investigate the desirability of regional transfers to encourage rural areas to provide higher levels of elderly care and so draw the elderly away from cities where they add to congestion. In this way, fiscal transfers from urban to rural areas may improve the country's economic prospects.

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