A Case of Vertical Fiscal Imbalance -

The Calgary Experience

(An Update)

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Executive Summary

Objectives

The 2010 study "A Case of Fiscal Imbalance - The Calgary Experience" used the existing Statistics Canada financial accounts database and showed that between 1988 and 2007 Calgarians made positive net financial contributions to the provincial and federal governments, but made negative contributions to the Calgary local government. In November 2013, Council directed Corporate Economics to update the 2010 study. The 2010 study relied on government financial accounts data. The database used for the 2010 study is no longer available. This report uses a new database and provides updated information on the contributions Calgarians made to the three orders of government – federal, provincial and local[1]. This study has the following objectives:

- Enhance our understanding of the challenges posed by vertical fiscal imbalance and draw lessons from economic analysis on the methods for resolving them.

- Estimate the contribution of Calgarians to the fiscal position of the three orders of government over a 23 year period (1991-2013). This is measured using net financial contribution, which is total revenue and capital consumption allowances less current expenditures and capital spending.

- Estimate the responsiveness of different revenue streams to changes in economic and population growth.

- Suggest actions the federal and provincial governments could take to resolve vertical fiscal imbalance in their relationship with Calgary's local government.

Key Findings

Drawing on widely accepted theoretical and empirical research, this report establishes a connection between fiscal stress (significant budgetary challenges) in the Calgary local government and vertical fiscal imbalance.

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1 Calgary local government data is used to draw inferences about the state of Calgary's municipal government finances.

Vertical fiscal imbalance is a situation where the fiscal capacity of one order of government is insufficient to sustain its spending responsibilities, while the fiscal capacity of another order of government is greater than is needed to sustain its spending obligations, while both orders of government provide public services to the same taxpayer (Slack 2006). A number of important findings emerge, of which the most notable are:

- Economic analysis indicates that local public goods should be provided by the government that is closest to the people.

- Adverse consequences of vertical fiscal imbalance on local governments occurs because of:

  - legal constraints on the ability of local governments to generate their own revenue;

  - varying levels of dependence on intergovernmental transfers over time; and

  - provincial and national governments' influence on key local expenditures such as wages and pensions.

- *The contribution of Calgarians to provincial and federal governments exceeds investments and resources returned from these governments to Calgarians and their city. The local government has to rely on intergovernmental transfers in order to obtain a net positive contribution from Calgarians.*

- Growth in Calgary's population translates into large increases in local government expenditures and small increases in their revenue.

Cumulative Net Present Value of Net Financial Contributions to The Three Orders of Government by Calgarians
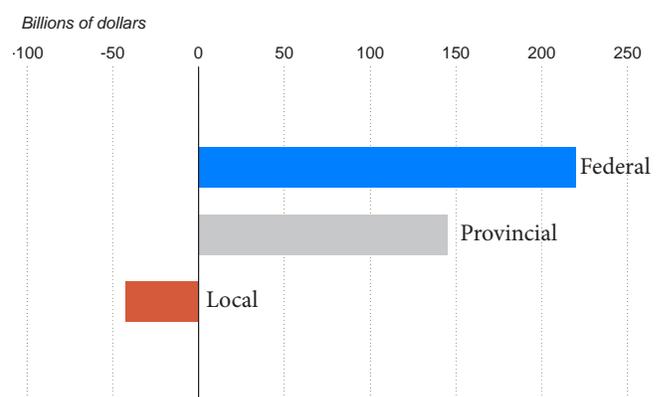
Source: Conference Board of Canada, Statistics Canada, Corporate Economics.

- Property tax levy changes do not fully capture changes in local economic activity. Provincial legislation requires that Alberta local governments maintain a balanced operating budget and this restricts the role of property tax revenues to that of filling the gap between operating expenditures and non tax revenue. This has translated into cuts on the property tax rate which gets larger as the tax base increases.

- Resources are inadequate for capital expansion projects to meet the needs of a growing city.

Conclusions

Using the updated financial accounts database, the conclusions of this study and the 2010 study are very similar. Both reviews of the impact of vertical fiscal imbalance on The City of Calgary have generated a number of important results and identified the consequences of the current vertical structure of spending and revenue generation responsibilities across the three orders of government:

- The net financial contribution by Calgarians to the federal government has been positive and increasing.

- The net financial contribution by Calgarians to the provincial government has been positive.

- Excluding intergovernmental transfers, the net financial contribution by Calgarians to the local government has been negative. It is only with the inclusion of intergovernmental transfers that the net financial contribution turns positive.

- Property tax revenue is unresponsive to economic growth because it is designed to address the gap between expected operating expenditures and non property tax revenue. This has led to a reliance on intergovernmental transfers to meet capital expansion costs.

- Intergovernmental transfers have proven to be an incomplete tool for resolving fiscal imbalance and local policy makers require different tools to deliver local public goods.

Recommendation

The recommendation is to remain revenue neutral from the point of view of the taxpayer and grant a different basket of revenue generating tools to local government authorities that includes revenue sources that are more sensitive to the prevailing economic conditions in municipalities. Specifically, the suggestion is for intergovernmental transfers to be de-emphasised in favor of growth sensitive revenue sources. This will ensure that there is no change in the effective tax rate.

Government Fiscal Position in Calgary

	1988		2007		2013		1991-2013
	$ Billion	Share of Total, %	$ Billion	Share of Total, %	$ Billion	Share of Total, %	Annual growth, %
Total Revenue excluding intergovernmental transfers	**7.3**	**100**	**36.8**	**100**	**39.6**	**100**	**5.7**
Federal Government	3.4	47.0	18.0	48.9	20.0	50	6.4
Provinciall Government	3.1	43.0	15.9	43.2	16.0	40	5.3
Local Government	0.7	10.0	2.9	7.9	3.8	10	4.0
Total Expenditures excluding intergovernmental transfers	**7**	**100**	**19.8**	**100**	**25.1**	**100**	**4.4**
Federal Government	2.4	34.0	4.6	23.2	5.2	20.9	2.3
Provinciall Government	3.2	46.0	10.1	51.0	13.4	53.5	5.1
Local Government	1.4	20.0	5.1	25.8	6.4	25.6	5.2
Net Contribution excluding intergovernmental transfers	**0.7**	**100**	**17.5**	**100**	**15**	**100**	**9.3**
Federal Government	1.1	164.0	11.9	68.0	13.0	86.7	9.8
Provinciall Government	0.1	17.0	7.0	40.0	4.1	27.3	6.3
Local Government	-0.5	-81.0	-1.4	-8.0	-2.1	-14.0	-5.7

* Numbers may not add up due to rounding
Source: Statistics Canada, Corporate Economics

1. Introduction

1.1 Motivation and Approach

The 2010 study "A Case of Fiscal Imbalance — The Calgary Experience" showed that between 1988 and 2007 Calgarians made positive net financial contributions to the provincial and federal governments, but made negative contributions to the Calgary local government. The report attributed the outcome to local government spending obligations exceeding local government revenue, while provincial and federal government revenue from Calgary exceeded spending obligations on Calgarians.

This is evidence in support of vertical fiscal imbalance affecting the Calgary local government[2]. Specifically, a vertical fiscal imbalance exists when "the fiscal capacity of one order of government is insufficient to sustain its spending responsibilities while the fiscal capacity of another order of government is greater than needed to sustain its spending obligations, while both orders of government provide public services to the same taxpayer"(Slack 2006)[3]. An additional litmus test for the existence of a vertical fiscal imbalance is the extent to which an order of government faces a formal constraint on its ability to raise revenue to meet increased spending obligations (Standing Committee on National Finance 2007). The 2010 study attributed Calgary's situation to rapidly increasing spending obligations over time, yet limited revenue-raising capabilities (fiscal capacity) given legal restrictions set out in the Municipal Government Act.

In November of 2013, City Council directed Corporate Economics to assess the current situation and update the 2010 study. The overriding motivation for the assessment is to address the following question: "Why does The City of Calgary experience financial stress in providing services to citizens, even in good economic times?" Ordinarily one would expect that in good times, local government authorities should have the ability to generate funds in order to provide services and invest in new infrastructure for the municipalities they serve. In reality, The City of Calgary did not benefit as much in boom times as the federal and provincial governments did, due to the municipal government's limited access to growth related or growth sensitive sources[4].

This study uses Government Finance Statistics to estimate the revenue and expenditures that flow from and to Calgary[5]. Specifically, the study evaluates the following:

- The contribution of Calgarians' to the balance sheet of the three orders of government over the 1991-2013 period[6].

- The responsiveness of different revenue streams to changes in economic and population growth.

- The methods for fixing the chronic fiscal gap through better revenue coordination with the federal and provincial governments.

1.2 Background and Context

The Alberta economy, in general and Calgary in particular, experienced rapid growth in the early part of the twenty-first century. The local economy benefited from an expanding world economy that drove up demand for commodities. In this period, prices for resources such as crude oil and natural gas rose sharply and the province realized the benefits

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2   While the focus of this study is on vertical fiscal imbalance, horizontal fiscal imbalance is a challenge in other jurisdictions. In provincial-federal fiscal relations, horizontal fiscal imbalance refers to a situation where "provinces/territories differ in their fiscal capacity to provide similar levels of public services to their citizens at similar rates of taxation" (Standing Committee on Finance 2005: 19).

3   Enid Slack (2006), "Fiscal Imbalance: The Case for Cities," http://carleton.ca/cure/wp-content/uploads/municipal_fisal_imbalance2006.pdf.

4   Growth related or growth sensitive revenue sources are those revenue sources which grow automatically with the economy.

5   The Government Finance Statistics program provides data on: revenue, expenditures and the resulting surplus or deficit, assets and liabilities and net worth or net debt position. This program is administered by Statistics Canada. The data generated under the program are available in the CANSIM Table 385 series.

6   The estimation methodology was developed by the C4SE in 2005 and has been used by various government entities including The City of Toronto and Alberta government. The 1991-2013 period was chosen due to data availability.

1.   Introduction

from a combination of rising prices and increased sales volumes. Increased business profits and government revenue created the basis for a sharp increase in investment spending, which in turn, resulted in job creation. Higher employment growth and robust demand for labour resulted in increased net migration to the region (see Figure 1.1). Strong population growth and growing incomes drove consumer spending upwards, further increasing business cash flow. In short, growth resulted in further growth. During this period, Calgary increased its share of total employment relative to both Alberta and to Canada and the same can be said for economic activity overall.

During the 1991-2013 period, Calgary enjoyed faster population and economic growth than the rest of Alberta and Canada, thanks to large inflows of inter-provincial and international migrants looking for job opportunities and a higher standard of living. Over the review period, population grew by 77 per cent in Calgary, 55 per cent in Alberta and 26 per cent in Canada. Correspondingly, Calgary's real gross domestic product (GDP) per capita grew from $72,100 in 1991 to $94,100 in 2006; an average annual growth rate of 1.8 per cent. Between 2006 and 2009, real GDP per capita contracted by 7.4 per cent. In the aftermath of the 2009 economic recession, GDP per capita recovered and stood at $94,600 by 2013[7].

Strong population growth in Calgary induced an equally robust demand for local goods and services, as well as infrastructure[8]. While economic growth has obvious

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7   Real GDP is measured in 2007 Canadian Dollars.
8   The City of Calgary as a provider of local goods and services has continuously and increasingly been financially challenged with respect to its ability to provide these goods and services with the current revenue streams. The major revenue stream for most municipalities in Canada is property taxes. The rest of the funding is through fees, permits and intergovernmental transfers. The City is responsible for a variety of services such as the upkeep and maintenance of its roads, the protection of its citizens (police and fire services), the availability of utilities, parks and recreation, public transit, public libraries and a range of others. As economic opportunities improve people migrate to regions with such characteristics, looking for jobs, properties, housing, businesses, a better life, and other amenities. When the additional revenue required to provide additional services due to growth is less than the additional expenditures required to provide those services, the resulting population growth puts additional stress on a municipality.

Figure 1.1 Recent Total Employment Trends in Calgary, Alberta, and Canada

Index, 1991 = 1.0
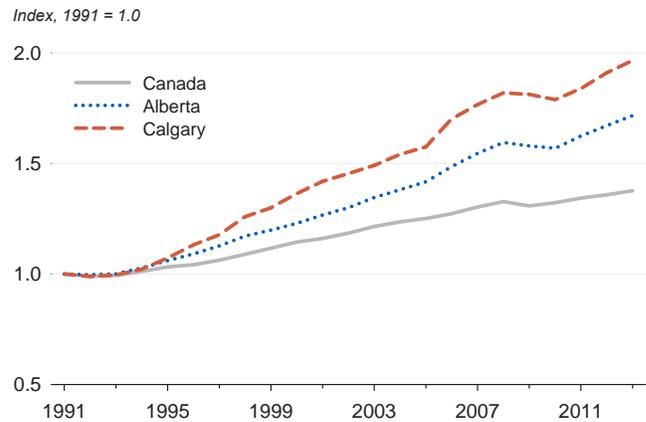
Source: Statistics Canada, Corporate Economics.

benefits it also comes with significant costs. Economic and population growth resulted in increased stress on existing infrastructure such as road networks by increasing traffic congestion and travel times and also increased air pollution. The historical data showed that the growth in local government expenditures outpaced revenue. Consequently, the Calgary local government's reliance on provincial government transfers grew over time as it tried to balance its operating and capital budgets.

Calgary's local government has been and continues to be financially challenged in its ability to provide local goods and services with current revenue streams. The major component in the revenue stream for most municipalities in Canada is property taxes. Municipalities assert that property tax revenue is unresponsive to economic growth (Federation of Canadian Municipalities 2006). Consequently, the Calgary local government's debt level has grown as it attempts to meet the infrastructure needs of a growing population with a constrained revenue base. Debt per capita has increased from $1, 410 per capita in 1999 to $3,981 in 2013.

The implication is that the "local tax payer" is faced with upward pressures on his or her property tax bill to enable the local government to fund the additional expenditures needed to provide the same quality of services. Unlike sales or income taxes, property taxes do not respond fully to economic growth. Therefore,

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property tax as a revenue generation vehicle falls short of capturing the growth benefits needed to meet the expenditure requirements of a rapidly growing city.

The financial data shows that rapid economic growth in the province and the city contributed to increased revenue and expenditures for the three orders of government, albeit to varying degrees. The federal and provincial governments benefited most from Calgary's economic growth, as seen in the rapid growth in their own-source revenue. It can be inferred from the data that improvements in the Government of Canada's and the Government of Alberta's financial positions stemmed largely from the contributions of citizens and businesses in leading economic regions such as Calgary. Those regions are the urban areas where the majority of Canada's working age population and employed labour force live and work, and where most of the country's economic activity occurs. Recent improvements in the fiscal position of the Alberta and Canadian governments have not been extended to the local government.

The share of tax revenue collected by local governments in Alberta averaged about 9 cents for every dollar in taxes collected between 2009 and 2013. The federal government's tax share averaged 59 cents, while the share for the provincial government averaged 32 cents.

After an initial drop from 45.0 percent in 1991 to 34.6 per cent in 1995, the share of property taxes to total revenue for Calgary's local government has increased to 49.7 per cent in 2013 (figure 1.2). Property tax revenue increased at an average annual rate of 4.5 per cent per year over the 1991–2013 period (figure 1.3). The taxes for the provincial government and federal government grew at higher average annual rates of 6.4 and 6.7 per cent, respectively over the same period (figure 1.4). Alberta's nominal GDP, which is the broadest measure of the tax base, grew at an average annual rate of 7.0 per cent over the same period.

1.3   Organization of the Report

This report is organized into five sections. This first section, the introduction, outlines the objectives and structure of the report. The second part is devoted to a review of the literature on local public finance, with an

Figure 1.2 The Evolution of Property Tax as a Share of The City of Calgary's Revenue
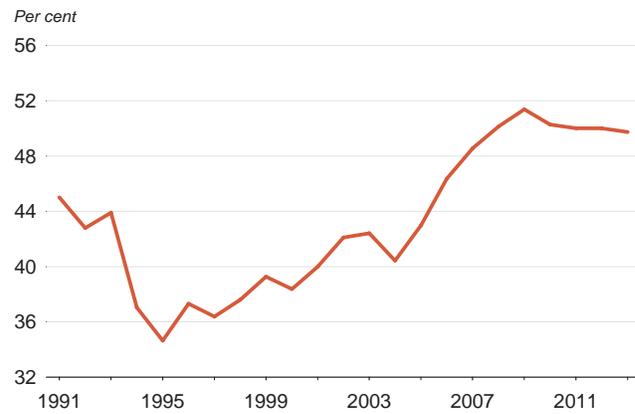
Source: Statistics Canada, Corporate Economics.

Figure 1.3 Growth of The City of Calgary's Property Tax Levy

Source: Statistics Canada, Corporate Economics.

Figure 1.4 Trends in Municipal, Provincial and Federal Tax Revenue
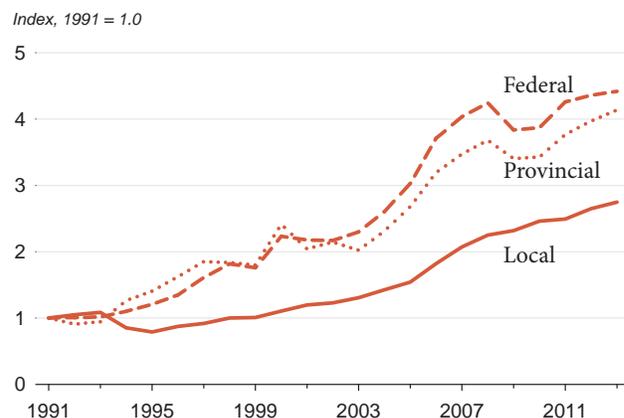
Source: Statistics Canada, Corporate Economics.

emphasis on vertical fiscal imbalance. The purpose of this section is to place the study into a larger context by showing that as the world economy has evolved from a resource-based economy to an industrial economy, and now to a largely service-oriented and knowledge-based economy, the economics literature on local government finance has also evolved. In section 3, the method for estimating the flow of revenue into and out of Calgary from the three orders of government is outlined. These estimates are derived from similar data for Alberta as a whole, which show the revenue from and expenditures by the various orders of government in Alberta. The empirical findings are shown in section 4. The final section provides some broad recommendations to address the report's findings. This report also has a companion volume. The second volume provides a detailed description of the empirical methodology, data, statistical analysis and results.

2. Literature Review

2.1 The Fiscal Challenge that Arises in an Attempt to Meet Citizen Expectations

The determination of the optimal set of public goods and services to be delivered to citizens by each order of government – federal, provincial, and local – has been a source of interest to policy makers and economists alike. Also of interest is the ideal set of resources to use in financing this provision so that a society thrives economically[9]. The mobility of citizens and firms has an important role to play in solutions proposed by economics.

Citizens choose to consume public goods and services because they derive value from them, while governments need to respond by delivering public goods at costs that match the value citizens derive (Samuelson 1954). This places a requirement on governments to ensure they truly understand and respond to citizen expectations by providing a package of services best suited to their tastes[10]. Failing this, they could lose them as residents (Tiebout 1956).

Local governments are aware of the importance of businesses to their economies and compete to have firms located in their jurisdiction (Wilson 1986, Zodrow et al. 1986). For local governments, one of the more effective ways to do this involves lowering local tax rates. The concern that central governments have is that local tax rates can be set too low and public goods can be under-provided[11].

2.2 Fiscal Imbalance is a Consequence of Early Resolution Mechanisms

The early recommendation put forward by economists served, first, to ensure that public goods were not under-provided[12]. It required that each local jurisdiction provide local public goods for its residents because of superior knowledge about local preferences and costs.

The second recommendation was designed to ensure there was no 'race to the bottom' in setting local tax rates. It required that local governments administer taxes only when such taxes: (a) could be administered easily; (b) were levied solely or mainly on local residents; and (c) do not create problems of harmonization or competition with other local governments. The major revenue source that addressed these conditions was the property tax, with a secondary role for taxes on vehicles and user charges and fees. Over time, however, property taxes have proven inadequate for local governments. These governments have been unable to cover both operating and capital costs because tax proceeds have been too low for expenditure responsibilities (Blöchliger and Petzold 2009).

In order to address the mismatch between tax proceeds and expenditure responsibility, the early solution proposed in economic analysis was to use intergovernmental transfers to achieve a balance. Intergovernmental transfers were to serve three purposes. First, improve the overall tax system by ensuring that the level of government in the best position to administer a tax actually does. Second, redirect tax resources to the appropriate local government for services provided to citizens for which taxes could not be recovered by local authorities because they were not in the best position to administer the taxes. Third, ensure fiscal equalization by addressing horizontal imbalances across local governments (Oates 1999, Bird 2011).

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9   In public economics literature, the former is referred to as the "expenditure assignment problem," while the latter is referred to as the "tax assignment problem."
10 This is often referred to as "preference matching." Lockwood (2006) provides a good discussion.
11 Dhillon et al. 2007 provides a good discussion on this "race to the bottom."

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12 This is based on wide ranging analysis that comprise the traditional theory of fiscal federalism.

2.3 The Shortcoming of Intergovernmental Transfers in Addressing Vertical Fiscal Imbalance

More recent economic analysis indicates that intergovernmental transfers are an inappropriate policy tool for this balancing act[13]. This is because they create a 'transfer dependency' that undermines the incentives for sound fiscal behaviour (Rodden et al. 2003). The outcome has been fiscal imbalance throughout the Organization for Economic Co-operation and Development (OECD) with local governments worse off because of three factors: (a) legal constraints in generating their own revenue; (b) varying levels of dependence on intergovernmental transfers over time; and (c) central governments' influence on key expenditures such as wages and pensions.

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13 This more recent set of studies are described as comprising the new theory of fiscal federalism.

Economic analysis recommends two categories of reform. First, the role of intergovernmental transfers needs to be limited. A solid system of local taxation needs to underlie an effective system of intergovernmental transfers. Local authorities need to rely on their own revenue for financing at the margin so that decisions to expand public programs are made in the full light of additional costs. Second, the system of transfers must be transparent and predictable – the precise form of the transfers must be clear and suitable for the purpose (Inman 1988).

2.4 Increased Severity of Fiscal Imbalance Distortions in Large Cities

In the last 60 years, the growth of urbanization (the process of urban areas replacing rural ones) in Canada has been slower than the process of large cities replacing small urban areas. Specifically, over the 1951 to 2011 period, the share of Canadians living in urban areas has grown less rapidly than the growth in the share of

Figure 2.1 Intergovernmental Transfers are Inappropriate for Addressing Fiscal Imbalance

Focus of Economic Literature

- Convergence Benefits from Public Investment in Large Thriving Cities
- Optimal Assignment of Expenditure and Taxation Responsibility

Intergovernmental Transfers are Unsuitable for Fiscal Sustainability

- Tax Assignment
  - Legal Constraints on generating own revenue
  - Property Tax meets theoretical requirements but has limitations
- Expenditure Assignment
  - Varying dependence on intergovernmental transfers
  - Strong external influence on key expenditures
  - Additional public goods without revenue tools

Canadians living in Census Metropolitan Areas[14]. The growth in the share of Canadians living in large cities (minimum of 1 million inhabitants) has been even more rapid, increasing from 7 per cent to 35 per cent.

Large cities typically have deeper challenges with respect to infrastructure, transit, and logistics of a magnitude not shared by smaller urban areas (Courchene 2005). Further, as the principal immigrant and refugee receiving areas, large cities are often saddled with substantial settlement costs (language and skills training, income support, housing, etc). The large-city, high-cost structure for providing public goods and services is best articulated by Slack (2011): "A high concentration of people means, for example, more specialized police services; higher densities mean more specialized training and equipment for fire fighters. A high concentration of poverty and special needs within large metropolitan areas also requires higher expenditures on social services, social housing, and public health. Moreover, large cities compete on the international stage. To be competitive; they need to provide services such as parks, recreational facilities, and cultural institutions in addition to the 'hard' services such as transportation, water, and sewers."

Over time, the provision of a number of public goods has been transferred from the federal (local airports, local ports, local harbours) and provincial (transit, child care, social housing, social assistance, ferries, selected airports, property tax assessment) orders of government to local governments (TD Economics 2002). At the same time, revenue growth for Canadian local governments has been slow. For the most part, no additional revenue tools have been added to the local government's toolkit for the production of an expanded set of public goods and services[15].

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14 Statistics Canada defines urban areas as locations comprising at least 1,000 people and census metropolitan areas as those comprising at least 100,000 inhabitants. The share of Canadians living in urban areas increased from 62 per cent to 81 per cent, while the share of Canadians living in census metropolitan areas increased from 23 per cent to 60 per cent.
15 The Build Manitoba Fund which has bolstered local government revenue in Manitoba is a notable exception.

2.5 Convergence Benefits of correcting Large City Fiscal Imbalances

Increasing mobility of labour, capital, firms and goods across jurisdictions is an important feature of the Canadian economy. According to Statistics Canada (2012), about 1 per cent of the Canadian population (311,921) moved across provinces in 2012. The annual number of inter-provincial migrants has also fluctuated between 260,000 and 320,000 since 1991. Beginning in 1993, net international migration has been the main source of population growth in Canada with increasing concentrations of these immigrants settling in large cities. Also, Calgary experienced 100 per cent growth in the number of head offices over the 2002 to 2011 period.

Urban economics indicates that large cities benefit when people and firms locate near each other within cities in three main ways: (a) cost savings resulting from improved linkages between intermediate and final goods suppliers; (b) finer division of labour and more incentives for workers to invest in skills; and (c) spatially concentrated workers are able to learn from each other more easily. Empirical studies that quantify this benefit indicate that despite having huge urban costs, a doubling of city size is associated with a 2 to 20 per cent increase in productivity, so the benefits outweigh the costs (Overman et al. 2009, Behrens et al. 2012)[16]. High amenity cities also experience faster growth than low amenity cities (Glaeser et al. 2001). Some individuals strictly prefer larger cities because of these benefits and are willing to pay a premium to live in them.

Regional economics explains that long-term economic growth depends largely on technological progress and knowledge creation in a nation's hub cities. Empirical studies found that historical growth rates have been different at global, national and state or provincial levels. Some regions grew first and became leading

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16 These are based on estimates of agglomeration economies from production function analyses.

economies[17]. Others either lagged with lower growth rates or caught up with faster rates of growth. The "catch-up" in economic performance is called convergence, a phenomenon found at various geographical levels in numerous studies.

A regional economic study (Conference Board of Canada 2006) showed that intra-provincial convergence occurs in Canada between hub cities and the remaining communities in respective provinces. *The study also provided evidence of convergence in Alberta between hub cities (Calgary and Edmonton) and the rest of the province and called for strategic investment in these hub cities to promote long-term economic growth in the province.*

This finding supports the argument that public funding should promote growth in leading regional economies, because it is the most efficient way of using limited public funding, and the rest of the economy would

benefit from convergence[18]. In contrast, low investment in a leading hub city would hurt the provincial and national economies.

2.6 Findings from Previous Studies on Vertical Fiscal Imbalance and Canadian Municipalities

A number of studies have used economic analysis to explore the implications of vertical fiscal imbalance for some or all Canadian municipalities. There are six main findings from these studies:

- There is growing fiscal stress because local governments are providing larger quantities of public goods and services because of: (a) growth pressures; and (b) the transfer of responsibility for providing additional public goods and services from provincial and federal governments.

- The ability to provide these goods in required quantities is curtailed given the reliance on property

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17 In the case of leading cities, firms organize production and individuals organize their lives in these locations because there are increasing returns at the local level in contrast to constant returns at the national level (Rossi-Hansberg 2009).

18 Courchene (2005) explains that Canada's large cities are in the best position to serve as dynamic export and learning and innovation platforms and that the provision of local amenities is a crucial ingredient.

Figure 2.2 Positive External Benefits from Public Investment in Large Cities

Focus of Economic Literature

Convergence Benefits from Public Investment in Large Thriving Cities

Optimal Assignment of Expenditure and Taxation Responsibility

Public investment in Calgary will generate benefits for Alberta through convergence

Benefits to Calgarians

- Cost Savings from improved Linkages between intermediate and final goods suppliers
- Finer division of labour and more incentives for workers to invest in skills
- Spatially concentrated workers are more easily able to learn from each other

Benefits to other Albertans

- Some regions grow first and become leading economies
- Other regions experience "catch up" in economic performance
- Evidence supporting rest of province catching up with Calgary and Edmonton

taxes as the main revenue source. Property taxes have been increasing but are not fully responsive to prevailing economic conditions.

- The outcome has been a combination of public goods provided below optimal levels and a transfer of the burden of financing into the future through debt accumulation to finance capital projects.

- Substantial taxation is already imposed on local taxpayers but a decreasing proportion of this accrues to local governments.

- The provincial and federal governments' emphasis on applying substantial portions of revenue toward redistribution across municipalities rather than spurring economic activity in large cities could harm Canada's economic prospects.

- Large cities should have access to a portfolio of taxes that would be stable (through property taxes) and will also grow with the economy (through income, sales or business taxes).

Figure 2.3: Highlights from Existing Literature on Vertical Fiscal Imbalance and Canadian Municipalities

|	Author, year	Study Region	Study Specific Findings
1	TD Economics, 2002	All Canadian cities	• There is fiscal stress on local governments given rapidly expanding responsibilities. • Local governments rely increasingly on property taxes, which have proven insufficient to meet spending requirements. • Local governments find themselves facing a trade-off between delaying spending, reducing services and financing major projects through expected future income.
2	The Toronto Board of Trade, 2002	Toronto	• Toronto's local government relies increasingly on property taxes, which has been insufficient to meet spending requirements. • Very little of the already high taxation on local taxpayers accrues to Toronto's local government.
3	K& L Consulting, 2003	Calgary	• Very little of the already high taxation on local taxpayers accrues to Calgary's local government.
4	Federation of Canadian Municipalities, 2006	All Canadian municipalities	• Local governments find themselves facing a trade-off between delaying spending, reducing services and financing major projects through expected future income.
5	Ronald Kneebone, 2007	Nine Canadian Cities: Toronto, Montreal, Vancouver, Ottawa-Gatineau, Calgary, Edmonton, Quebec, Hamilton, and Winnipeg	• Very little of the already high taxation on local taxpayers accrues to local governments in Canada's major cities. • Failure to spur economic activity in large cities could harm Canada's economic prospects.
6	Casey G. Vander Ploeg, 2008	Six Canadian cities – Calgary, Edmonton, Regina, Saskatoon, Vancouver, Winnipeg	• There is fiscal stress on the large local governments in Western Canada given rapidly expanding responsibilities. • Local government authorities in these cities rely increasingly on property taxes which have proven insufficient to meet spending requirements.
7	Enid Slack, 2011	All Canadian municipalities	• Large cities should have access to a portfolio of taxes that are stable and also grow with the economy.

3.   Methodology

3.1   Determining Expenditures and Revenue in Calgary by the various orders of Government

In order to estimate the contribution of Calgarians to the net financial position of each order of government over the 1991–2013 period, spending levels on Calgarians and the Calgary economy by each order of government were compared with revenue collection from Calgarians and the Calgary economy[19].

Statistics Canada currently produces aggregated government financial statistics for the federal government, all provincial governments and all local governments for Canada as a whole[20]. This is a departure from past practices when disaggregated government financial statistics were made available for each province. The previous database provided expenditures and revenue data for Alberta. The task for analysts was to determine an appropriate mapping mechanism to identify the tax revenue generated within Calgary by the three orders of government and the expenditures that these governments incurred to deliver public services to Calgarians (figure 3.1).

Using the current government financial statistics, analysts at the Conference Board of Canada generated government financial statistics for Alberta. The method for parsing, or mapping data from Canada to Alberta required initially identifying the appropriate base

for economic activities that generate revenue and the recipient base for public spending. Next, the relevant historical shares of Alberta's finances relative to all Canadian provinces were used to determine Alberta provincial revenue and expenditure line items. Figures 3.2 and 3.3 provide summary representations of the mapping process for provincial revenue and expenditure line items from the national data. This procedure was also applied to obtain provincial estimates of revenue contributions from or to the other orders of government and provincial expenditures on their behalf. Appendix

Figure 3.1 Estimating Net Financial Contribution from Calgarians to the Three Orders of Government

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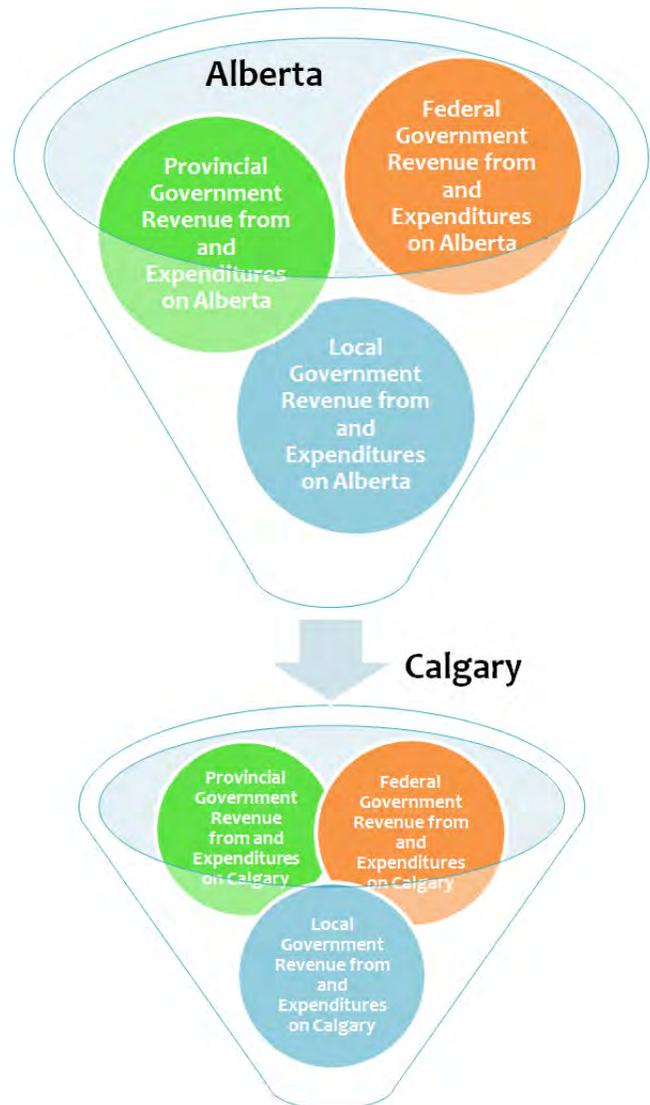
19 This comparison is appropriate if the data is adjusted for differences in accounting and reporting practices. Statistics Canada generally adjusts data so that comparisons can be made across time and by order of government.

20 The current financial statistics for Canada provide the following: taxes on income; taxes on production and imports; contribution to social insurance plans; other current transfers to households, other current transfers from non-profit, current transfers from other general governments, other transfers from non-residents, investment income, sales of goods and services and capital transfers. On the expenditure side, the allocation of expenditures are: gross current expenditures on goods and service, current transfers to households, current transfers to non-profits, subsides, current to general governments, current transfers to non-residents, capital transfers, interest on debt, acquisition of non-financial capital, fixed capital consumption and net transfers.

3. Methodology

Figure 3.2 Determining Alberta Provincial Government Revenue

Data for All Provinces (Government Financial Statistics)	Allocation Basis (Data on Tax/Revenue Base)	Derived Estimates for Alberta (Conference Board of Canada)
	Office Space	Corporate taxes
	Capital Gains	Investment Income
	Personal Taxes	Household Taxes
Total Provincial Government Revenue	Employment	Contributions to Social Assistance
		Taxes on Production and Imports
	Population	Government Transfers
	Emigration	Non-Residential Taxes

Figure 3.3 Determining Alberta Provincial Government Expenditure

Data for All Provinces (Government Financial Statistics)	Allocation Basis (Data on Spending Beneficiaries)	Derived Estimates for Alberta (Conference Board of Canada)
	Direct Beneficiaries	Unemployment Insurance
	Total Population	Gross Current Expenditures on Goods and Services
Total Provincial Government Expenditure		Interest on Debt
		Subsidies
		Government Transfers
	Population above 64	Old Age Benefits
	Population below 15	Child Tax Credit and Benefits

A Case of Vertical Fiscal Imbalance -
The Calgary Experience (*An Update)*

3. Methodology

A of this report contains a note from the Conference Board of Canada with more details on the methodology.

The same method for parsing was applied to the Alberta financial statistics generated by the Conference Board of Canada to estimate government financial statistics for Calgary[21]. These statistics enable the determination of each order of government's net contributions to Calgarians and the Calgary economy. The net contribution by each order of government in Calgary is defined as the difference between revenue collected from Calgarians and expenditures made by that order of government in Calgary[22].

3.2 The Responsiveness of Current and Potential Revenue Sources to Macroeconomic Conditions

Statistical analysis was used to determine how revenue and expenditures respond to economic and population growth[23]. The result provides a basis for determining whether the net financial contribution increases or decreases in response to changes in economic and demographic activity.

3.2.1 Property Taxes and Other Current Sources of Revenue and Economic Growth

Property taxes play a significant role in revenue generation for local governments, and are required to cover a higher local government spending bill during periods of economic expansion. To verify the extent to which property taxes respond to the level of economic activity in Calgary, this study estimated the statistical relationship between property tax levies and two indicators of the level of economic activity – real GDP and population. The statistical results indicate whether a change in economic activity will generate a more or less proportionate change in property tax revenue.

Also considered was the relationship between total local and provincial government revenue on the one hand and the level of economic activity on the other. This was used to determine if the contribution of non-property tax revenue sources were sufficient to alter the level of responsiveness of local and/or provincial revenue to the level of economic activity[24].

3.2.2 Income, Payroll and Sales Taxes and Macroeconomic Conditions

The analysis was extended to consider whether other sources of tax revenue, not currently available to Alberta local governments, are responsive to the level of economic activity in municipalities. This study looked at the statistical relationship between each of three alternative sources of tax revenue – payroll taxes, income taxes and sales taxes – and the level of local economic activity as measured by the value of real GDP and population size[25]. The same analysis was repeated

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21 An example of revenue mapping is determining the portion of taxes paid by the Calgarians from the Alberta data. To do this, we consider the share of taxes from Canada Revenue Agency for Calgary Census Metropolitan Area (CMA) relative to Alberta. This share is then resized to reflect the fact that the city of Calgary is a part of the Calgary CMA. An example of the mapping on the expenditure side is determining current transfers to households in Calgary. Current transfers to households include employment insurance, old age security, child tax benefits and universal childcare benefits, and other current transfers to persons. To allocate employment insurance we use the employment shares from Calgary Economic Region (CER) and correct for the city of Calgary using the same method we highlighted above for revenue. To allocate old age security we use the shares of the over 64 population for the city of Calgary. To allocate child tax benefits we employ the shares of the under 15 population of the city of Calgary, and for the other current transfers to persons we employ the share of Alberta's population that resides in Calgary.

22 This difference between revenue and expenditures net of capital spending plus fixed capital consumption defines what we term net financial contribution.

23 The system of equations also controlled for debt per capita, inflation, and prior year revenue. Prior year revenue is included because this influences current period decisions on spending.

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24 The model specifically looks at the relationship between each of property tax revenue and total revenue on the one hand and a number of indicators of economic activity on the other. These indicators are: GDP, interest on debt per capita, population, and expenditures.

25 This analysis used quarterly tax revenue data from Statistics Canada for the federal government, the provincial government and the combined provincial and federal government.

using the level of provincial economic activity. The estimates generated for the Calgary local government were also compared with Alberta provincial government estimates to determine if these sources of tax revenue had the same or different sensitivities to economic activity in Calgary and Alberta. Whenever the statistical estimate is higher for Calgary, the relative impact is considered to be higher in Calgary than in Alberta.

4.   Data Analysis and Findings

## 4.1   Expenditure and Revenue Shares for The Three Orders of Government

The local government's share of total government revenue raised in Calgary has been shrinking. It fell from 15.5 per cent in 1991 to 13.5 per cent in 2013 (figure 4.1). The federal government, on the other hand, saw its share of revenue raised in Calgary increase from 38.6 per cent to 45.7 per cent. Like the local government, the provincial government experienced a decrease in its share of revenue from 45.9 per cent to 40.7 per cent.

Current expenditures in Calgary from the provincial government and the local government have steadily increased over time. The local government's share of current expenditures increased from 16.7 per cent in 1991 to 18.9 per cent in 2013 (figure 4.2). At the same time, the share of current expenditures incurred on Calgarians by the provincial government increased from 46.0 per cent to 55.4 per cent. The federal government saw its spending on Calgarians and the local Calgary economy drop from 37.2 per cent to 25.7 per cent.

This historical pattern of a decreasing share of government revenue and an increasing share of current government expenditures for the Calgary local government relative to the other orders of government makes the case for rebalancing revenue generation tools across the three orders of government compelling. The alternative approach of rebalancing responsibilities for current expenditures, by reducing local government responsibilities, would be less appropriate given that providing local public goods and services is better handled by the order of government closest to the people. The rebalancing exercise can be structured to put the Calgary local government on a path toward sustainably providing public goods and services to local residents with available revenue tools.

The share of spending on tangible capital assets has similarly increased for the provincial and local governments. This is because expenditures on tangible

Figure 4.1   Revenue Shares for the Three Orders of Government
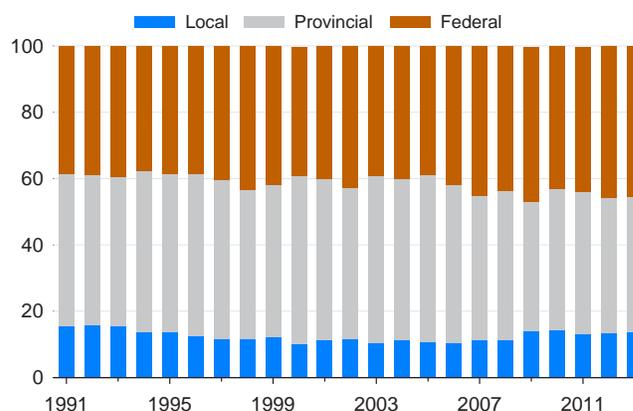
Source: Statistics Canada, Corporate Economics.

Figure 4.2   Current Expenditure Shares for the Three orders of Government
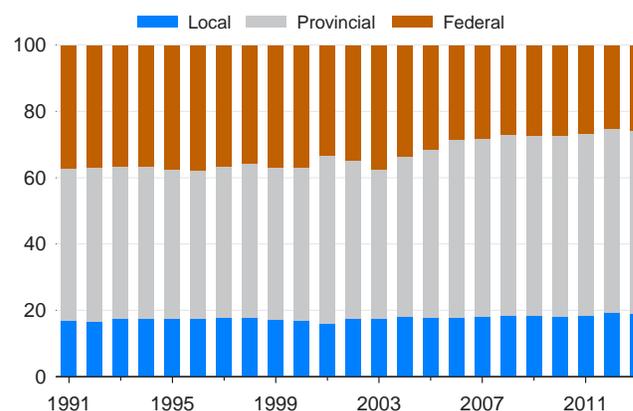
Source: Statistics Canada, Corporate Economics.

capital assets by the local and provincial orders of government on Calgarians increased at average annual rates of 7.5 per cent and 6.9 per cent respectively. Meanwhile, the federal government's share of spending on tangible capital assets has fallen because of a slower average annual growth of 2.2 per cent.

Despite larger increases in capital spending by local and provincial governments, the share of total government debt interest payments made by these orders of

government has fallen. This is attributable to a sharp decline in interest rates. This interesting trajectory of the share of interest payments on debt further highlights the fiscal responsibility of Calgary's local government. When money is cheap (interest rates are low), and employment growth is relatively strong, the cost of infrastructure becomes relatively more affordable, enabling a rapidly growing city the opportunity to expand infrastructure.

4.2 Estimates of Net Financial Contributions

The estimates of revenue and expenditures by the various orders of government in Calgary revealed that the net financial contribution to the provincial and federal governments by Calgarians was positive for most or all of 1991-2013[26]. Calgarians therefore, made a positive contribution to both the province and nation's financial well being regardless of the phase of the business cycle.

4.2.1 Net Financial Contributions by Calgarians to the three orders of Government[27]

The analysis of net financial contributions incorporated intergovernmental transfers to the Calgary local government as part of the spending on Calgarians by the federal and provincial governments. Between 1991 and 2013, the net financial contribution by Calgarians to the federal government grew from $870 million to $11.6 billion. This is an average annual growth rate of 6.7 per cent. Consequently, the gap between revenue and expenditures has grown at an increasing rate over time (figure 4.3).

Calgarians have also consistently made a positive net financial contribution to the provincial government. In

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26 There is one exception. It was negative for the provincial government in 2009.

27 The net financial contribution by Calgarians to the orders of government is defined as the difference between total revenue and current expenditures, plus fixed capital consumption net of net capital spending.

Figure 4.3   Federal Revenue from and Expenditures on Calgarians

Billions of dollars
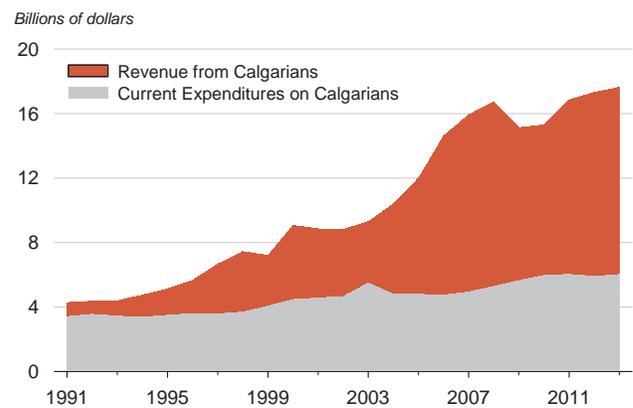
Source: Statistics Canada, Corporate Economics.

Figure 4.4   Provincial Revenue from and Expenditures on Calgarians

Billions of dollars
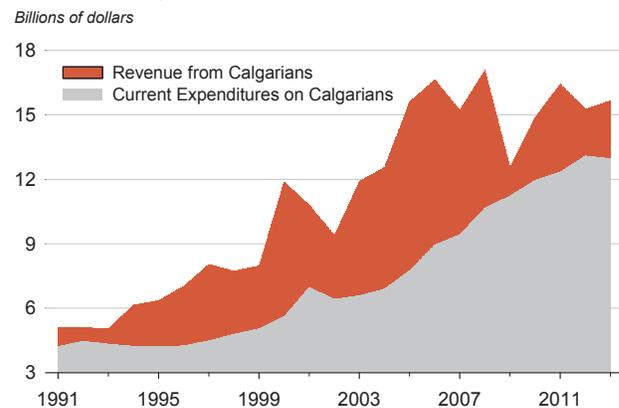
Source: Statistics Canada, Corporate Economics.

Figure 4.5   Financial Net Contributions to the Local Government by Calgarians
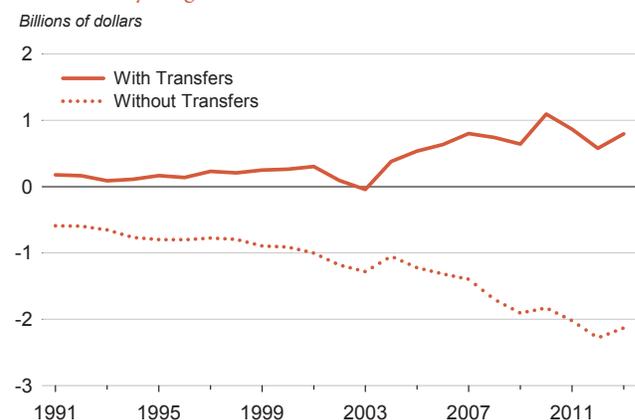
Billions of dollars

Source: Statistics Canada, Corporate Economics.

1991, the net financial contribution from Calgarians to the Alberta provincial government was $883 million. By 2013 it had increased to $2.7 billion (figure 4.4).

The Calgary local government spends more than it receives from Calgarians. Fortunately, the Calgary local government sector has recouped sufficient amounts through intergovernmental transfers to cover the shortfall. Unfortunately, the dependence on intergovernmental transfers has increased over time and highlights the local government's financial vulnerability to provide services to its citizens (figure 4.5).

The high growth in expenditures, induced by the demands of increased economic and population growth along with inflationary pressures and strong growth in regional amenities has caused revenue to lag further and further behind expenditures. This has made the provision and sustainability of public goods and services delivered by the local government increasingly challenging. Between 1991 and 2013, the average annual growth of expenditures was greater than the average annual growth of revenue. Specifically, expenditures grew at an average annual rate of 5.2, while average annual revenue growth was 4.0 per cent.

The growth in capital spending has outpaced the growth of revenue, and therefore can only be financed through intergovernmental transfers and borrowing. The issue of capital spending is a substantial element in the sustainability of any city's growth.

The availability of resources to finance capital expansion projects in Calgary is closely related to the size of intergovernmental transfers received[28]. The resource requirement for capital expansion projects related to wastewater and drainage, roads, transit, fire stations, parks and libraries is great. This is demonstrated in a faster average annual growth rate for capital spending (10.0 per cent) than for intergovernmental transfers (8.1 per cent) between 2003 and 2013 (figure 4.6).

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28   Between 1991 and 2002, the average annual growth rate of intergovernmental transfers was 4.3 per cent. For the same period, the average annual growth rate of capital spending was 7.0 per cent.

Figure 4.6   Capital Spending and Intergovernmental Transfers

Billions of dollars
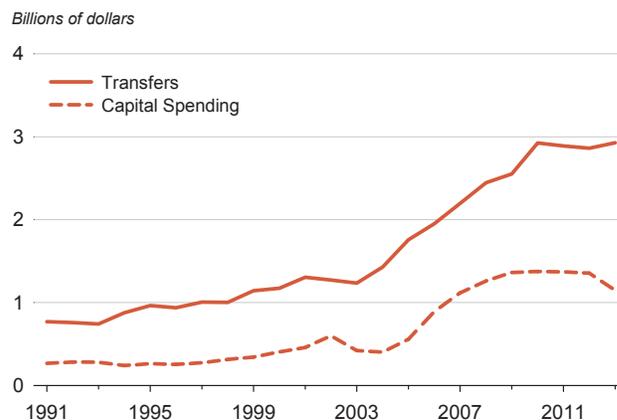
Source: Statistics Canada, Corporate Economics.

4.2.2   Net Financial Contributions by Albertans to the Provincial and Federal Governments

Albertans in general have made large positive net financial contributions to the federal government. In the first two years of the study period (1991-1993), Albertans contributed a negative amount per capita, thus receiving more money than they handed out to the federal government. Subsequently, the net financial contribution per capita by Albertans to the federal government grew at an average annual rate of 16.7 per cent per year from $206 in 1993 to $5,266 in 2013. The average contribution made by Calgarians has been much higher (increasing from $1,318 in 1993 to $10,038 in 2013) but has grown more slowly (10.2 per cent)[29]. Although the Calgary average has been

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29 In February 2012, the Government of Alberta published a study on vertical fiscal imbalance in its "Fiscal Spotlight" report. Using data for 2011, the report indicated that Albertans made a net contribution to the federal government of $18.9 billion or $5,012 per person. That estimate is comparable to the estimate of $4,759 per person obtained using this report's methodology. The analysis that was conducted focused on vertical fiscal imbalance between provincial and federal governments and did not consider municipalities. This report extends the analysis to ensure that the plight of local governments is considered. The Fiscal Spotlight report also indicated that in 2009, Alberta was the only province in Canada with a positive net financial contribution to the federal government.

consistently larger than the Alberta average, there is regional convergence with faster growth of net financial contributions from other Alberta jurisdictions to the federal government (figure 4.7).

The evidence is similar for the net financial contribution made by the average Albertan to the provincial government when compared with the net financial contribution made by the average Calgarian. Between 1993 and 2013, the positive net financial contribution made to the provincial government by the average Albertan increased from $403 to $1,783. This is an average annual growth rate of 10.4 per cent. Calgarians, on the other hand, made much higher contributions which have increased at a slower average annual rate of 5.9 per cent from $2,585 to $6,127 (figure 4.8).

4.3 Responsiveness of Revenue and Expenditures to Calgary's Changing Economic Profile

4.3.1 Total Expenditures and Revenue Responsiveness

Statistical analysis on the responsiveness of expenditures and revenue to changes in Calgary's demographic and economic size were also considered. The analysis ensured that the influence of changing prices, indebtedness and other factors did not confound the results. The results confirmed that both expenditures and revenue were responsive to Calgary's growth. However, expenditures were more responsive to changes in Calgary's demographic and economic size.

4.3.2 Responsiveness of Property Tax Revenue

The statistical analysis also confirmed that property tax revenue was unresponsive to changes in Calgary's demographic and economic size[30].

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30 Specifically, the results showed that a 1 per cent increase in GDP is associated with a 0.07 per cent increase in property taxes. In addition this estimate is not statistically significant, even at the 20 per cent level of significance.

Figure 4.7   Net Financial Contribution to the Federal Government

Thousands of dollars per person
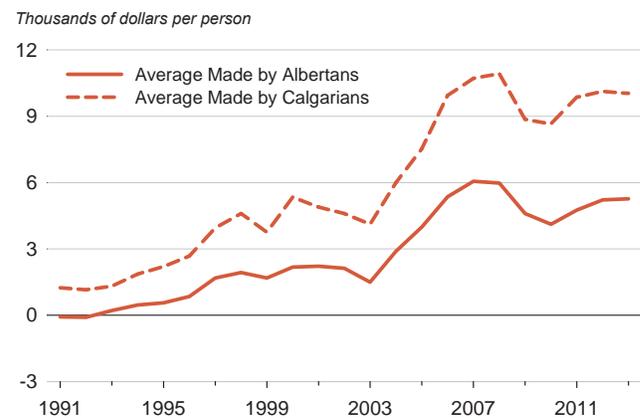
Source: Statistics Canada, Corporate Economics.

Figure 4.8   Net Financial Contribution to the Provincial Government

Thousands of dollars per person
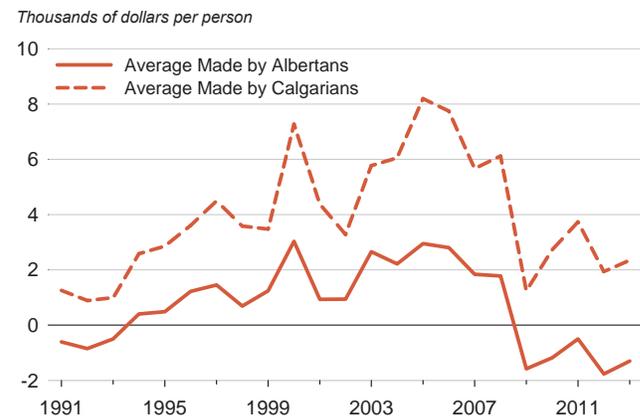
Source: Statistics Canada, Corporate Economics.

This finding can partly be attributed to the fact that pass-through from economic growth to an expansion of the property tax base is indirect. Economic activity affects the property tax base only when such activity affects the size of the real estate inventory and its associated value. Some types of activities, while adding to the city's overall economic activity, may not significantly affect the real estate market. For example, sporting events would add to economic activity by increasing consumer spending, but do not have any direct or meaningful impact on real estate values. In fact, temporary or occasional activities do not translate into the need for permanent structures and therefore do not affect the size of the tax base.

Perceived shortcomings of Property Taxes

- Real estate transactions typically occur infrequently and on a fraction of total properties in a municipality, therefore the property tax must be levied on an estimated value. If this estimate is perceived as inaccurate, the tax is perceived as unfair .

- The property tax is highly visible, so taxpayers are aware of any increases in their property tax bills. In contrast to the federal and provincial income and payroll taxes which are deducted at source, property tax is often paid directly by the taxpayer. Moreover, the payments are often made on a lump-sum amount, so each payment comes as a large shock.

- Property tax is perceived as a regressive tax, partially a consequence of the "traditional view" of the tax which continues to dominate public debate, and which is reinforced by the fact that some property owners, particularly the elderly, do not have enough cash to make payments and may therefore be forced into selling their homes.

- Taxpayers may feel that they are powerless to do anything about other taxes, but have some power in deciding property tax because they are closer and have better access to the local government.

- Property tax revenue for Alberta municipalities is the balancing item in the municipal operating budget. After budget estimates of current expenditure and non-property tax revenue are determined, the shortfall is to be addressed using property tax revenue. This is the principle of revenue neutrality and has two features. First, the pace of current expenditure growth is the primary driver of revenue growth. Second, changes in assessed property values that typically reflect local economic activity are of little consequence because the property tax rate is merely adjusted to achieve the desired property tax revenue.

An additional explanation has been provided by Rosen et al. (2008). Property tax is a tax on wealth, a stock variable that refers to the value of the assets an individual or a business has accumulated at a point in time. In Canada, property taxes are levied on assessed values of local properties. The amount of property tax revenue collected is not closely related to the personal circumstances of individual taxpayers. In the case of property taxes on homeowners, the tax may not accurately reflect the income of the homeowner[31]. Instead, it is based on the gross value of the real estate. By comparison, income, payroll, and sales taxes are levied on flow variables that are associated with a certain period of time, so overall economic conditions contribute to the amounts of these tax revenue. In addition, the revenue neutrality requirement for Alberta municipalities also contributes to the insensitivity of property taxes to changes in economic conditions.

4.4   Provincial and Federal Revenue Benefits arising from Growth in Calgary

With the confirmation that Calgary makes an above Alberta average contribution to the various revenue streams for provincial and federal governments, the analysis was extended to cover two other considerations[32]. The first was to assess the responsiveness of all income, payroll and sales taxes received by the provincial and federal orders of government to economic and population growth in Calgary[33]. These revenue sources are currently available to the Alberta provincial government and the federal government but not the local government. The results showed that all three taxes were responsive to changes in demographic and economic size. Also, the estimates were statistically significant.

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31 Retirees are a good example of homeowners whose property tax payments do not reflect current income.

32 This is based on an aggregation of the federal and all provincial governments in Canada.

33 This is based on quarterly data from the first quarter of 1991 through to the fourth quarter of 2013.

The second consideration was to determine which of the three revenue sources the average Calgarian made more contributions to compared with the average Albertan. The difference between the average contribution of Calgarians and Albertans was largest for total sales taxes. The difference between the average contribution of Calgarians and Albertans to total income taxes and total payroll taxes was very similar.

For the part of income, payroll and sales taxes that are received by all Canadian provincial governments, the results indicate that the difference between the average contribution of Calgarians and Albertans was greatest for provincial income taxes. This was followed by provincial sales taxes. The average contribution by Calgarians to provincial payroll taxes was much closer to the average contribution by Albertans.

The fundamental problems with reliance on intergovernmental transfer payments

One of the key issues with the Calgary local government's current fiscal toolbox is the dependence on intergovernmental transfer payments for major discretionary expenditures. As it stands, large infrastructure projects such as LRT expansions are generally funded by lump sum transfers from other levels of government. The difficulties with the existing system are three fold:

- **The allocation of the funds is dictated by the level of government providing the transfers, rather than by The City.** As stated in Section 2, local governments are best suited for providing local public goods for its residents because of superior knowledge regarding local preferences and costs. In the case of intergovernmental transfers, the local government is unable to control where the funds are directed. Instead, a higher order of government determines the priorities, in spite of the fact that it has less knowledge about local residents' needs and preferences. There is significant risk that decisions will be made with political motivations in mind, meaning that high priority projects can be set aside in favour of politically popular endeavours.

- **Lump sum transfers do not include funds for increased operating costs.** While the Calgary local government may receive the money required to build a LRT line, for example, the funds required

for the day-to-day operations of the train are the responsibility of the local government. In order to pay for new employees, increased electricity use, etc. the local government must look to existing and increasingly overextended revenue tools.

- **The uncertainty created by dependence on transfers undermines The City's ability to make long term plans.** Ideally the local government would be able to plan for growth several years down the line and budget for necessary expenditures accordingly. However, transfer payments are rarely guaranteed, and can be altered or taken away at the whims of the other orders of government. Furthermore, transfers are not sensitive to economic conditions or population growth, compounding the difficulties in meeting the future needs of residents. Because intergovernmental transfer payments cannot be completely counted on, there is a large degree of unnecessary uncertainty imposed upon city planners.

If existing tax revenues were redistributed to enable the Calgary local government raise funds more consistently and reliably, the local government would be better able to make long term plans to deliver the appropriate public goods to residents. This would result in a more efficient use of taxpayer dollars without increasing the tax burden on residents.

5. Implications and Conclusion

The inflow and outflow analysis reveals that a vertical fiscal imbalance exists between Calgary's local government and the other two orders of government (figure 5.1). Specifically, the analysis shows the following:

▪ Calgarians consistently remit more revenue to the federal government than they receive from the federal government in expenditures[34]. Further, the gap between revenue and expenditures increased over the course of the study period.

▪ The net financial contribution to the Alberta provincial government by Calgarians was also positive.

▪ Before including intergovernmental transfers, the net financial contribution by Calgarians to the local government has been negative. It is only with the inclusion of intergovernmental transfers that the net financial contribution turns positive.

▪ Property tax revenue is rather unresponsive to economic growth because it is designed to address the gap between expected operating expenditures and non property tax revenue. This has led to a reliance on intergovernmental transfers to meet capital expansion costs.

▪ Intergovernmental transfers have proven to be an insufficient tool for resolving fiscal imbalance and local policy makers require different tools to deliver local public goods.

Figure 5.1 Net Financial Contribution from Calgarians to the three orders of Government

Index, 1991 = 100
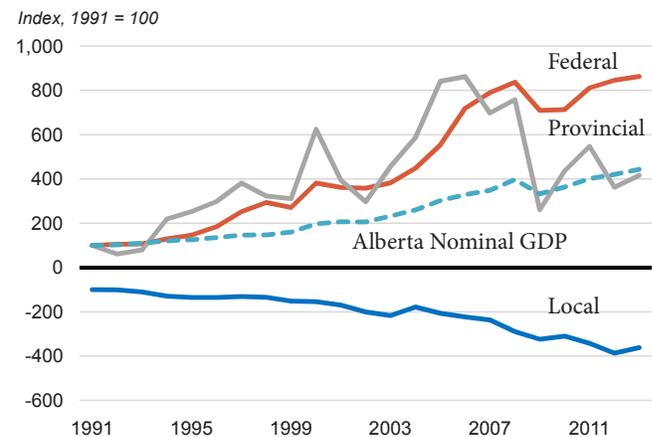
Source: Statistics Canada, Corporate Economics.

Local government revenue in Calgary is less responsive to changes in population and GDP than local government expenditures. The statistical analysis shows no statistically significant change in revenue whenever there is a unit increase in GDP. This result further highlights the lack of a strong correlation between current revenue generation for the local government and economic growth. The results show that expenditures respond more to a unit increase in population or inflation than revenue. The implication is that economic growth does not readily translate into revenue growth. In turn, this implies an ever increasing reliance by the Calgary local government on intergovernmental transfers to meet its expenditure needs. The fact that the federal or provincial governments can cut or stop transfers at their choosing, especially during trying times, leaves the Calgary local government exposed to the whims of the provincial or federal government.

Property tax revenue, The City of Calgary's primary revenue source, is also unresponsive to changes in economic conditions. The relationship between property tax revenue for Calgary's local government and indicators of the level of local economic activity (such as population and GDP) was estimated. There was also no statistically significant change in property

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34 Intergovernmental transfers from the federal to the local government were considered as part of federal government spending in the municipality.

tax revenue for a unit change in GDP. This result further highlights the weak correlation that exists between revenue and economic growth, given that property tax levy is the most significant revenue component of local government revenue. These statistical results were expected because the municipal government is bound by a revenue neutrality criterion. This criterion requires that property tax revenue covers the current expenditure shortfall not covered by non property tax revenue, rather than respond to the level of local economic activity as captured by assessed property values. The property tax rate is adjusted annually to ensure that this revenue neutrality criterion is met.

Calgary is a major Alberta hub city generating benefits that extend to the national level through revenue streams such as income taxes, sales taxes and payroll taxes. Canadian government revenue from income, sales and payroll taxes is more responsive to changes in the level of economic activity in Calgary than it is to changes in Alberta's level of economic activity. This result validates the identification of Calgary as a vital Alberta hub city that generates high levels of employment, incomes and consumer purchases.

The Vertical Fiscal Imbalance can hinder future prosperity. Hub city economies are key components in Canada's current and future economic prosperity. This success is linked to their ability to compete with other international cities by attracting and retaining capital and skilled talent. "Municipal governments have an important role to play in this regard. As city governments are responsible for providing many of the services that make a city globally competitive – serviced land, an efficient transportation system, public safety, potable water, recreation facilities, a culturally diverse and tolerant social environment, and etcetera – their fiscal capabilities are of paramount importance. An inability of city governments to finance these investments in social infrastructure, via an efficient system of revenue will cause not only the economies of cities to stagnate but also that of the provinces and the nation."(K & L Consulting Inc. 2003).

6. Recommendations

The City's financial outlook is aptly summarized by the following quote from its long range financial plan, "The City is facing significant financial challenges. The state of municipal finance is such that opportunities to raise additional revenue and funding from new or existing sources are extremely limited. The City's main source of revenue is derived from property tax, which has proven to be inflexible and inelastic. Other internal sources of revenue such as the business tax and sales of goods and services also present limited growth potential. Funding from other orders of government is at their discretion and is subject to change or elimination as provincial and federal agendas evolve" (The City of Calgary, Long Range Financial Plan 2011).

The City's financial problems are systemic. The data analysis and related findings in section 4 show that total revenue, particularly property taxes, is relatively less sensitive to economic growth compared to total expenditures. Economic growth causes the system to experience financial stress. The statistical analysis reveals the weak link between property tax revenue and economic growth. This is because revenue neutrality requires that property tax revenue be set to equal the difference between budgeted current expenditures and budgeted non-property tax revenue. Increases in assessed property values reflecting local economic activity are of little consequence in determining property tax revenue[35].

The recommendation is to remain revenue neutral from the point of view of the taxpayer and grant a different basket of revenue generating tools to municipal authorities that includes revenue sources that are more sensitive to the prevailing economic conditions in municipalities. Specifically, the suggestion is for intergovernmental transfers to be de-emphasised

in favour of growth sensitive revenue sources. This will ensure that there is no change in the effective tax rate. The provincial and federal governments can help Calgary's local government by granting a different set of revenue sources - those that grow with the economy to replace some of those that do not[36] .

The federal and Alberta provincial governments have both experienced improved public finances since the mid 1990s, partly due to the downloading of responsibilities to local governments in order to reduce their expenditures. This is in addition to benefiting from revenue sources that are sensitive to economic growth. The federal government achieved budget surpluses beginning in 1997 up to the 2008-2009 recession due to continuous increases in total revenue and real declines in total current expenditures. In the same period, the Government of Alberta also maintained surpluses due to the rapid growth in total revenue and relatively slow growth in total expenditures.

From the mid-1990s through to 2007, the two orders of government were able to reduce their net financial debt levels (or accumulated deficits) significantly. In Alberta's case, the provincial government paid off all its debts by 2004 and had a surplus of $35 billion dollars by the end of the 2007 fiscal year.

The federal and provincial governments both entered the 2008-2009 recession with strong fiscal positions and thus fared better than almost all other major industrialized countries. Although both orders of

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35 The "Guide to Property Assessment and Taxation in Alberta" published by Alberta Municipal Affairs provides a comprehensive discussion on revenue neutrality. It is available at http://www.municipalaffairs.alberta.ca/1538.cfm

36 The precedent for revenue sharing is Manitoba. In the past, the province of Manitoba shared 2.2 per cent of all personal income tax revenue with municipalities. This has been replaced by the Build Manitoba Fund. Municipalities benefit from a share of provincial tax revenue. The amount to be credited to the BMF is set in legislation, equivalent to the greater of:
- One-seventh of provincial sales tax revenue;
- 4.15% of provincial personal and corporate income taxes estimated for the year;
- 2 cents per litre of provincial gasoline tax estimated for the fiscal year; and
- 1 cent per litre of provincial diesel fuel tax estimated for the fiscal year.

More information on this revenue sharing arrangement is available at the following link - http://web5.gov.mb.ca/mfas/grants_payments_fund.aspx

government ran deficits during the recession and beyond to support the national and provincial economic recovery, they have now returned to balanced budget positions.

The return of economic growth to the national and provincial economies will result in increases in government revenue over the next few years and strengthen the ability of federal and provincial governments to balance their budgets without inhibiting their current low tax policies.

All orders of government represent the same taxpayer. The different orders of government may have different responsibilities but their interests are complementary: they serve the same citizens and work toward a common goal of providing a high standard of living. A municipal government is often the only government presence in a region and is responsible for the delivery of most locally needed public goods and services and infrastructure investments. Therefore, it is under increasing pressure to raise more revenue to fund services and investments arising from the effects of population growth. The City of Calgary, like other municipalities, faces significant challenges while balancing competing priorities such as investing in new capital projects, replacing or upgrading old infrastructure, and increasing operational budgets to meet growth in service needs during economic boom times.

Since the recent economic recession, revenue has increased by less than the increase in the demand for local services. In response to these challenges, The City of Calgary has used financial reserve funds as a buffer between peaks and valleys, and has borrowed heavily in capital markets to address capital funding gaps. These measures are temporary in nature and are not sustainable over the long run. The City's fiscal problems are systemic and a permanent fix would require the provincial and federal governments to change the rules under which The City operates.

The strong fiscal positions of the federal and provincial governments also provide the necessary capacity to help big cities like Calgary by granting them different revenue sources. In evaluating options for additional

funding for municipalities, the risk of raising the already high overall tax burden on taxpayers must be considered, because as often noted "**there is only one taxpayer**" and the tax room is limited. A preferred scenario for taxpayers is that there should not be an increase in their total tax bill. Additional funding for municipalities should not increase the tax burden on tax payers.

After experiencing long wait times for new infrastructure investments to start during the boom, a significant portion of Calgary's businesses and residents are increasingly reluctant to pay more taxes. Calgary's persistent inability to meet its expenditure obligations without intergovernmental transfers suggests a strong reliance on the other orders of governments, especially the provincial government, and exposes the shortcoming in the existing vertical fiscal structure[37].

Given the growth of positive net financial contribution by Calgarians to the federal government, and positive net financial contribution to the province, The City of Calgary finds itself in persistent stress without intergovernmental transfers, suggesting that a method which allows for additional revenue generation equivalent to the intergovernmental transfers can be designed to alleviate The City's chronic dependence on discretionary intergovernmental transfers[38].

The analysis shows that income taxes, sales taxes and payroll taxes are all growth sensitive and a policy fix could incorporate these as components to address The City's long term ills. Specifically, The City could share these tax bases with either the provincial or federal government or both in exchange for transfer payments.

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37 This shortcoming is because of the financial inability to provide goods and services despite a relatively strong (tax) payer base.
38 There is a risk that the federal or provincial government can choose not to commit to any transfers and that this could happen when local governments need it the most.

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Appendix A: Detailed Description of the Methodology[39]

The estimates are broken down into three main categories: Federal government, provincial government, and the combination of local and aboriginal governments. By combining local and aboriginal governments we can keep the same broad groupings as were previously presented in the provincial economic accounts (PEA), which are discontinued on a provincial basis.

Although the new accounts from Statistics Canada only report revenue and expenditure on a national basis, provincial level data can be estimated applying the relevant historical shares of Alberta's fiscal finances relative to the Canadian total from the PEA. This first requires mapping the respective categories under the new account system to the PEA, and the second requires extending these shares beyond 2009 when the PEA data ends.

Many of the categories have direct corollaries from the new account system to the PEA. For example, table 380-0080 reports taxes on incomes from households, which is analogous to direct taxes from persons in the PEA. Thus, by taking Alberta's share of direct taxes paid relative to the national total from the PEA and then applying that to the new data provided by STATCAN, estimates similar to those in the discontinued PEA can be created. This process was recreated for each variable that a direct link between the PEA and the new account system was available.

Some definitional changes have occurred that required adjustments, most notably the new gross current expenditure on goods and services category. Previously, Statistics Canada reported only on net current expenditures so to keep this consistent, the new revenue category "sales of goods and services" is subtracted from the "gross current expenditures". Then, the old PEA share applied to this newly created variable can be applied to estimate Alberta's share of this variable.

The second step in creating the data requires estimating Alberta's share of the respective variable for years when PEA does not exist, but new national level data does (2010-2013). A detailed listing of the respective drivers used by variable is listed in the excel sheet provided, but a variety of indicators are used including: population, final consumption expenditures, public accounts data, personal income taxes paid by households, net operating surplus. In instances where no apparent variation in historical shares was present, it determined that would be more appropriate to hold Alberta's share of the national variable constant.

Once all variables are fully created over the estimation period, the relevant categories can be aggregated into total revenue and expenditure to determine net saving or borrowing. While these numbers should be broadly comparable to the old PEA estimates, they will not be directly equivalent due to historical revisions and changes by Statistics Canada to their reporting structure.

Source data for this analysis comes from tables: 380-0080, 380-0081, 384-0084, 384-0007, 384-0011.

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February 27, 2014

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39 This is the technique used by the Conference Board of Canada to estimate the Alberta data from the national public accounts.

Appendix B

Table B.1:   Calgary Local Government Transfer Dependency for Capital Spending and to Ensure Positive Net Financial Contribution from Residents

Year	Local Government Capital Spending	Local Government Intergovernmental Transfer Receipts	Net Financial Contribution from Calgarians to the Local Government (after Intergovernmental Transfers)	Net Financial Contribution from Calgarians to the Local Government (before Intergovernmental Transfers)
1991	265	768	178	-590
1992	282	758	164	-595
1993	279	742	90	-652
1994	239	876	111	-765
1995	261	963	166	-797
1996	253	937	137	-800
1997	273	1,005	230	-775
1998	312	1,001	208	-794
1999	342	1,143	249	-894
2000	403	1,173	263	-910
2001	457	1,305	304	-1,001
2002	598	1,272	90	-1,182
2003	419	1,236	-44	-1,280
2004	400	1,428	378	-1,050
2005	557	1,759	537	-1,222
2006	889	1,951	635	-1,315
2007	1,116	2,196	800	-1,396
2008	1,262	2,445	740	-1,705
2009	1,365	2,551	642	-1,910
2010	1,378	2,926	1,094	-1,832
2011	1,371	2,889	865	-2,024
2012	1,356	2,862	578	-2,284
2013	1,149	2,928	795	-2,133

Appendix C

Table C.1: The Net Financial Contribution of Calgarians to the Three Orders of Government

Year	Net Financial Contribution from Calgarians (after Intergovernmental Transfers)			Net Financial Contribution from Calgarians (before Intergovernmental Transfers)		
	Federal	Provincial	Local	Federal	Provincial	Local
1991	879	888	178	1,527	1,006	-590
1992	820	635	164	1,602	612	-595
1993	959	720	90	1,627	795	-652
1994	1,380	1,908	111	1,969	2,197	-765
1995	1,651	2,144	166	2,234	2,530	-797
1996	2,060	2,771	137	2,796	2,980	-800
1997	3,129	3,554	230	3,861	3,837	-775
1998	3,774	2,938	208	4,479	3,242	-794
1999	3,165	2,931	249	4,127	3,122	-894
2000	4,602	6,260	263	5,787	6,248	-910
2001	4,292	3,838	304	5,489	3,944	-1,001
2002	4,164	2,971	90	5,428	2,976	-1,182
2003	3,805	5,327	-44	5,796	4,569	-1,280
2004	5,592	5,657	378	6,796	5,878	-1,050
2005	7,201	7,838	537	8,380	8,414	-1,222
2006	9,866	7,684	635	10,873	8,622	-1,315
2007	10,931	5,779	800	11,933	6,966	-1,396
2008	11,395	6,390	740	12,650	7,570	-1,705
2009	9,444	1,328	642	10,718	2,594	-1,910
2010	9,276	2,925	1,094	10,768	4,347	-1,832
2011	10,760	4,079	865	12,256	5,463	-2,024
2012	11,345	2,174	578	12,765	3,606	-2,284
2013	11,539	2,702	795	13,024	4,136	-2,133

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The Calgary Experience

(An Update)

Appendix D:

Background Data, Economic and Demographic Indicators

This volume provides the empirical support for the results presented in volume one. Specifically, volume two presents the methodologies and data for the following: (a) estimating the expenditures incurred on and revenue received from Calgarians by the three orders of government; (b) estimating the responsiveness of Calgary local government revenue and expenditures to economic and demographic changes; (c) measuring the responsiveness of different revenue streams to changes in Calgary's economic and population growth; (d) measuring the responsiveness of property tax levies to demographic and economic changes in Calgary; (e) estimating the relative impact of demographic and economic changes in Calgary on income, goods and services and payroll taxes received by the provincial and federal orders of government; and (f) measuring the impact of Calgary and Alberta economic growth on property tax levies and total revenue for the local government and provincial government.

To enable the aforementioned analysis, Calgary local government data was constructed from Alberta provincial government estimates of expenditures incurred on and revenue received from Albertans by the three orders of government. The Alberta estimates were provided by the Conference Board of Canada. To generate the estimates for revenue and expenditures for the three levels of government in Calgary, allocators were developed. The allocators are used to determine the appropriate shares required to parse/map out the corresponding revenue and expenditure components for the three orders of government in Calgary. These allocators describe Calgary's share relative to Alberta for various economic and demographic indicators. The data covers the 23 year period from 1991 to 2013.

The allocators employed to map the expenditures incurred on and revenue received from Albertans by each of the three orders of government, to the expenditures incurred on and revenue received from Calgarians by the three orders of government in Calgary are presented in table 2.

Three of the allocators indicate the share of the metropolitan, economic region and provincial population living in Calgary. These are: Calgary's city population as a share of the Alberta population, Calgary's city population as a share of the population in the Calgary Census Metropolitan Area (CMA), and Calgary's city population as a share of the population in the Calgary Economic Region (ER). The population share allocators are used to adjust data reported for the CMA or ER, to reflect the equivalent for the city of Calgary. The other allocators are: number of employed, number of unemployed, total taxes, capital gains, emigrants, office space, population under the age of 15 years and population over the age of 64 years. The mapping of revenue collected from and the expenditures incurred on Calgarians by each order of government using the allocators are highlighted in figure D1 (Alberta Revenue) and figure D2 (Alberta Expenditure).

Table 1. Some Measures

Year	Population Growth	Inflation	Employment Growth	GDP Growth	Local Government Tax Share	Provincial Tax Share	Federal Tax Share	Debt per capita
1991	NA	NA	NA	NA	0.13	0.32	0.55	2,203
1992	0.01	0.01	-1.09	0.01	0.14	0.30	0.57	2,177
1993	0.01	0.01	0.72	0.06	0.14	0.31	0.56	2,038
1994	0.01	0.01	2.59	0.07	0.10	0.36	0.54	1,978
1995	0.01	0.02	4.97	0.02	0.09	0.37	0.54	1,830
1996	0.02	0.02	5.55	0.02	0.09	0.37	0.54	1,771
1997	0.03	0.02	4.05	0.08	0.08	0.37	0.56	1,673
1998	0.04	0.01	6.94	0.04	0.08	0.34	0.57	1,528
1999	0.03	0.03	3.16	0.01	0.08	0.35	0.57	1,410
2000	0.02	0.04	4.98	0.06	0.07	0.35	0.57	1,461
2001	0.02	0.02	4.02	0.02	0.08	0.32	0.60	1,420
2002	0.03	0.04	2.48	0.01	0.08	0.33	0.59	1,429
2003	0.02	0.04	2.54	0.03	0.08	0.32	0.60	1,544
2004	0.01	0.02	3.36	0.06	0.08	0.32	0.60	1,625
2005	0.02	0.02	2.19	0.05	0.08	0.32	0.61	1,613
2006	0.04	0.05	8.02	0.07	0.08	0.31	0.61	1,784
2007	0.03	0.05	3.79	0.02	0.08	0.31	0.61	2,063
2008	0.02	0.03	3.03	0.02	0.08	0.31	0.60	2,235
2009	0.02	0.00	-0.40	-0.04	0.09	0.31	0.60	2,734
2010	0.01	0.01	-1.29	0.04	0.10	0.31	0.59	3,225
2011	0.02	0.02	2.77	0.05	0.09	0.31	0.59	3,632
2012	0.03	0.01	3.89	0.04	0.09	0.32	0.59	3,792
2013	0.03	0.02	2.94	0.03	0.09	0.32	0.58	3,981

Table 2. Allocators

Year	CMA	ER	Pop	Pop < 15	Pop > 64	Number of Em-ployed	Number of Un-employed	Total Taxes	Capital Gains	Emi-grants	Office Space
1991	0.92	0.87	0.27	0.25	0.24	0.33	0.28	0.38	0.49	0.24	0.62
1992	0.92	0.87	0.27	0.25	0.24	0.33	0.29	0.37	0.49	0.24	0.62
1993	0.92	0.86	0.27	0.25	0.24	0.33	0.30	0.33	0.46	0.24	0.63
1994	0.91	0.87	0.27	0.26	0.25	0.33	0.29	0.38	0.50	0.24	0.63
1995	0.91	0.87	0.27	0.26	0.25	0.33	0.29	0.40	0.52	0.24	0.63
1996	0.91	0.86	0.28	0.26	0.25	0.34	0.29	0.40	0.47	0.24	0.64
1997	0.91	0.86	0.28	0.26	0.26	0.34	0.30	0.41	0.53	0.24	0.65
1998	0.91	0.85	0.28	0.27	0.26	0.35	0.27	0.45	0.57	0.24	0.67
1999	0.91	0.85	0.29	0.28	0.26	0.36	0.27	0.38	0.48	0.24	0.69
2000	0.90	0.85	0.29	0.29	0.26	0.36	0.28	0.42	0.51	0.24	0.70
2001	0.89	0.84	0.29	0.29	0.26	0.37	0.31	0.42	0.50	0.24	0.70
2002	0.90	0.85	0.29	0.30	0.26	0.37	0.32	0.41	0.44	0.24	0.70
2003	0.89	0.85	0.29	0.29	0.28	0.36	0.32	0.41	0.51	0.25	0.70
2004	0.88	0.84	0.29	0.30	0.27	0.37	0.31	0.41	0.54	0.24	0.70
2005	0.87	0.83	0.29	0.30	0.27	0.37	0.31	0.42	0.57	0.24	0.71
2006	0.88	0.84	0.29	0.28	0.26	0.38	0.29	0.42	0.51	0.24	0.71
2007	0.88	0.83	0.29	0.29	0.25	0.38	0.27	0.42	0.46	0.24	0.71
2008	0.87	0.82	0.29	0.29	0.25	0.37	0.29	0.41	0.48	0.24	0.71
2009	0.87	0.81	0.29	0.28	0.26	0.38	0.34	0.40	0.44	0.24	0.71
2010	0.86	0.82	0.29	0.28	0.25	0.37	0.33	0.41	0.52	0.24	0.72
2011	0.86	0.82	0.29	0.29	0.26	0.37	0.31	0.41	0.51	0.24	0.73
2012	0.86	0.82	0.29	0.29	0.25	0.38	0.32	0.41	0.51	0.24	0.73
2013	0.86	0.83	0.29	0.29	0.27	0.38	0.33	0.41	0.51	0.24	0.73

Figure D1.   Determining Alberta Provincial Government Revenue

Data for Alberta Local Governments (Conference Board of Canada)	Allocation Basis (Data on Tax/Revenue Base)	Derived Estimates for Alberta (Corporate Economics)
	Office Space	Corporate taxes
	Capital Gains	Investment Income
	Personal Taxes	Household Taxes
Total Local Government Revenue	Employment	Contributions to Social Assistance
		Taxes on Production and Imports
	Population	Government Transfers
	Emigration	Non-Residential Taxes

Figure D2.   Determining Alberta Provincial Government Expenditure

Data for Alberta Local Governments (Conference Board of Canada)	Allocation Basis (Data on Spending Beneficiaries)	Derived Estimates for Alberta (Corporate Economics)
	Direct Beneficiaries	Unemployment Insurance
	Total Population	Gross Current Expenditures on Goods and Services
		Interest on Debt
Total Local Government Expenditure		Subsidies
		Government Transfers
	Population above 64	Old Age Benefits
	Population below 15	Child Tax Credit and Benefits

Figures D1 and D2 summarize the methodology for estimating expenditures incurred on and revenue received from Calgarians by the three orders of government (federal, provincial, and local).

The allocators were determined by identifying the variables that most closely reflect (are strongly correlated with) the appropriate base for economic activities that generate revenue and the recipient base for public spending. A revenue example involved determining the contribution of Calgarians to social assistance revenue. Annual employment shares were used as allocators. This is because every employed person contributes to social assistance, and the data for this variable is available.

An expenditure example involved determining the part of public spending on Albertans for child tax credits and benefits that was for those Albertans living in Calgary. The number of individuals in Calgary under the age of 15 years as a share of the number of Albertans under the age of 15 years was used as an allocator. This is because beneficiaries for this category of public spending are children under the age of 15 years and data on this variable are readily available.

The definitions for the various measures used in work are presented below:

Total Spending in the city excluding Transfers = Current Expenditure + Capital Spending-Transfer Revenue

Capital Spending = Acquisition of Non-Financial Capital-Net Capital Transfers

Revenue collected from the city excluding Transfers = Total Revenue – Transfer Expenditures

Net Intergovernmental Transfers = Transfer Revenue - Transfer Spending

Saving = Total Revenue – Total Current Expenditure

Net Lending/Net Financial Contribution = Saving – Capital Spending + Capital Consumption Allowances

Net Lending/Net Financial Contribution excluding Transfer = Net Lending - Net Intergovernmental Transfers

Table 3. Tax share estimates for Calgary Local Government, Province of Alberta, and the Federal Government.

| Year | Share of Taxes | | |
	Calgary	Alberta	Federal
1991	0.11	0.33	0.57
1992	0.11	0.3	0.58
1993	0.11	0.31	0.58
1994	0.08	0.37	0.55
1995	0.07	0.37	0.56
1996	0.07	0.38	0.55
1997	0.06	0.37	0.57
1998	0.06	0.35	0.59
1999	0.06	0.35	0.59
2000	0.05	0.36	0.58
2001	0.06	0.33	0.61
2002	0.06	0.34	0.6
2003	0.07	0.31	0.62
2004	0.06	0.32	0.62
2005	0.06	0.32	0.62
2006	0.06	0.31	0.63
2007	0.06	0.31	0.63
2008	0.06	0.31	0.63
2009	0.07	0.31	0.62
2010	0.07	0.31	0.61
2011	0.07	0.31	0.62
2012	0.07	0.32	0.61
2013	0.07	0.33	0.6

The results show that the Calgary local government has seen its share of tax revenue decrease over the study period, despite strong GDP, population and employment growth.

Appendix E and F provide the estimation results from the models proposed and applied in this study.

Appendix E: Model Specifications and Results

E.1 Calgary's Local Government Fiscal Position in the Absence of Intergovernmental Transfers

A summary of the revenue from and expenditure incurred on Calgarians by the Calgary local government, with and without intergovernmental transfers, is provided in table 4. The estimates are reported in millions of current dollars.

Table 4.

Year	Current Expenditures with Transfers	Current Expenditures without Transfers	Total Expenditure	Revenue	Revenue without Transfers
1991	1,525	2,014	1,791	1,703	1,529
1992	1,590	2,130	1,871	1,754	1,686
1993	1,630	2,180	1,909	1,720	1,700
1994	1,609	2,151	1,848	1,720	1,581
1995	1,637	2,211	1,898	1,803	1,566
1996	1,666	2,257	1,919	1,804	1,609
1997	1,717	2,375	1,990	1,947	1,736
1998	1,831	2,565	2,144	2,039	1,830
1999	1,878	2,642	2,220	2,128	1,764
2000	2,060	2,957	2,463	2,322	1,981
2001	2,193	3,191	2,651	2,497	2,059
2002	2,330	3,435	2,929	2,420	2,007
2003	2,540	3,497	2,959	2,495	2,120
2004	2,569	3,551	2,969	2,947	2,428
2005	2,710	3,943	3,267	3,247	2,470
2006	2,955	4,589	3,844	3,590	2,703
2007	3,193	5,117	4,309	3,993	2,938
2008	3,592	5,693	4,854	4,332	3,089
2009	3,798	5,978	5,162	4,439	3,107
2010	3,951	6,246	5,328	5,045	3,370
2011	4,131	6,428	5,502	4,996	3,430
2012	4,489	6,760	5,845	5,067	3,647
2013	4,410	6,442	5,559	5,205	3,803

The average annual growth rate for current expenditures over the study period was 4.7 per cent. Total expenditures rose at 5.0 per cent, while total expenditures without intergovernmental transfers increased at 5.2 per cent. The average annual revenue growth rate over this period was 5.0 per cent, while total revenue without intergovernmental transfers was 4.0 per cent. Thus, with intergovernmental transfers, revenue growth was able to keep pace with expenditure growth. The percentage point difference in average annual growth rates of revenue and expenditures before and after intergovernmental transfers demonstrates the importance of intergovernmental transfers for revenue growth.

Table 5.

Year	Capital Spending	Revenue of Gov Transfers	Net Financial Contribution with Transfers	Net Financial Contribution without Transfers
1991	265	768	178	-590
1992	282	758	164	-595
1993	279	742	90	-652
1994	239	876	111	-765
1995	261	963	166	-797
1996	253	937	137	-800
1997	273	1,005	230	-775
1998	312	1,001	208	-794
1999	342	1,143	249	-894
2000	403	1,173	263	-910
2001	457	1,305	304	-1,001
2002	598	1,272	90	-1,182
2003	419	1,236	-44	-1,280
2004	400	1,428	378	-1,050
2005	557	1,759	537	-1,222
2006	889	1,951	635	-1,315
2007	1,116	2,196	800	-1,396
2008	1,262	2,445	740	-1,705
2009	1,365	2,551	642	-1,910
2010	1,378	2,926	1,094	-1,832
2011	1,371	2,889	865	-2,024
2012	1,356	2,862	578	-2,284
2013	1,149	2,928	795	-2,133

The estimates of capital spending, intergovernmental transfers, and net financial contributions with and without intergovernmental transfers are provided in table 5. The estimates indicate that the Calgary local government, without the assistance of intergovernmental transfers, continued to run an increasing net financial loss (increasing negative net financial contribution). The average annual capital spending for the Calgary local government grew at 6.6 per cent per year, while intergovernmental transfers grew at 6.0 per cent per year. The faster pace of capital spending growth relative to the growth of intergovernmental transfers is indicative of the implications of demographic and economic growth for municipal infrastructure requirements.

E.2   Revenue-Expenditure Systems Model

In this section, the responsiveness of municipal expenditures and revenue to changes in GDP, inflation, population and debt is estimated.

$$Expenditure_t = F(gdp_t, population_t, debt\ per\ capita_t, inflation_t, revenue_{t-1}), \qquad t = 1,\ldots, T \qquad (1)$$

Where:

Expenditure	=	*Calgary's expenditures*
Gdp	=	*Calgary gross domestic product*
population	=	*Calgary population*
debt per capita	=	*debt / population*
inflation	=	*rate change in the consumer price index*
revenue$_{t-1}$	=	*revenue from the previous period*

The expected correlation between the independent variables and expenditure is as follows:

Gdp > 0; population > 0; debt per capita > 0; inflation > 0; and revenue > 0

$$Revenue_t = G(gdp_t, debt\ per\ capita_t, expenditure_t), \qquad\qquad t = 1,\ldots, T \qquad (2)$$

Where:

Revenue	=	*Calgary's revenue*
gdp	=	*Calgary gross domestic product*
debt per capita	=	*debt / population*
Expenditure	=	*Calgary's expenditures*

The expected correlation between the independent variables and revenue is as follows:

Gdp > 0; debt per capita > 0; and Expenditure > 0.

The structural specification imposed was a log-log model, and the structural estimates were obtained using a Two Stage iterated Least Squares approach. The estimates, including for the instruments, are provided in the table below.

Table 6.   Two –Stage Least Squares Regression

Sample: 1992-2013, Included observations: 22

Total system (balanced) observations 44	Coefficient	Std. Error	t-Statistic	Prob.
Intercept	0.6925	3.9526	0.1752	0.8620
GDP	-0.4547	0.2938	-1.5475	0.1310
Population	0.3337	0.6906	0.4832	0.6321
Debt per Capita	0.0401	0.0551	0.7278	0.4717
Prior Year Revenue	0.3487	0.1934	1.8028	0.0803
Consumer Price Level	2.1693	0.5410	4.0096	0.0003
Intercept	-0.8979	1.6570	-0.5419	0.5914
GDP	0.3390	0.2196	1.5433	0.1320
Debt per Capita	0.1429	0.0487	2.9357	0.0059
Expenditure	0.4553	0.1353	3.3657	0.0019
Determinant residual covariance		1.09E-06		

Equation: LOG(CITY_MUN_TOTEXPWO) = C(1) + C(2)*LOG(CERGDP) + C(3)*LOG(CalgaryPOP) + C(4)*LOG(DEBT/CalgaryPOP) + C(5)*LOG(CITY_MUN_TOTREVWO(-1)) + C(7)*LOG(CPI)

Instruments: LOG(CERGDP), LOG(CalgaryPOP), LOG(DEBT/CalgaryPOP), LOG(CPI), LOG(CITY_MUN_TOTREVWO(-1))

Observations: 22

R-squared	0.994672		Mean dependent var	8.189861
Adjusted R-squared	0.993007		S.D. dependent var	0.421013
S.E. of regression	0.035207		Sum squared resid	0.019833
Durbin-Watson stat	1.585564			

Equation: LOG(CITY_MUN_TOTREVWO) = C(11) + C(12)*LOG(CERGDP) + C(14)*LOG(DEBT/CalgaryPOP) + C(15)*LOG(CITY_MUN_TOTEXPWO)

Instruments: LOG(CITY_MUN_TOTEXPWO(-1)), LOG(CERGDP), LOG(CalgaryPOP), LOG(DEBT/CalgaryPOP), LOG(CPI) LOG(CITY_MUN_TOT)

REVWO(-1)) C

Observations: 22

R-squared	0.985871		Mean dependent var	7.735668
Adjusted R-squared	0.983516		S.D. dependent var	0.301424
S.E. of regression	0.0387		Sum squared resid	0.026959
Durbin-Watson stat	1.34569			

The results are presented in table 6. The results indicate that a unit change in GDP has no statistically significant association with changes in revenue or expenditures. Consumer prices, debt per capita and expenditures are all statistically significant at the 1 per cent level, while prior year revenue is statistically significant at the 10 per cent level.

An in-sample forecast for the sample period 2005 to 2013, provides forecast values of total expenditures and revenue without intergovernmental transfers in figure E1. The good fit between the forecast estimates and actual observations provides strong evidence in support of the integrity of the above structural system of equations and its ability to appropriately reflect actual observations. The model can therefore be applied to what-if analysis, and can provide valuable insights on expenditure-revenue dynamics as it relates to different scenarios for economic growth, debt accumulation, inflation or population growth.

Figure E1.   Expenditure and revenuse in Sample Forecast Without Transfer 2005-2013

Billions of dollars
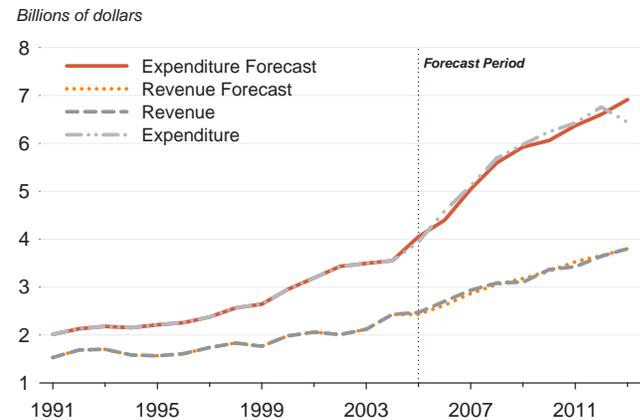
E.3   Property Tax Levy Model

A major revenue generation component for municipalities is the property tax levy. To analyze the implications of changes in the level of economic activity on the property tax levy, a single equation model of property tax levy as a function of GDP per capita, debt per capita and inflation was adopted. Table 7 provides the results for the single equation log-log model.

Property tax levy$_t$ = F(gdp per capita$_t$, dwebt per capita$_t$, inflation$_t$)   *t = 1,…, T*   *(3)*

Where:

$$gdp\ per\ capita_t\ =\ Calgary\ GDP\ per\ population$$

$$debt\ per\ capita_t\ =\ municipal\ debt\ in\ Calgary\ population$$

$$inflation\ =\ per\ cent\ change\ in\ the\ consumer\ price\ index$$

The expected correlation between the independent variables and property tax levy are as follows:

$$gdp\ per\ capita_t\ > 0;\ debt\ per\ capita_t\ ,\ > 0;\ and\ inflation > 0.$$

Table 7.

Dependent Variable: LOG(PROPTAX)   **Method:** Least Squares
Sample: 1991 2013   **Included observations:** 23

LOG(PROPTAX) = C(1) + C(2) * LOG(CERGDP) + C(3)* LOG(CalgaryPOP) + C(4) * LOG(DEBT/CITYPOP)
          + C(5) * LOG(CPI)

	Coefficient	Std. Error	t-Statistic	Prob.
Intercept	-1.989008	3.190155	-0.623483	0.5408
GDP	0.068207	0.233504	0.292104	0.7735
Population	1.076072	0.556749	1.932777	0.0692
Debt per Capita	0.258305	0.028527	9.054875	0
Consumer Price Level	1.273403	0.432704	2.942896	0.0087
R-squared	0.996649	Mean dependent var		6.284477
Adjusted R-squared	0.995904	S.D. dependent var		0.456177
S.E. of regression	0.029195	Akaike info criterion		-4.039992
Sum squared resid	0.015342	Schwarz criterion		-3.793145
Log likelihood	51.45991	Hannan-Quinn criter.		-3.977911
F-statistic	1338.323	Durbin-Watson stat		1.072107
Prob(F-statistic)	0			

The statistical relationship between GDP per capita and the property tax levy reveals that property taxes increase by 0.067 per cent for every one per cent increase in GDP per capita, but the estimate is not statistically significant at the 5 or 10 per cent confidence levels. The very low value of the coefficient (less than 1 per cent) also implies that property tax levies are relatively inelastic to changes in GDP per capita. The model does indicate statistical significant relationships for all other explanatory variables. Property taxes respond positively and more than proportionately to inflation and population growth. Property taxes also respond positively, but less than proportionately, to changes in the level of debt per capita. This provides further evidence of the inelastic response of property taxes to changes in the level of economic activity in Calgary. The fact that property taxes are a tax on capital stock (a stock) and not income (a flow), leads to a situation whereby the property tax levy does not fully reflect (fully capture) the impact of economic activity. This is because economic activity is captured on the additional stock gained, and not necessarily on the increase on existing stock value. Therefore, the responsiveness of property taxes to GDP growth will not readily translate to a net positive increase in financial position for Calgary. In contrast, the impact of some selected taxes such as sales, income or payroll taxes, should capture the impact of economic growth much more appropriately. The next model considers the responsiveness of these three taxes to changes in the level of economic activity in Calgary and Alberta.

E.4 Relative Impact Model

Single log-log linear equation models are used to estimate the responsiveness of income, sales and payroll taxes to the level of economic and demographic activity in Alberta and then Calgary. Estimates were determined for taxes collected by the consolidated government (federal, provincial and local), the federal government, and all Canadian provincial governments. The objective is to assess the extent to which these taxes are more responsive to economic and demographic changes in Calgary than they are to economic and demographic changes in Alberta[1]

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1. The ratio of the single equation models coefficients for Alberta and Calgary are used to define the relative impact coefficients. The ratio of the Calgary estimated coefficient divided by Alberta estimated coefficient approximates the relative impact coefficient, which, when greater than one implies Calgary has a stronger impact than Alberta, and vice versa.

$$IncomeTax_t = F(J\ GDP_t\ ,\ J\ Population_t)$$
$$J = Calgary,\ Alberta \qquad t = 1,\ldots,\ T \qquad (4)$$

$$GST_t = F(J\ GDP_t\ ,\ J\ Population_t)$$
$$J = Calgary,\ Alberta \qquad t = 1,\ldots,\ T \qquad (5)$$

$$Payroll_t = F(J\ GDP_t\ ,\ J\ Population_t)$$
$$J = Calgary,\ Alberta \qquad t = 1,\ldots,\ T \qquad (6)$$

The expected correlation between each of the three taxes and the gross domestic product or population for Calgary and Alberta are positive. Thus, Calgary GDP and Calgary population are positively correlated with income, sales and payroll taxes. Similarly, Alberta GDP and Alberta population are positively correlated with income, sales and payroll taxes.

The first three single equation results presented in tables 8, 9 and 10 measure the responsiveness of income, sales and payroll taxes for Canada's consolidated government to changes in Alberta's population and GDP. The ability to explain the variation in these three taxes was tracked with a good degree of precision by economic and demographic changes in Alberta and Calgary.

Table 8.

Dependent Variable: LOG(INCTAXCAN) **Method:** Least Squares
Sample: 1991Q1 2013Q4 **Included observations:** 92

LOG(INCTAXCAN) = C(21) + C(22) * LOG(ALBGDP1) + C(24) * LOG(ALBPOP)

	Coefficient	Std. Error	t-Statistic	Prob.
Intercept	-3.906083	0.550671	-7.093309	0
Alberta GDP	1.338301	0.153096	8.741552	0
Alberta Population	-0.20993	0.275358	-0.76239	0.4478
R-squared	0.943258	Mean dependent var		10.73779
Adjusted R-squared	0.941983	S.D. dependent var		0.301171
S.E. of regression	0.072542	Akaike info criterion		-2.377227
Sum squared resid	0.468353	Schwarz criterion		-2.294995
Log likelihood	112.3525	Hannan-Quinn criter.		-2.344038
F-statistic	739.7509	Durbin-Watson stat		1.617451
Prob(F-statistic)	0			

Table 9.

Dependent Variable: LOG(GSTAXCAN) **Method:** Least Squares
Sample: 1991Q1 2013Q4 **Included observations:** 92

LOG(GSTAXCAN) = C(21) + C(22) * LOG(ALBGDP1) + C(24) * LOG(ALBPOP)

	Coefficient	Std. Error	t-Statistic	Prob.
Intercept	-3.382648	0.462299	-7.317008	0
Alberta GDP	0.831728	0.128527	6.471211	0
Alberta Population	0.404163	0.231168	1.748349	0.0839
R-squared	0.945745	Mean dependent var		10.02462
Adjusted R-squared	0.944526	S.D. dependent var		0.258569
S.E. of regression	0.060901	Akaike info criterion		-2.727079
Sum squared resid	0.330092	Schwarz criterion		-2.644847
Log likelihood	128.4456	Hannan-Quinn criter.		-2.693889
F-statistic	775.7026	Durbin-Watson stat		1.704272
Prob(F-statistic)	0			

Table 10.

Dependent Variable: LOG(ROLLTAXCAN) **Method:** Least Squares
Sample: 1991Q1 2013Q4 **Included observations:** 92

LOG(ROLLTAXCAN) = C(21) + C(22) * LOG(ALBGDP1) + C(24) * LOG(ALBPOP)

	Coefficient	Std. Error	t-Statistic	Prob.
Intercept	-6.435362	0.339591	-18.95035	0
Alberta GDP	0.454732	0.094412	4.816455	0
Alberta Population	1.056518	0.169809	6.221806	0
R-squared	0.969067	Mean dependent var		7.625073
Adjusted R-squared	0.968372	S.D. dependent var		0.251548
S.E. of regression	0.044736	Akaike info criterion		-3.344023
Sum squared resid	0.178115	Schwarz criterion		-3.26179
Log likelihood	156.825	Hannan-Quinn criter.		-3.310833
F-statistic	1394.107	Durbin-Watson stat		2.597003
Prob(F-statistic)	0			

The regression results presented in tables 11 and 12 determine the responsiveness of federal income taxes and federal sales taxes to changes in Alberta's GDP and population.

Table 11.

Dependent Variable: LOG(INCTAXFED) **Method:** Least Squares
Sample: 1991Q1 2013Q4 **Included observations:** 92

LOG(INCTAXFED) = C(21) + C(22) * LOG(ALBGDP1) + C(24) * LOG(ALBPOP)

	Coefficient	Std. Error	t-Statistic	Prob.
Intercept	-4.098617	0.619693	-6.613945	0
Alberta GDP	1.577379	0.172286	9.155598	0
Alberta Population	-0.606162	0.309871	-1.956173	0.0536
R-squared	0.931858	Mean dependent var		10.27176
Adjusted R-squared	0.930327	S.D. dependent var		0.309273
S.E. of regression	0.081635	Akaike info criterion		-2.141055
Sum squared resid	0.593119	Schwarz criterion		-2.058823
Log likelihood	101.4885	Hannan-Quinn criter.		-2.107865
F-statistic	608.5469	Durbin-Watson stat		1.599439
Prob(F-statistic)	0			

Table 12.

Dependent Variable: LOG(GSTAXFED) **Method:** Least Squares
Sample: 1991Q1 2013Q4 **Included observations:** 92

LOG(GSTAXFED) = C(21) + C(22) * LOG(ALBGDP1) + C(24) * LOG(ALBPOP)

	Coefficient	Std. Error	t-Statistic	Prob.
Intercept	0.963983	0.589644	1.634855	0.1056
Alberta GDP	1.241661	0.163931	7.574271	0
Alberta Population	-0.869445	0.294846	-2.948815	0.0041
R-squared	0.853255	Mean dependent var		9.116
Adjusted R-squared	0.849957	S.D. dependent var		0.200531
S.E. of regression	0.077676	Akaike info criterion		-2.240466
Sum squared resid	0.536992	Schwarz criterion		-2.158234
Log likelihood	106.0615	Hannan-Quinn criter.		-2.207277
F-statistic	258.7468	Durbin-Watson stat		1.417541
Prob(F-statistic)	0			

In general, the results on the responsiveness of all income, sales and payroll taxes collected in Canada by the consolidated Canadian government to changes in Alberta's GDP or population have the *a priori* sign expectations. The estimates are also statistically significant. The only exception was the estimate of the responsiveness of Canadian income taxes to changes in Alberta's population, which has a coefficient that is not statistically significant.

The results when only taxes collected by the federal government are considered, indicate that positive changes in Alberta's population are associated with negative changes in both federal income tax and sales tax collections. These estimates are statistically significant. On the other hand, the coefficients from the regression of federal income, sales or payroll taxes on Alberta GDP are elastic, positive and statistically significant. Together, a 1 per cent increase in both population and GDP generates a positive net balance on sales and income taxes.

The next set of regression results, presented in Tables 13, 14 and 15, provide estimates of the level of responsiveness of income, sales and payroll taxes collected by all Canadian provincial governments to changes in Alberta's GDP and population.

Table 13.

Dependent Variable: LOG(INCTAXPROV)   **Method:** Least Squares
Sample: 1991Q1 2013Q4   **Included observations:** 92

LOG(INCTAXPROV) = C(21) + C(22) * LOG(ALBGDP1) + C(24) * LOG(ALBPOP)

	Coefficient	Std. Error	t-Statistic	Prob.
Intercept	-5.4209	0.637485	-8.503576	0
Alberta GDP	0.937885	0.177232	5.291848	0
Alberta Population	0.462007	0.318768	1.449352	0.1508
R-squared	0.92141	Mean dependent var	9.748018
Adjusted R-squared	0.919644	S.D. dependent var	0.296251
S.E. of regression	0.083979	Akaike info criterion	-2.084443
Sum squared resid	0.627665	Schwarz criterion	-2.002211
Log likelihood	98.8844	Hannan-Quinn criter.	-2.051254
F-statistic	521.7321	Durbin-Watson stat	1.364413
Prob(F-statistic)	0		

Table 14.

Dependent Variable: LOG(GSTAXPROV) **Method:** Least Squares
Sample: 1991Q1 2013Q4 **Included observations:** 92

LOG(GSTAXPROV) = C(21) + C(22) * LOG(ALBGDP1) + C(24) * LOG(ALBPOP)

	Coefficient	Std. Error	t-Statistic	Prob.
Intercept	-7.096495	0.472241	-15.02726	0
Alberta GDP	0.614901	0.131292	4.683476	0
Alberta Population	1.127537	0.23614	4.774875	0
R-squared	0.95833		Mean dependent var	9.490952
Adjusted R-squared	0.957393		S.D. dependent var	0.301387
S.E. of regression	0.06221		Akaike info criterion	-2.684523
Sum squared resid	0.344442		Schwarz criterion	-2.602291
Log likelihood	126.4881		Hannan-Quinn criter.	-2.651334
F-statistic	1023.407		Durbin-Watson stat	1.861069
Prob(F-statistic)	0			

Table 15.

Dependent Variable: LOG(ROLLTAXPROV) **Method:** Least Squares
Sample: 1991Q1 2013Q4 **Included observations:** 92

LOG(ROLLTAXPROV) = C(21) + C(22) * LOG(ALBGDP1) + C(24) * LOG(ALBPOP)

	Coefficient	Std. Error	t-Statistic	Prob.
Intercept	-6.435362	0.339591	-18.95035	0
Alberta GDP	0.454732	0.094412	4.816455	0
Alberta Population	1.056518	0.169809	6.221806	0
R-squared	0.969067		Mean dependent var	7.625073
Adjusted R-squared	0.968372		S.D. dependent var	0.251548
S.E. of regression	0.044736		Akaike info criterion	-3.344023
Sum squared resid	0.178115		Schwarz criterion	-3.26179
Log likelihood	156.825		Hannan-Quinn criter.	-3.310833
F-statistic	1394.107		Durbin-Watson stat	2.597003
Prob(F-statistic)	0			

The results provide the *a priori* expectations on GDP and population coefficients, which are positive. Another consideration in this analysis was the estimates of the adjusted R square obtained from these regressions. Population and economic growth are typically accompanied by growth in wages and salaries and household consumption expenditures, which in turn lead to growth in the tax base. The adjusted R-square from the Canadian provincial income tax, Canadian provincial sales tax, and Canadian provincial payroll tax regressions were 92 per cent, 96 per cent and 97 per cent, respectively. This indicates that the variations observed in these three taxes are very well explained by the variation in demographic and economic activity in Alberta. The adjusted R square for the federal government and the consolidated Canadian government tax regressions also indicate similar strong reliance on the level of economic and demographic activity in Alberta. This demonstrates the importance of economic and demographic activity in Alberta on the finances of the provincial and federal governments.

A similar exercise is carried out for Calgary and presented in the next set of regression results. Relative impact coefficients are used to determine the extent to which these taxes are more responsive to the pace of change in economic and demographic activity in Calgary, than they are to the pace of change in economic and demographic activity in Alberta. This analysis was conducted for income, sales and payroll taxes collected by Canadian provincial governments, the federal government, and the consolidated Canadian government.

Eight single equation regressions were used to determine the responsiveness of all income, payroll and sales taxes collected in Canada by all provincial governments, the federal government and the consolidated government to changes in Calgary's economic and population growth. The results are presented in tables 16, 17 18, 19, 20, 21, 22, and 23. These eight regressions are used to generate coefficients that can be compared with the coefficients generated in the preceding eight regressions that provided estimates of the responsiveness of these taxes to changes in demographic and economic activity in Alberta.

Table 16.

Dependent Variable: LOG(INCTAXCAN)   **Method:** Least Squares
Sample: 1991Q1 2013Q4   **Included observations:** 92

LOG(INCTAXCAN) = C(21) + C(22) * LOG(CERGDP1) + C(24) * LOG(CalgaryPOP)

	Coefficient	Std. Error	t-Statistic	Prob.
Intercept	-3.557371	0.445596	-7.983396	0
GDP	1.424969	0.246971	5.769775	0
Population	-0.253786	0.369825	-0.686233	0.4943
R-squared	0.939864	Mean dependent var	10.73779
Adjusted R-squared	0.938512	S.D. dependent var	0.301171
S.E. of regression	0.074681	Akaike info criterion	-2.319127
Sum squared resid	0.49637	Schwarz criterion	-2.236895
Log likelihood	109.6798	Hannan-Quinn criter.	-2.285937
F-statistic	695.4841	Durbin-Watson stat	1.531702
Prob(F-statistic)	0		

Table 17.

Dependent Variable: LOG(GSTAXCAN)   **Method:** Least Squares
Sample: 1991Q1 2013Q4   **Included observations:** 92

LOG(GSTAXCAN) = C(21) + C(22) * LOG(CERGDP1) + C(24) * LOG(CalgaryPOP)

	Coefficient	Std. Error	t-Statistic	Prob.
Intercept	-1.655355	0.37877	-4.37034	0
GDP	0.614677	0.209933	2.927968	0.0043
Population	0.700702	0.314362	2.228965	0.0283
R-squared	0.941051	Mean dependent var		10.02462
Adjusted R-squared	0.939726	S.D. dependent var		0.258569
S.E. of regression	0.063481	Akaike info criterion		-2.644093
Sum squared resid	0.358653	Schwarz criterion		-2.561861
Log likelihood	124.6283	Hannan-Quinn criter.		-2.610903
F-statistic	710.385	Durbin-Watson stat		1.61492
Prob(F-statistic)	0			

Table 18.

Dependent Variable: LOG(ROLLTAXCAN)   **Method:** Least Squares
Sample: 1991Q1 2013Q4   **Included observations:** 92

LOG(ROLLTAXCAN) = C(21) + C(22) * LOG(CalgaryGDP1) + C(24) * LOG(CalgaryPOP)

	Coefficient	Std. Error	t-Statistic	Prob.
Intercept	-3.596557	0.268343	-13.40281	0
GDP	0.31865	0.148729	2.142487	0.0349
Population	1.12245	0.222713	5.039895	0
R-squared	0.968738	Mean dependent var		7.625073
Adjusted R-squared	0.968035	S.D. dependent var		0.251548
S.E. of regression	0.044974	Akaike info criterion		-3.333417
Sum squared resid	0.180014	Schwarz criterion		-3.251185
Log likelihood	156.3372	Hannan-Quinn criter.		-3.300228
F-statistic	1378.931	Durbin-Watson stat		2.46386
Prob(F-statistic)	0			

Table 19.

Dependent Variable: LOG(INCTAXFED) **Method:** Least Squares
Sample: 1991Q1 2013Q4 **Included observations:** 92

LOG(INCTAXFED) = C(21) + C(22) * LOG(CalgaryGDP1) + C(24) * LOG(CalgaryPOP)

	Coefficient	Std. Error	t-Statistic	Prob.
Intercept	-4.257703	0.523802	-8.128456	0
GDP	1.444651	0.290317	4.976119	0
Population	-0.251877	0.434732	-0.579385	0.5638
R-squared	0.921199	Mean dependent var		10.27176
Adjusted R-squared	0.919428	S.D. dependent var		0.309273
S.E. of regression	0.087788	Akaike info criterion		-1.995725
Sum squared resid	0.685895	Schwarz criterion		-1.913493
Log likelihood	94.80335	Hannan-Quinn criter.		-1.962535
F-statistic	520.2137	Durbin-Watson stat		1.349615
Prob(F-statistic)	0			

Table 20.

Dependent Variable: LOG(GSTAXFED) **Method:** Least Squares
Sample: 1991Q1 2013Q4 **Included observations:** 92

LOG(GSTAXFED) = C(21) + C(22) * LOG(CalgaryGDP1) + C(24) * LOG(CalgaryPOP)

	Coefficient	Std. Error	t-Statistic	Prob.
Intercept	0.106208	0.510683	0.207973	0.8357
GDP	1.00651	0.283045	3.556004	0.0006
Population	-0.339048	0.423843	-0.799937	0.4259
R-squared	0.821836	Mean dependent var		9.116
Adjusted R-squared	0.817832	S.D. dependent var		0.200531
S.E. of regression	0.085589	Akaike info criterion		-2.046457
Sum squared resid	0.651966	Schwarz criterion		-1.964225
Log likelihood	97.13701	Hannan-Quinn criter.		-2.013267
F-statistic	205.2692	Durbin-Watson stat		1.106355
Prob(F-statistic)	0			

Table 21.

Dependent Variable: LOG(INCTAXPROV) **Method:** Least Squares
Sample: 1991Q1 2013Q4 **Included observations:** 92

LOG(INCTAXPROV) = C(21) + C(22) * LOG(CalgaryGDP1) + C(24) * LOG(CalgaryPOP)

	Coefficient	Std. Error	t-Statistic	Prob.
Intercept	-4.205032	0.48931	-8.593796	0
GDP	1.393409	0.2712	5.137946	0
Population	-0.251914	0.406105	-0.620318	0.5366
R-squared	0.925057		Mean dependent var	9.748018
Adjusted R-squared	0.923373		S.D. dependent var	0.296251
S.E. of regression	0.082007		Akaike info criterion	-2.13196
Sum squared resid	0.598538		Schwarz criterion	-2.049728
Log likelihood	101.0702		Hannan-Quinn criter.	-2.09877
F-statistic	549.2868		Durbin-Watson stat	1.490947
Prob(F-statistic)	0			

Table 22.

Dependent Variable: LOG(GSTAXPROV) **Method:** Least Squares
Sample: 1991Q1 2013Q4 **Included observations:** 92

LOG(GSTAXPROV) = C(21) + C(22) * LOG(CalgaryGDP1) + C(24) * LOG(CalgaryPOP)

	Coefficient	Std. Error	t-Statistic	Prob.
Intercept	-3.899173	0.386888	-10.0783	0
GDP	0.418232	0.214432	1.950417	0.0543
Population	1.276562	0.3211	3.975595	0.0001
R-squared	0.954731		Mean dependent var	9.490952
Adjusted R-squared	0.953713		S.D. dependent var	0.301387
S.E. of regression	0.064841		Akaike info criterion	-2.601682
Sum squared resid	0.374191		Schwarz criterion	-2.51945
Log likelihood	122.6774		Hannan-Quinn criter.	-2.568493
F-statistic	938.5054		Durbin-Watson stat	1.862226
Prob(F-statistic)	0			

All the coefficient estimates for GDP and population variables have the *a priori* sign expectations (positive). Also, they are mostly statistically significant. The exception is the Calgary population, which is not statistically signficant in the federal income tax and federal sales tax regressions.

The relative impact response coefficients indicate that a unit increase in Calgary's GDP or population results in a greater increase in payroll, sales and income taxes than a unit increase in Alberta's population or GDP. This is true for tax collections by all Canadian provincial governments, the federal government, and the consolidated Canadian government. This reflects Calgary's important role in the finances of Canadian governments.

E.5 Revenue-Property Tax Levy Systems Model (Consolidated Provincial Government)

The analysis in this section assesses the extent to which changes in the level of economic activity in Calgary and Alberta are transmitted to local government and provincial government property taxes and other revenue. The modeling in this case is done using a simultaneous systems approach.

The results demonstrate that Canadian local government revenue and property tax collections are unresponsive to changes in Calgary's GDP, while Canadian provincial government revenue and property tax collections are responsive to changes in Alberta's GDP. It is important to note that there is a slight difference between the local government and provincial government revenue models. This is because of the condition imposed by the Alberta provincial government on municipal governments to maintain balanced operating budgets. Thus, local government expenditures are included as an independent variable in the local government revenue model. The ability of the model to provide an in-sample forecast that had a close fit with actual observations for both local government and provincial government property tax and total revenue collection was also examined.

The system of simultaneous equations described by equations 7 and 8 assesses the extent to which changes in the level of economic activity in Calgary is transmitted to Canadian provincial property taxes and total revenue.

$Revenue_t = G(Albgdp_t, \text{debt per capita}_t, \text{Property Tax Levy}_t),$ $\qquad t = 1,…, T \qquad (7)$

Where

Alberta gross domestic product	=	*Albgdp*
Provincial Debt Per Capita	=	*debt per capita*
Provincial Property Tax Levy	=	*Property Tax Levy*

And the expected correlation coefficient signs with total provincial revenue are,

Albgdp > 0, debt per capita > 0, and Property Tax Levy > 0.

$\text{Property Tax Levy}_t = F(Albgdp_t, Albpop_t),$ $\qquad t = 1,…, T \qquad (8)$

Where

Alberta gross domestic product	=	*Albgdp*
Alberta Population	=	*Albpop*

And the expected correlation coefficient signs with total provincial property tax levy are,

Albgdp > 0, and Albpop > 0.

Table 23.

System: FISCAL2PROV   Estimation Method: Two-Stage Least Squares

Date: 10/27/14   Time: 11:23   Sample: 1991Q2 2013Q4

Included observations: 91   Total system (balanced) observations 182

	Coefficient	Std. Error	t-Statistic	Prob.
Intercept	-3.35	0.90	-3.74	0.00
Alberta GDP	1.42	0.06	23.92	0.00
All Provincial Debt per Albertan	-0.13	0.08	-1.53	0.13
All Provincial Property Tax	-0.27	0.06	-4.09	0.00
Intercept	4.07	0.54	7.48	0.00
Alberta GDP	2.66	0.15	17.39	0.00
Alberta Population	-3.60	0.27	-13.17	0.00
Determinant residual covariance	7.37E-06			

Equation: LOG(REVPROV) = C(11)+C(12)*LOG(ALBGDP1)+C(14) *LOG(1000*INTRPROV/ALBPOP) + C(15)*LOG(PROPTAXPROV)

Instruments: LOG(PROPTAXPROV(-1)) LOG(ALBGDP1) LOG(ALBPOP/1000) LOG(1000*INTRPROV/ALBPOP) C

Observations: 91

R-squared	0.98	Mean dependent var	11.03
Adjusted R-squared	0.98	S.D. dependent var	0.30
S.E. of regression	0.05	Sum squared resid	0.18
Durbin-Watson stat	1.21		

Equation: LOG(PROPTAXPROV) = C(1)+C(2)*LOG(ALBGDP1)+C(4)*LOG(ALBPOP)

Instruments: LOG(ALBGDP1) LOG(ALBPOP(-1)) C

Observations: 91

R-squared	0.88	Mean dependent var	7.50
Adjusted R-squared	0.88	S.D. dependent var	0.20
S.E. of regression	0.07	Sum squared resid	0.45
Durbin-Watson stat	1.12		

The in-sample forecast estimates generated from the system of equations can be compared with actual revenue and property tax collections. The in-sample forecast (between 2005 and 2013) for the dependent variables (property tax levy and revenue) are provided in Figure E2.

The forecast tracks the property tax levy better than it tracks total revenue. This was expected because provincial property taxes are relatively more insensitive to economic expansion than provincial total revenue. This is because provincial total revenue has growth sensitive components. Thus, the total revenue forecast for all Canadian provincial governments responds better to economic and demographic activity in Alberta, than the property tax levy forecast for all Canadian provincial governments.

Figure E2. Consolidated Provincial Property Tax Levy and Total Revenue Forecast
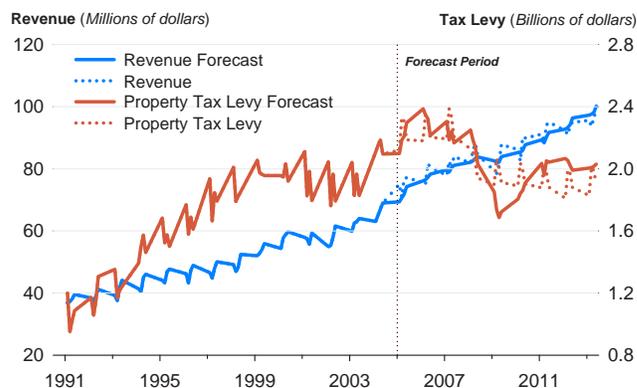
E.6 Revenue-Property Tax Levy Systems Model (Consolidated Local Government)

$Revenue_t = G(Calgarygdp_t, debt\ per\ capita_t, Property\ Tax\ Levy_t),$ $\qquad t = 1,…, T \qquad (9)$

Where

Calgary gross domestic product	=	*Calgarygdp*
Local Government Debt Per Capita	=	*debt per capita*
Local Government Property Tax Levy	=	*Property Tax Levy.*

And the expected correlation coefficient signs with total Local government revenue are,

Citygdp > 0, debt per capita > 0, and Property Tax Levy > 0.

$Property\ Tax\ Levy_t = F(Calgarygdp_t, Calgarypop_t, ExpenditureLoc_t),$ $\qquad t = 1,…, T \qquad (10)$

Where

Calgary gross domestic product	=	*Calgarygdp*
Calgary Population	=	*Calgarypop*
Local Government Expenditures	=	*ExpenditureLoc*

And the expected correlation coefficient signs with total Local government property tax levy are,

Calgarygdp > 0, Calgarypop > 0 and ExpenditureLoc > 0.

The analysis in this section examines the responsiveness of consolidated local government property tax levy and revenue to changes in Calgary's GDP. The expectation is that the consolidated local government property tax levy would be more responsive to changes in Calgary's GDP than the extent to which the consolidated provincial government revenue is responsive to changes in Calgary's GDP. Also, the consolidated local government property tax levy is expected to be relatively inelastic to economic growth.

The resulting coefficients for the system of equations are provided in table 24. There is also an in-sample forecast that examines the extent to which historical data on consolidated local government property tax levy and total revenue and their correlation with historical data on economic activity can be used to predict future taxes and revenue (figures C3.1, C3.2 and C3.3).

The in-sample forecast of the above system of equations indicates that the path of property tax growth is more consistent with past trends in the correlation between property tax and Calgary economic activity, than the path of total revenue growth which is less consistent with past trends in the correlation between total revenue and Calgary economic activity. Consolidated local government total revenue and property taxes have a positive correlation. The coefficients on Calgary's population and economic output are not statistically significant. There was a tighter fit between actual estimates and in-sample forecast estimates of local government revenue than was the case with the provincial government actual and in-sample forecast estimates. Figure E3.1 provides in-sample forecasts for both total revenue and property tax levy for all local governments. Figures E3.2 and E3.3 provide separate in-sample forecasts of property tax levy and total revenue, respectively.

The graphs have been separated to enable a better comparison of each series. The in-sample forecasts also provide strong evidence of the structural integrity of the simultaneous system specification.

Figure E3.1.   Consolidated Municipal Property Tax Levy and Total Revenue Forecast
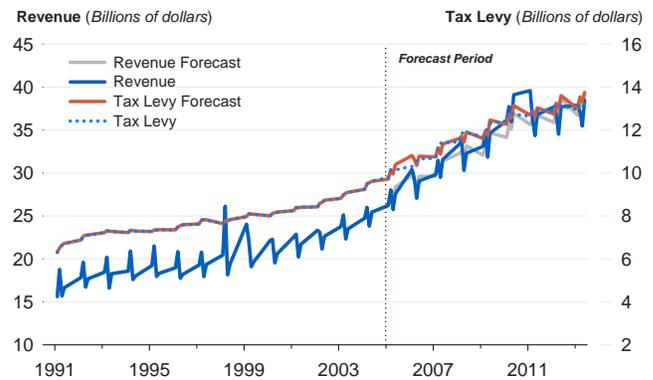
Figure E3.2.   Consolidated Municipal Property Tax Levy Forecast
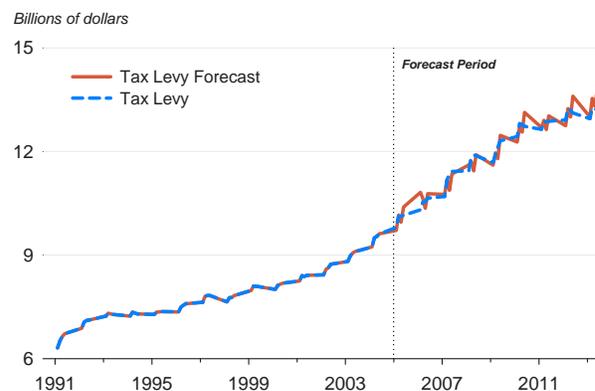
Figure E3.3.   Consolidated Municipal Revenue Forecast
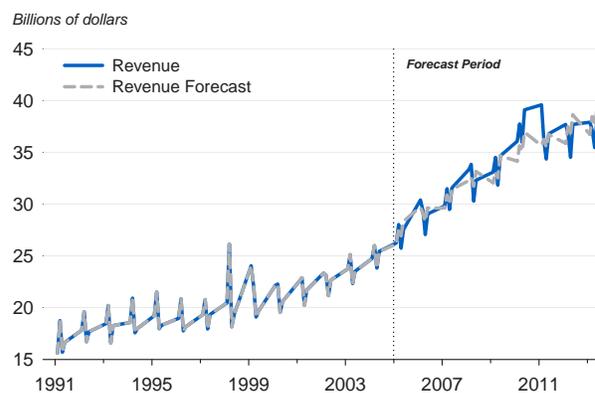
Table 24.

System: FISCAL2LOC	Estimation Method: Two-Stage Least Squares			
Date: 05/30/14 Time: 13:50	Sample: 1991Q2 2013Q4			
Included observations: 91	Total system (balanced) observations 182			

	Coefficient	Std. Error	t-Statistic	Prob.
Intercept	-1.46	1.63	-0.89	0.37
GDP	0.11	0.17	0.67	0.50
All Local Government Debt per Calgarian	0.04	0.08	0.49	0.63
All Local Government Property Taxes	1.10	0.12	8.85	0.00
Intercept	0.68	0.15	4.50	0.00
GDP	0.21	0.09	2.40	0.02
All Local Government Expenditures	0.78	0.05	15.65	0.00
Population	-0.27	0.19	-1.44	0.15
Determinant residual covariance	1.53E-06			

Equation: LOG(REVLOC) = C(11) + C(12) * LOG(CalgaryGDP1) + C(14)*LOG(1000 * INTRLOC / CalgaryPOP) + C(15) * LOG(PROPTAXLOC)

Instruments: LOG(PROPTAXLOC(-1)) LOG(CalgaryGDP1) LOG(CalgaryPOP/1000) LOG(1000*INTRLOC/CalgaryPOP) C

Observations: 91

R-squared	0.94	Mean dependent var	10.11
Adjusted R-squared	0.94	S.D. dependent var	0.27
S.E. of regression	0.07	Sum squared resid	0.39
Durbin-Watson stat	2.09		

Equation: LOG(PROPTAXLOC) = C(1) + C(2) * LOG(CalgaryGDP1)+ C(3) * LOG(TOTEXPLOC) + C(4) * LOG(CalgaryPOP)

Instruments: LOG(CalgaryGDP1) LOG(TOTEXPLOC(-1)) LOG(CalgaryPOP(-1)) C

Observations: 91

R-squared	0.99	Mean dependent var	9.13
Adjusted R-squared	0.99	S.D. dependent var	0.22
S.E. of regression	0.02	Sum squared resid	0.05
Durbin-Watson stat	1.82		

Appendix F: Detailed Fiscal Tables

This final appendix provides the estimates of net financial contribution of Calgarians to the three orders of government in Calgary. The estimates of expenditures incurred on and revenue received from Calgarians by each of the three orders of government (local, provincial and federal) are provided in the tables 26 and 27 below. The categories of expenditures and revenue are based on Statistics Canada's latest financial report titled "Revenue, expenditure and budgetary balance - General governments." The expenditure and revenue categories in the report are provided in table 25.

Table 26 provides revenue line items generated from Calgarians by each of the three orders of government, while table 27 highlights the expenditure line items incurred on Calgarians by these orders of government. In table 28, aggregate revenue from and expenditures incurred on Calgarians by all orders of government are used to determine net financial contributions (defined as the difference between total revenue and current expenditures plus net capital transfers plus fixed capital consumption allowance minus acquisition of non-financial assets). The estimate of net financial contribution is presented with and without intergovernmental transfers.

Table 25.

Revenue	Expenditure
Taxes on incomes - From households	Gross current expenditure on goods and services
Taxes on incomes - From corporations and govt business	Current transfers to households
Taxes on incomes - From non-residents	▪ Employment Insurance
Contributions to social insurance plans	▪ Old Age Security
Taxes on production and imports:	▪ Child Tax Benefits and Universal Childcare Benefit
▪ GST/PST (accrual basis)	▪ Other current transfers to persons
▪ Other non-GST/PST taxes on production and imports	Current transfers to non-profits serving households
Other current transfers from households	Subsidies
Current transfers from non-profits	Current transfers to federal government
Investment Income:	Current transfers to provincial goverments
▪ Royalties	▪ Canadian health and social transfer
▪ Non-royalty investment income	▪ Other non-CHST, no taxation agreements, transfers from federal government
Current transfers from federal government	Current transfers to local and aboriginal governments
▪ Canadian health and social transfer	Interest on debt
▪ Other non-CHST, no taxation agreements, transfers from federal government	Acquisition of non-financial assets
Current transfers from provincial and territorial governments	Consumption of Fixed Capital
Current transfers from local and aboriginal governments	Net Capital Transfers

Year	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Taxes on incomes - From households	2,075	2,053	1,828	2,111	2,379	2,611	3,124	3,888	3,277	4,014	4,428	4,041	4,110	4,577	5,535	6,330	7,325	7,400	6,457	6,206	6,649	7,268	7,688
Taxes on incomes - From corporations and govt business	802	822	997	1,138	1,229	1,434	1,782	1,796	2,202	3,140	2,427	2,648	2,980	3,627	4,126	5,683	5,859	6,693	6,244	6,462	7,332	7,009	6,714
Taxes on incomes - From non-residents	23	23	25	25	29	42	44	42	50	56	67	66	62	67	77	102	100	110	82	82	82	86	93
Contributions to social insurance plans	414	482	505	541	531	529	571	547	529	559	570	569	557	550	591	650	674	671	663	678	735	810	887
Taxes on production and imports	813	834	917	809	837	912	1,035	1,027	1,001	1,084	1,170	1,302	1,391	1,412	1,507	1,663	1,703	1,565	1,462	1,626	1,756	1,829	1,915
GST/PST (accrual basis)	469	465	524	507	527	575	651	666	685	768	820	902	974	1,005	1,088	1,199	1,228	1,069	979	1,100	1,200	1,268	1,340
Other non-GST/PST taxes on production and imports	344	369	392	302	310	337	385	361	316	316	350	400	417	408	419	465	475	496	483	527	556	561	574
Other current transfers from households	1	2	2	1	1	2	1	1	0	1	1	1	0	1	1	1	1	1	1	3	1	1	2
Investment Income	148	141	113	115	125	121	140	149	152	205	179	176	184	146	146	161	198	223	164	179	230	239	261
Gross current expenditure on goods and services	614	631	661	658	658	624	610	624	675	765	795	864	894	918	972	998	1,005	1,070	1,173	1,226	1,273	1,260	1,295

Year	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Current transfers to households	866	963	1,014	1,004	985	983	961	1,009	1,092	1,115	1,218	1,321	1,373	1,402	1,415	1,558	1,766	1,806	2,104	2,134	2,128	2,155	2,223
Employment Insurance	287	331	319	271	239	198	162	162	186	157	184	255	270	244	217	197	202	232	504	476	380	330	352
Old Age Security	303	325	346	367	381	400	423	444	460	479	498	524	590	609	633	636	637	667	711	718	787	830	917
Child Tax Benefits and Universal Childcare Benefit	0	0	138	139	139	141	146	155	166	191	221	241	238	256	284	360	464	463	457	479	505	526	539
Other current transfers to persons	201	237	141	156	161	170	170	165	189	208	240	228	226	237	233	245	299	280	290	310	319	327	334
Current transfers to non-profits serving households	5	7	16	12	10	9	26	39	42	46	46	59	60	70	79	59	82	93	122	119	115	111	103
Subsidies	226	154	72	75	62	63	93	106	66	75	113	75	144	227	186	122	96	103	120	124	126	114	102
Current transfers to provincial	599	728	619	542	535	688	686	660	912	1,139	1,147	1,212	1,939	1,148	1,108	975	968	1,231	1,255	1,473	1,477	1,401	1,464
Canadian health and social transfer	0	0	0	0	0	237	269	246	362	463	447	384	586	620	779	605	665	838	882	936	985	1,053	1,126
Other non-CHST, no taxation agreements, transfers from federal	599	728	619	542	535	451	417	414	550	676	700	828	1,353	528	328	369	303	393	373	537	492	348	338
Current transfers to local and aboriginal	50	54	49	47	47	47	46	45	49	47	50	52	52	56	71	33	34	24	18	19	19	19	20
Interest on debt	1,038	1,000	996	1,023	1,183	1,175	1,147	1,193	1,209	1,271	1,182	1,057	1,017	967	952	978	977	940	836	864	887	836	812
Acquisition of non-financial assets	92	71	77	81	97	55	97	92	68	67	102	74	50	67	89	116	65	127	117	121	107	130	105
Consumption of Fixed Capital	81	84	87	88	89	95	98	99	103	108	112	111	107	111	119	127	134	144	144	140	143	174	151
Net Capital Transfers	-24	-2	19	14	24	-85	78	66	55	66	56	39	42	-1	-13	-18	-12	-15	-47	-34	-11	-3	4

Year	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Taxes on incomes - From households	1,067	978	859	1,090	1,166	1,322	1,555	1,886	1,657	1,952	1,649	1,633	1,651	1,793	2,128	2,547	2,838	3,119	2,505	2,288	2,506	2,899	3,182
Taxes on incomes - From corporations and govt business	464	357	472	662	807	1,098	1,281	886	1,016	1,904	1,365	1,483	1,116	1,478	1,853	2,290	2,517	2,740	2,787	2,986	3,416	3,360	3,323
Contributions to social insurance plans	122	114	146	155	133	118	124	131	107	111	158	207	274	285	290	316	306	305	288	300	317	336	356
Taxes on production and imports	609	603	687	947	1,032	1,054	1,128	1,160	1,178	1,309	1,357	1,480	1,566	1,679	1,757	1,999	2,078	2,020	1,996	2,065	2,146	2,238	2,350
GST/PST (accrual basis)	97	99	95	97	98	100	110	116	120	118	119	192	218	240	231	282	289	292	290	319	350	376	392
Other non-GST/PST taxes on production and imports	512	504	591	849	934	954	1,018	1,044	1,058	1,191	1,238	1,288	1,348	1,439	1,526	1,717	1,790	1,728	1,706	1,746	1,796	1,863	1,958
Other current transfers from households	182	200	211	237	253	267	295	311	323	325	353	416	453	455	463	487	529	565	276	488	511	534	558
Current transfers from non-profits	42	47	45	50	59	61	73	81	72	63	72	85	90	98	107	114	127	124	75	127	133	138	143
Investment Income	2,008	2,054	1,999	2,448	2,358	2,400	2,890	2,607	2,705	5,067	4,692	2,864	4,810	5,605	7,891	7,886	5,835	6,949	3,360	5,138	5,903	4,340	4,269
Royalties	1,023	1,005	1,123	1,578	1,360	1,523	1,862	1,496	1,680	4,106	3,891	2,312	3,868	4,439	6,422	6,126	4,410	5,916	2,241	3,843	4,602	3,080	2,940
Non-royalty investment income	985	1,050	876	871	998	877	1,028	1,111	1,026	961	801	552	942	1,166	1,468	1,761	1,425	1,034	1,119	1,295	1,301	1,261	1,329
Current transfers from federal	599	728	619	542	535	688	686	660	912	1,139	1,147	1,212	1,939	1,148	1,108	975	968	1,231	1,255	1,473	1,477	1,401	1,464
Canadian health and social transfer	0	0	0	0	0	237	269	246	362	463	447	384	586	620	779	605	665	838	882	936	985	1,053	1,126
Other non-CHST, no taxation agreements, transfers from federal	599	728	619	542	535	451	417	414	550	676	700	828	1,353	528	328	369	303	393	373	537	492	348	338

Year	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Gross current expenditure on goods and services	2,268	2,311	2,295	2,166	2,178	2,297	2,457	2,744	2,910	3,210	3,516	3,831	4,129	4,325	4,709	5,132	5,670	6,502	6,957	7,126	7,457	8,156	8,016
Current transfers from local and aboriginal	6	3	4	4	4	4	3	2	0	2	3	3	3	3	3	6	7	10	12	11	10	10	10
Gross current expenditure on goods and services	2,268	2,311	2,295	2,166	2,178	2,297	2,457	2,744	2,910	3,210	3,516	3,831	4,129	4,325	4,709	5,132	5,670	6,502	6,957	7,126	7,457	8,156	8,016
Current transfers to households	356	438	429	372	346	340	358	352	395	513	548	558	521	509	634	981	799	919	1,015	1,135	1,154	1,206	1,169
Current transfers to non-profits serving households	128	158	110	96	95	95	111	114	124	173	189	192	179	174	210	298	257	299	310	316	339	366	351
Subsidies	227	283	236	158	75	64	64	76	66	172	1,097	347	365	318	347	437	368	362	244	293	333	321	314
Current transfers to federal	5	4	5	5	9	12	13	10	9	2	0	0	0	0	0	0	0	0	0	0	0	0	0
Current transfers to local and aboriginal	718	705	693	828	915	890	959	957	1,094	1,127	1,255	1,220	1,184	1,372	1,687	1,918	2,161	2,421	2,533	2,906	2,871	2,843	2,908
Interest on debt	508	552	555	601	585	545	518	532	442	415	352	264	197	190	174	169	172	172	167	174	186	192	196
Acquisition of non-financial assets	386	376	316	267	167	179	203	255	406	455	616	592	664	795	893	1,004	1,326	1,585	1,593	1,332	1,575	1,604	1,680
Consumption of Fixed Capital	329	338	345	352	359	368	378	385	401	436	467	510	549	596	661	753	862	986	1,044	845	1,078	1,157	1,268
Net Capital Transfers	-41	-26	-15	-10	-4	-1	-2	0	0	-1	-1	-18	-22	-7	-5	-2	0	0	0	0	0	0	0

Table 26C. Local

Year	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Taxes on production and imports	688	721	746	585	542	600	632	688	693	760	824	845	899	982	1,062	1,253	1,427	1,549	1,597	1,694	1,716	1,824	1,892
Other current transfers from households	13	16	16	18	16	18	20	22	24	27	29	30	33	35	37	40	45	48	52	64	62	61	62
Investment Income	234	258	216	241	281	248	291	328	268	363	339	273	327	502	390	346	325	289	239	360	329	321	323
Current transfers from federal	50	54	49	47	47	47	46	45	49	47	50	52	52	56	71	33	34	24	18	19	19	19	20
Current transfers from provincial and territorial	718	705	693	828	915	890	959	957	1,094	1,127	1,255	1,220	1,184	1,372	1,687	1,918	2,161	2,421	2,533	2,906	2,871	2,843	2,908
Gross current expenditure on goods and services	1,281	1,343	1,385	1,365	1,396	1,432	1,492	1,627	1,677	1,873	1,955	2,101	2,303	2,322	2,490	2,725	2,960	3,301	3,528	3,663	3,838	4,181	4,110
Current transfers to households	12	13	13	14	12	12	12	13	10	10	20	23	27	28	31	44	47	88	71	74	80	94	87
Current transfers to non-profits serving households	0	0	0	0	0	0	0	0	0	0	1	2	3	4	5	7	7	10	10	11	11	12	11
Subsidies	42	41	44	43	45	45	49	40	48	42	48	50	55	61	64	66	68	79	71	84	86	87	87
Interest on debt	189	192	188	186	184	177	163	151	143	135	168	155	153	154	120	114	111	114	117	119	116	115	115
Acquisition of non-financial assets	265	282	279	239	261	253	273	312	342	403	457	598	419	400	557	889	1,116	1,262	1,365	1,378	1,371	1,356	1,149
Consumption of Fixed Capital	232	242	250	262	279	292	312	324	335	350	363	385	406	428	463	528	595	688	739	667	804	780	629

Table 27.

Year	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Total Current Expenditures																							
Federal	3,397	3,538	3,426	3,360	3,479	3,590	3,569	3,676	4,046	4,457	4,550	4,640	5,478	4,788	4,783	4,723	4,928	5,268	5,629	5,960	6,025	5,896	6,020
Provincial	4,211	4,450	4,323	4,226	4,204	4,242	4,480	4,785	5,039	5,611	6,958	6,411	6,574	6,888	7,761	8,936	9,426	10,674	11,226	11,951	12,340	13,084	12,953
Local	1,525	1,590	1,630	1,609	1,637	1,666	1,717	1,831	1,878	2,060	2,193	2,330	2,540	2,569	2,710	2,955	3,193	3,592	3,798	3,951	4,131	4,489	4,410
Total Expenditures, without transfers																							
Federal	3,149	3,185	3,106	3,154	3,302	3,227	3,262	3,391	3,512	3,749	3,916	3,886	3,972	4,119	4,189	4,350	4,565	4,691	5,033	5,202	5,261	5,207	5,254
Provincial	4,269	4,562	4,390	4,140	3,935	4,060	4,345	4,785	5,074	5,784	7,289	6,706	7,020	7,396	8,244	9,425	10,138	11,491	11,893	12,159	12,841	13,628	13,444
Local	2,014	2,130	2,180	2,151	2,211	2,257	2,375	2,565	2,642	2,957	3,191	3,435	3,497	3,551	3,943	4,589	5,117	5,693	5,978	6,246	6,428	6,760	6,442
Total Expenditures																							
Federal	3,465	3,606	3,523	3,456	3,600	3,561	3,744	3,834	4,169	4,590	4,709	4,754	5,570	4,854	4,859	4,821	4,981	5,379	5,700	6,047	6,120	6,023	6,129
Provincial	4,556	4,801	4,624	4,483	4,367	4,420	4,681	5,041	5,445	6,066	7,572	6,986	7,217	7,675	8,648	9,938	10,751	12,260	12,819	13,282	13,914	14,688	14,633
Local	1,791	1,871	1,909	1,848	1,898	1,919	1,990	2,144	2,220	2,463	2,651	2,959	2,959	2,969	3,267	3,844	4,309	4,854	5,162	5,328	5,502	5,845	5,559
Total Current Expenditures																							
Federal	3,397	3,538	3,426	3,360	3,479	3,590	3,569	3,676	4,046	4,457	4,550	4,640	5,478	4,788	4,783	4,723	4,928	5,268	5,629	5,960	6,025	5,896	6,020
Provincial	4,211	4,450	4,323	4,226	4,204	4,242	4,480	4,785	5,039	5,611	6,958	6,411	6,574	6,888	7,761	8,936	9,426	10,674	11,226	11,951	12,340	13,084	12,953
Local	1,525	1,590	1,630	1,609	1,637	1,666	1,717	1,831	1,878	2,060	2,193	2,330	2,540	2,569	2,710	2,955	3,193	3,592	3,798	3,951	4,131	4,489	4,410
Total Current Revenue																							
Federal	4,276	4,358	4,386	4,740	5,130	5,650	6,698	7,450	7,211	9,058	8,842	8,804	9,283	10,381	11,983	14,590	15,859	16,663	15,074	15,236	16,785	17,241	17,560
Provincial	5,099	5,085	5,042	6,134	6,348	7,013	8,034	7,723	7,970	11,872	10,796	9,382	11,902	12,545	15,599	16,620	15,205	17,064	12,554	14,875	16,419	15,258	15,655
Local	1,703	1,754	1,720	1,720	1,803	1,804	1,947	2,039	2,128	2,322	2,497	2,420	2,495	2,947	3,247	3,590	3,993	4,332	4,439	5,045	4,996	5,067	5,205
Total Revenue without Transfers																							
Federal	4,741	4,890	4,826	5,326	5,808	6,338	7,469	8,433	8,175	10,256	10,172	10,052	10,611	11,924	13,836	16,506	18,032	18,873	17,125	17,322	18,808	19,444	19,878
Provincial	4,846	4,740	4,796	6,085	6,345	6,890	7,972	7,717	7,719	11,735	10,676	8,973	11,057	12,774	16,355	17,478	15,883	17,805	12,722	15,168	16,840	15,601	15,979
Local	1,529	1,686	1,700	1,581	1,566	1,609	1,736	1,830	1,764	1,981	2,059	2,007	2,120	2,428	2,470	2,703	2,938	3,089	3,107	3,370	3,430	3,647	3,803

Table 27. ...*continued*

Year	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Total Revenue																							
Federal	4,252	4,355	4,405	4,755	5,155	5,566	6,776	7,516	7,266	9,125	8,899	8,843	9,325	10,380	11,971	14,572	15,846	16,647	15,027	15,202	16,774	17,239	17,564
Provincial	5,058	5,059	5,028	6,124	6,344	7,012	8,032	7,723	7,970	11,871	10,795	9,365	11,880	12,537	15,594	16,618	15,204	17,064	12,554	14,875	16,419	15,258	15,655
Local	1,703	1,754	1,720	1,720	1,803	1,804	1,947	2,039	2,128	2,322	2,497	2,420	2,495	2,947	3,247	3,590	3,993	4,332	4,439	5,045	4,996	5,067	5,205
Net-Intergovernmental Transfers																							
Federal	-649	-782	-668	-589	-582	-736	-732	-705	-961	-1,185	-1,196	-1,265	-1,991	-1,204	-1,179	-1,007	-1,002	-1,255	-1,274	-1,492	-1,496	-1,420	-1,484
Provincial	-118	23	-75	-288	-386	-210	-283	-304	-191	12	-106	-5	758	-221	-577	-937	-1,187	-1,179	-1,266	-1,422	-1,383	-1,432	-1,434
Local	768	758	742	876	963	937	1,005	1,001	1,143	1,173	1,305	1,272	1,236	1,428	1,759	1,951	2,196	2,445	2,551	2,926	2,889	2,862	2,928
Capital Spending																							
Federal	67	68	96	96	121	-30	175	158	123	134	159	114	93	66	76	98	53	111	70	87	96	127	109
Provincial	344	351	301	257	163	178	201	255	406	454	614	574	643	787	887	1,002	1,326	1,585	1,593	1,332	1,575	1,604	1,680
Local	265	282	279	239	261	253	273	312	342	403	457	598	419	400	557	889	1,116	1,262	1,365	1,378	1,371	1,356	1,149
Current Revenue Intergovernmental Transfer																							
Federal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Provincial	605	732	623	546	539	692	689	662	912	1,141	1,149	1,215	1,942	1,151	1,111	981	974	1,242	1,267	1,484	1,487	1,411	1,474
Local	768	758	742	876	963	937	1,005	1,001	1,143	1,173	1,305	1,272	1,236	1,428	1,759	1,951	2,196	2,445	2,551	2,926	2,889	2,862	2,928
Total Revenue Intergovernmental Transfers																							
Federal	-24	-2	19	14	24	-85	78	66	55	66	56	39	42	-1	-13	-18	-12	-15	-47	-34	-11	-3	4
Provincial	564	706	608	535	534	691	687	662	912	1,140	1,148	1,197	1,920	1,143	1,106	979	974	1,242	1,267	1,484	1,487	1,411	1,474
Local	768	758	742	876	963	937	1,005	1,001	1,143	1,173	1,305	1,272	1,236	1,428	1,759	1,951	2,196	2,445	2,551	2,926	2,889	2,862	2,928

Table 28.

| Year	Net Financial Contribution or Net Lending			Net Financial Contribution or Net Lending without transfers		
	Federal	Provincial	Local	Federal	Provincial	Local
1991	879	888	178	1,527	1,006	-590
1992	820	635	164	1,602	612	-595
1993	959	720	90	1,627	795	-652
1994	1,380	1,908	111	1,969	2,197	-765
1995	1,651	2,144	166	2,234	2,530	-797
1996	2,060	2,771	137	2,796	2,980	-800
1997	3,129	3,554	230	3,861	3,837	-775
1998	3,774	2,938	208	4,479	3,242	-794
1999	3,165	2,931	249	4,127	3,122	-894
2000	4,602	6,260	263	5,787	6,248	-910
2001	4,292	3,838	304	5,489	3,944	-1,001
2002	4,164	2,971	90	5,428	2,976	-1,182
2003	3,805	5,327	-44	5,796	4,569	-1,280
2004	5,592	5,657	378	6,796	5,878	-1,050
2005	7,201	7,838	537	8,380	8,414	-1,222
2006	9,866	7,684	635	10,873	8,622	-1,315
2007	10,931	5,779	800	11,933	6,966	-1,396
2008	11,395	6,390	740	12,650	7,570	-1,705
2009	9,444	1,328	642	10,718	2,594	-1,910
2010	9,276	2,925	1,094	10,768	4,347	-1,832
2011	10,760	4,079	865	12,256	5,463	-2,024
2012	11,345	2,174	578	12,765	3,606	-2,284
2013	11,539	2,702	795	13,024	4,136	-2,133

The tables above provide distributions of both revenue from and expenditures incurred on Calgarians by each of the three orders of government. The Conference Board of Canada (CBoC) generated estimates of revenue from and expenditures on Albertans, from updated Statistics Canada national accounts data reported at the aggregate level for all Canadian provinces. The same allocators used by CBoC were used to generate estimates of revenue received from and expenditures incurred on Calgarians by the three orders of government. The estimates are the best available estimates in the absence of official Statistics Canada data.

To address potential data validity concerns, the net financial contribution estimates generated for the 1991 to 2009 period were compared with estimates from the old provincial accounts database previously provided by Statistics Canada. The new estimates are consistent with the old database. The comparison of the provincial accounts data on revenue and expenditures for the federal, provincial and local government for these two data sets is provided in figures D1-D3.

Federal government revenue is identical using the old and new database, while federal government expenditures are slightly higher. Provincial government expenditures are identical using the old and new database, while provincial government revenue is slightly higher. Local government expenditures may be more overstated than local government revenue[2].

Figure D1.   The Ratio of New to Old Revenue and Expenditures Accounts Data for Federal Government
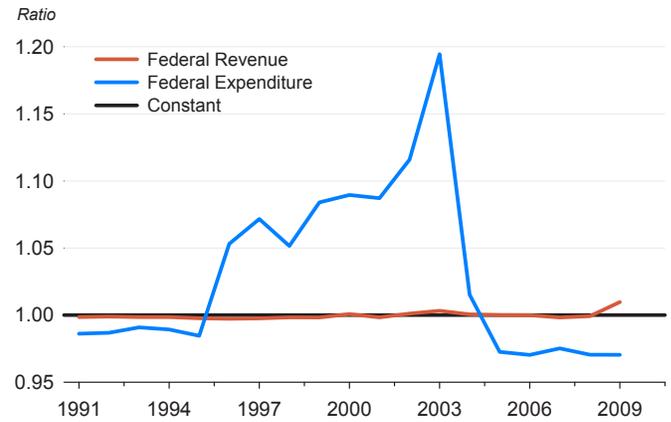

Source: Statistics Canada, Corporate Economics.

Figure D2.   The Ratio of New to Old Revenue and Expenditures Accounts Data for Provincial Government
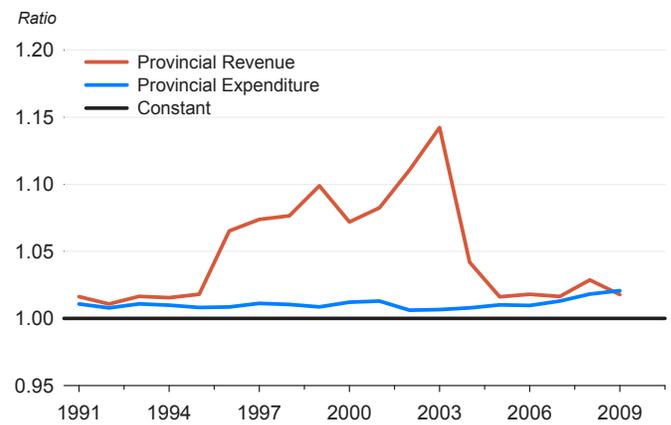
Source: Statistics Canada, Corporate Economics.

Figure D3.   The Ratio of New to Old Revenue and Expenditures Accounts Data for Local Government
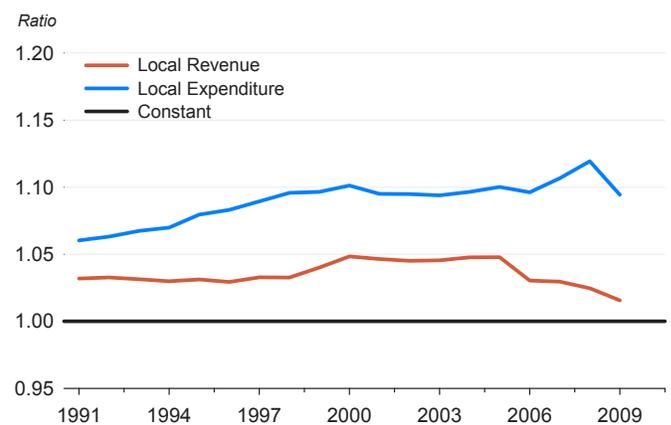
Source: Statistics Canada, Corporate Economics.

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2   Any deviation away from a ratio of one implies adjustments (updates) to expenditures or revenue have been made.

WHO WE ARE

Corporate Economics provides services in four areas: forecasting, information provision, policy analysis and consulting. We also monitor the current economic trends which allows us to develop unique insights on how external events are impacting the local economy and the Municipal government. We are experienced at researching different economic topics and have developed reliable methods of forecasting and analysis.

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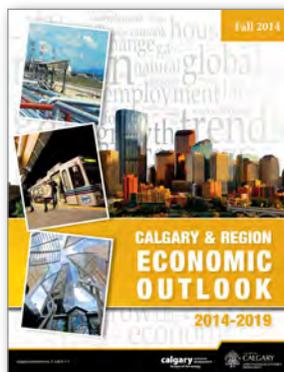
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Corporate Research Analyst: Estella Scruggs

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