A Portrait of the Productivity Performance of the Canadian Provinces, 1997-2007

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ABSTRACT

This article, based on the CSLS Provincial Productivity Database, provides a portrait of the productivity performance of the ten Canadian provinces over the 1997-2007 period. Level and growth rate estimates of labour and multifactor productivity are presented and discussed, with an emphasis on the provinces' market sector. Two-digit NAICS industry level estimates are also presented. Capital intensity and labour quality figures are also provided, and a standard growth accounting framework is used to determine the sources of labour productivity growth, as well as the sources of labour productivity level gaps between Canada and the provinces.

RÉSUMÉ

Ce document dresse un portrait de la productivité des 10 provinces canadiennes sur la période 1997 2007. Cette description se fonde sur la base de données de la productivité des provinces du CENV. L'ouvrage présente et examine des estimations des niveaux et des taux de croissance de la productivité du travail et la productivité multifactorielle, en s'intéressant tout particulièrement au secteur du marché. Il livre aussi un état prévisionnel du niveau des industries présentées par leur code à deux chiffres du SCIAN. On y trouve enfin des données sur l'intensité capitalistique, la qualité du travail, les sources de croissance de la productivité du travail et les sources des écarts du niveau de la productivité du travail entre le Canada et les provinces.

PRODUCTIVITY IS THE KEY FACTOR that determines living standards in the long run. If the amount of output each worker produces does not increase, real wages and incomes cannot rise (Sharpe, 2010a). Since 2000, Canada's labour productivity growth has been abysmal, both from an historical and an international perspective (Sharpe and Thomson, 2010b).[2] Improving this poor performance must be a key objective of Canada's economic agenda. To develop policies with this goal in mind, it is important to understand the nature of labour

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2 From 1973 to 2000, labour productivity (output per hour) in Canada's business sector grew at an average annual rate of 1.6 per cent. In the 2000-2010 period, labour productivity growth dropped sharply to a mere 0.7 per cent per year in Canada. This slowdown in labour productivity growth was not experienced in the United States, where productivity grew at an average annual rate of 2.6 per cent during the same period (up from 2.0 per cent during the 1973-2000 period). Detailed data on labour productivity in Canada and the United States can be found at the CSLS Aggregate Income and Productivity Trends: Canada vs United States database at http://www.csls.ca/data/ipt1.asp.

productivity at both the national and provincial levels, including the sources of growth at the market sector and industry levels.

This article represents a synthesis of ten provincial productivity reports prepared by the Centre for the Study of Living Standards (CSLS) for Industry Canada (de Avillez and Ross, 2011; de Avillez, 2011a-e; Ross, 2011a-e). It provides a portrait of the productivity performance of the ten provinces over the 1997-2007 period, based on estimates from the CSLS Provincial Productivity Database, which were developed in collaboration with Statistics Canada. Level and growth rate estimates of labour and multifactor productivity are discussed, with an emphasis on the market sector. Two-digit NAICS industry level estimates are also presented. In addition, capital intensity and labour quality estimates are provided, and a standard growth accounting framework is used to calculate the sources of labour productivity growth.[3]

This article is divided into three sections. The first section provides a brief overview of basic concepts related to productivity, along with the methodology and the data sources used. Section two provides an overview of the productivity performance of the provinces focusing in the following topics: labour productivity, multifactor productivity, sources of labour productivity growth in the market sector, and sources of the labour productivity level gap at the market sector. Section three summarizes the productivity performance of each province.[4]

Basic Concepts, Methodology and Data Sources

In this section, we first define the main concepts used in this article, as well as explain important topics related to productivity analysis —such as the difference between partial and total productivity measures, and the distinction between productivity growth rates and levels. This is followed by a brief discussion on methodology and data sources.

Productivity is, broadly speaking, a measure of how much output is produced per unit of input used. Several productivity measures can be calculated using different definitions of outputs and inputs. In this sub-section, we define the input, output and productivity measures used throughout this article:

- The **labour services input** is defined as total *quality adjusted* hours worked in a particular sector or in the market sector as a whole. It is the weighted sum of hours worked across different categories of workers, with the weights being equal to relative labour compensation shares.
- **Labour quality** (also known as **labour composition**) is defined as the ratio of labour input to hours worked (*unadjusted* by quality). The variables used to differentiate labour quality are education (four education levels), experience (proxied by seven age groups) and class of workers (paid employ-

3 This article and the reports underlying it builds on and extends earlier CSLS work on provincial productivity. The CSLS Provincial Productivity Database is available at http://www.csls.ca/data/mfp_new.asp. Previous CSLS articles using this database include Sharpe and Arsenault (2009), Sharpe (2010b) and Sharpe and Thomson (2010a, 2010b).

4 Appendix Tables for this article are available on the CSLS website (www.csls.ca/ipm/21/appendix-deavillez-ross.pdf). They provide a number of additional estimates for Canada and all ten provinces at the market sector level and at the two-digit NAICS industry level, including: nominal GDP and hours worked shares in 1997, capital services productivity (growth rates, levels and rankings), capital services intensity (growth rates, levels and rankings), labour quality (growth rates and rankings), contribution of capital services intensity growth to labour productivity growth (percentage points and per cent), contribution of capital composition intensity growth to labour productivity growth (percentage points and per cent), contribution of capital stock intensity growth to labour productivity growth (percentage points and per cent), contribution of multifactor productivity growth to labour productivity growth (percentage points and per cent), and contribution of labour quality growth to labour productivity growth (percentage points and per cent).

ees versus self-employed workers). Overall, there are 56 different categories of workers.[5]

- The **capital services input** represents the flow of services provided by the capital stock. The difference between capital stock and capital services stems from the fact that not all forms of capital assets provide services at the same rate. Short-lived assets, such as a car or a computer, must provide all of their services in just a few years before they completely depreciate. Office buildings provide their services over decades. As a consequence, over a single year, a dollar's worth of a car provides relatively more capital services than a dollar's worth of a building. Thus, capital services growth is driven by: 1) increases in the level of **capital stock**; and 2) shifts in the **capital composition** caused by more investment in assets that provide relatively more services per dollar of capital stock (i.e. short lived assets).
- **Capital intensity** is defined as capital services per hour worked.
- **Gross domestic product (GDP)** measures the value of all *final* goods and services produced in a defined geographic region during a certain time period, typically a year or a quarter.
- **Labour productivity** is defined as real GDP per hour worked.
- **Multifactor Productivity (MFP)** growth is measured as the difference between real output growth and combined input growth. In other words, MFP reflects output growth that is not accounted for by input growth. The inputs that are taken into account to construct a combined input aggregate vary whether MFP is calculated using a gross output basis or a value added basis. The gross output basis takes into consideration labour, capital, and intermediate inputs, while the value added basis takes into account only capital and labour (because intermediate consumption is already subtracted from value added). Thus, MFP captures the residual effects of several elements of the production process, such as improvements in technology and organizations, capacity utilization, increasing returns to scale, mismeasurement, etc. In this article, MFP growth is calculated on a value added basis.

When discussing productivity, there are two important dimensions to consider. The first is whether productivity is measured using a partial productivity approach or a multifactor productivity approach. The second is whether the focus is on growth rates, levels, or both.

There is a fundamental distinction between partial and multifactor productivity (MFP). Partial productivity measures refer to the relationship between output and a single input, such as labour or capital. Multifactor productivity, on the other hand, attempts to measure how efficiently all factors of production are used in the production process. This article provides estimates for one partial productivity measure, labour productivity (the most commonly used measure of productivity), as well as multifactor productivity.[6]

Productivity can be expressed either in growth rates or in levels. The economics literature largely focuses on productivity growth rates, which reflect, for instance, increases in *real* output per hour. In this article, we are also interested in making level comparisons between provinces. Ideally, productivity level comparisons are made in terms of current dollars (i.e. using *nominal* GDP), as these estimates capture changes in relative prices. However, at the time the CSLS Provincial Pro-

5 For more information on how Statistics Canada calculates labour quality, see Gu *et al* (2002).

6 Estimates of capital productivity can be found in the Appendix Tables (www.csls.ca/ipm/21/appendix-deavillez-ross.pdf).

ductivity Database was constructed, nominal GDP figures at the industry level were available only up to 2005. As a consequence, the productivity levels for 2007 were calculated using real GDP.[7]

As mentioned above, this article makes provincial comparisons of both productivity levels and growth rates. These comparisons are done both at the **market sector level** and at the **two-digit NAICS industry level**.[8] The North American Industry Classification System (NAICS) breaks down the economy into 20 sectors.

The market sector is comprised of 17 of the 20 sectors. The only three sectors that are not included in the market sector are: education services, health care and social assistance, and public administration. For practical purposes, we have grouped the finance and insurance, real estate, rental and leasing, and management of companies and enterprises sectors into only one sector, which will be referred to as the finance, insurance, real estate, rental and leasing (FIRE) sector. Since this change is only a slight departure from the standard NAICS breakdown, we will still refer to these 15 sectors as NAICS sectors.

The provincial comparisons are done by ranking the productivity growth rates and levels of different provinces from 1 (highest) to 10 (lowest). Each province has two market sector ranks: an **equally-weighted rank** and an **industry composition weighted rank**. The industry composition weighted market sector rank, which will be referred throughout this article simply as the market sector rank, takes into account the relative size of the 15 two-digit NAICS industries that comprise a province's market sector. Thus, it gives more weight to the sectors that comprise a more significant part of the province's economy. The equally-weighted market sector rank, as the name implies, attributes equal weights to all industries. Comparing the two ranks allows for important characteristics of the province's productivity performance to be identified. A province with a high market sector rank and a low equally-weighted market sector rank in labour productivity growth, for instance, will most likely have strong labour productivity growth in its largest industries, but low productivity growth in most of the fifteen two-digit NAICS industries.

Lastly, we also perform **growth accounting** exercises in order to measure how different factors contributed to labour productivity growth. The growth accounting framework used in this article is the same as the one used in Sharpe and Thomson (2010a). It assumes a Cobb-Douglas production function such that:

Exhibit A
The North American Industry Classification System (NAICS) at the Two-Digit Level

Sector Number	Description
11	Agriculture, Forestry, Fishing and Hunting
21	Mining, and Oil and Gas Extraction
22	Utilities
23	Construction
31-33	Manufacturing
42	Wholesale Trade
44-45	Retail Trade
48-49	Transportation and Warehousing
51	Information and Cultural Industries
52	Finance and Insurance
53	Real Estate, Rental and Leasing
54	Professional, Scientific, and Technical Services
55	Management of Companies and Enterprises
56	Administrative and Support, Waste Management and Remediation Services
61	Education Services (non-market)
62	Health Care and Social Assistance (non-market)
71	Arts, Entertainment, and Recreation
72	Accommodation and Food Services
81	Other Services (except Public Administration)
92	Public Administration (non-market)

7 One advantage of using real GDP instead of nominal GDP for the level comparisons is that the productivity growth rates and levels are consistent with each other. Regardless of whether nominal or real GDP figures are used for productivity level comparisons, it is important to note that these comparisons should be used with caution, due not only to differences in industry composition between provinces, but also due to the lack of industry purchasing power parities (PPPs) estimates at the provincial level.

8 The words *industry* and *sector* are used interchangeably in this article.

$$Y = AK^{\alpha}L^{1-\alpha}$$

where Y is real output, K stands for capital services, L for labour input (quality adjusted hours), A for multifactor productivity and α is the share of output that takes the form of capital compensation.

Contributions to labour productivity growth were broken down into three factors: 1) capital intensity;[9] 2) labour quality (or labour composition); and 3) multifactor productivity. This decomposition is quite intuitive:

- Workers who have access to more capital (i.e. higher capital intensity) tend to have, *ceteris paribus*, higher labour productivity. Imagine, for example, two teams with two workers each. In the first team, one worker has a shovel and the other has a snow blower. In the second team, both workers have snow blowers. The second team uses capital more intensively than the first, and thus is able to clear much more snow in the same period of time.
- Improvements in labour quality tend to increase the amount of output a worker can produce in a given time period. Thus, an experienced coal miner will normally be able to extract more coal than a novice miner in a given period.
- Technological progress can substantially increase output per worker. This can be seen, for instance, in the effect of disembodied technological change in the production process. Organizational changes can affect how efficiently firms use labour, capital, and other inputs, leading to stronger productivity growth.

Statistics Canada has detailed the methodologies and data sources used in the preparation of its estimates of multifactor productivity (MFP) at the national level in Baldwin *et al*. (2007). The provincial estimates used in this article have been prepared by Statistics Canada for the Centre for the Study of Living Standards (CSLS) and largely follow the methodologies used for the national estimates. There are, however, certain differences between the national and provincial estimates which are discussed in detail in Sharpe and Arsenault (2009). The CSLS has supplemented Statistics Canada data by calculating multifactor productivity level estimates for the provinces relative to the Canadian average (see Sharpe and Thomson, 2010a).

A Comparison of Provincial Productivity Performance

This section of the article highlights the most salient characteristics of labour and multifactor productivity performance across provinces at both the market sector level and the two-digit NAICS industry level. The section is divided into five parts. First, the industry composition of the provinces in terms of both output and hours worked is briefly discussed. Next, estimates of growth rates and levels of labour and multifactor productivity are presented. The sources of labour productivity growth in Canada and the provinces are then analyzed, followed by a discussion on the sources of the labour productivity gap between Canada and the provinces.

Output and Hours Worked by Industry

A province's industry structure can affect both its aggregate productivity level and growth rate. Consequently, it is useful to have a sense of the relative importance of each industry. Tables 1 and 2 (all tables are at the end of the article) show the shares of nominal GDP and hours worked for Canada and the ten provinces at the two-digit NAICS industry level in 2007.

9 Note, once again, that capital intensity has been defined as capital services per hour worked, *not* capital stock per hour worked.

One notes very large differences in industry structure across provinces. For example, mining and oil and gas extraction ranged from 59.7 per cent of nominal GDP in Newfoundland and Labrador to 0.0 in Prince Edward Island. The GDP share of manufacturing also ranged widely, from 22.8 per cent in Quebec to 5.0 per cent in Newfoundland and Labrador.

Labour Productivity

Table 3 shows the average annual growth rates for labour productivity at the market sector level and at the two-digit NAICS industry level for Canada and the ten provinces in the 1997-2007 period. Table 4 shows the provincial rankings.

Newfoundland and Labrador had the most rapid market sector labour productivity growth (4.8 per cent per year), and Alberta the lowest (1.0 per cent). It was the same industry in both provinces that drove this performance – mining and oil and gas extraction. In Newfoundland and Labrador, labour productivity in this particular industry grew at an astounding average annual rate of 15.3 per cent, compared to -4.3 per cent in Alberta. These divergent trends reflected the very different nature of this industry in the two provinces. In Newfoundland and Labrador the mining and oil and gas extraction sector represented less than 9 per cent of the province's GDP in 1997, but it grew rapidly over the period as production from the offshore oil wells took off. In Alberta, production shifted from low-cost conventional oil extraction to high-cost non-conventional, oil sands.

Yet when the productivity growth rates for the 15 industries are equally weighted, the aggregate rankings are reversed and Alberta has the highest ranking and Newfoundland and Labrador the lowest (Table 4). This paradox stems from the narrow base of Newfoundland and Labrador's productivity strength (four of the province's industries rank last in terms of labour productivity growth), in contrast to Alberta's much greater number of rapidly growing industries (five industries were ranked first or second).

Table 5 shows the labour productivity levels, expressed in terms of 1997 dollars per hour worked, for the market sector and the two-digit NAICS industries for Canada and the ten provinces in 2007. Table 6 shows the levels in relative terms (Canada is 100 for each industry) and Table 7 provides the rankings. Many observations can be made from this wealth of data. One of the most salient is that there are large variation in labour productivity levels, both across industries within a province and across provinces for the same industry. For example, in terms of the former, in Newfoundland and Labrador GDP per hour ranged from a high of $233.60 (1997 dollars) in mining, oil and gas extraction to a low of $11.00 in other services, a ratio of 21 to 1. In terms of the latter, labour productivity in mining and oil and gas extraction ranged from a high of $233.60 in Newfoundland and Labrador to a low of $28.10 in New Brunswick, a ratio of 8 to 1. These large labour productivity variations across the same industry reflect many factors, including differences in industry structure below the two-digit NAICS level, resource rents, factor prices, capital intensity, and efficiency.

Multifactor productivity

Table 8 shows the average annual growth rates of multifactor productivity for the market sector and 15 industries at the two-digit industry level in all 10 provinces for the 1997-2007 period. Table 9 shows the provincial rankings.

Newfoundland and Labrador again had the most rapid market sector multifactor productivity growth (4.1 per cent per year), and Alberta the lowest (-1.6 per cent). And, like labour productivity, it was the same industry in each prov-

ince that drove this performance – mining and oil and gas extraction. In Newfoundland and Labrador multifactor productivity in this industry grew at an amazing average annual rate of 18.8 per cent, compared to -7.4 per cent in Alberta. Again, when the productivity growth rates for the 15 industries are equally weighted, the aggregate rankings change significantly, with Newfoundland and Labrador dropping to ninth place and Alberta rising to fourth.

Table 10 shows the relative multifactor productivity levels for market sector and two-digit NAICS industries for the 10 provinces in 2007 (Canada is 100 for each industry). Table 11 provides the rankings. At the market sector level, Newfoundland and Labrador enjoyed the highest multifactor productivity level, 135.4 per cent of the national average, while Prince Edward Island had the lowest (74.1 per cent), closely followed, perhaps surprisingly, by Alberta (81.6 per cent). As was the case for labour productivity levels, when rankings are calculated with equal weights given to all 15 industries, Newfoundland and Labrador falls from first to ninth place, illustrating once more the narrow base upon which this province's strong productivity performance stands, and Alberta moves from ninth to fourth place.

Sources of Labour Productivity Growth

Chart 1 and Table 12 provide estimates for sources of labour productivity growth in the market sector for Canada and the provinces during the 1997-2007 period.[10]

Canada's market sector labour productivity growth of 1.71 per cent per year over the 1997-2007 period can be decomposed into its three components as follows: labour quality contributed 0.30 points, capital intensity 0.97 points, and multifactor productivity 0.44 points. In per cent terms, capital intensity growth was the most important source of labour productivity growth (56.6 per cent), followed by multifactor productivity (25.5 per cent), and labour quality (17.5 per cent).[11]

At the provincial level, the contributions of labour quality are fairly small, ranging from 0.08 points to 0.37 points or 5.5 per cent to 22.1 per cent. The per cent contributions depend of course on the magnitude of labour productivity growth. When productivity growth is low, a given percentage point contribution of labour quality translates into a much higher per cent contribution to labour productivity growth than it does when productivity growth is high.

In contrast to labour quality, the contribution of capital intensity to labour productivity growth by province ranged from 0.39 percentage points to 2.43 points, or from 8.0 per cent to 233.9 per cent. Multifactor productivity varied even more across provinces, from a low of -1.58 points to a high of 4.14 points, or from -152.5 per cent of labour productivity growth to 85.9 per cent.

Sources of the Labour Productivity Gap Relative to Canada by Province

Chart 13 shows the sources of the provinces' labour productivity gaps relative to Canada at the market sector level in 2007. The expression "labour productivity gap" is used here whenever the province's labour productivity level (either at the market sector level or at the two-digit

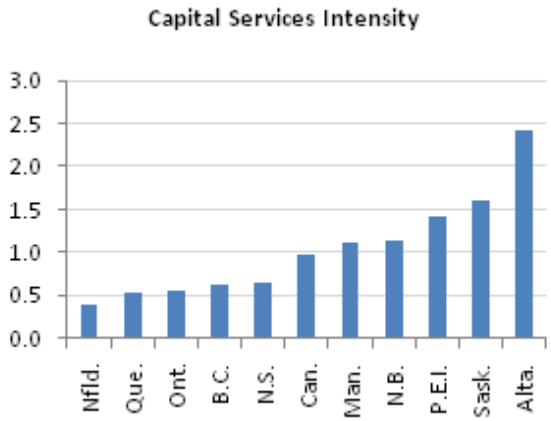
10 For estimates of the sources of labour productivity growth by province at the two-digit NAICS industry level, see the Appendix Tables (www.csls.ca/ipm/21/appendix-deavillez-ross.pdf).

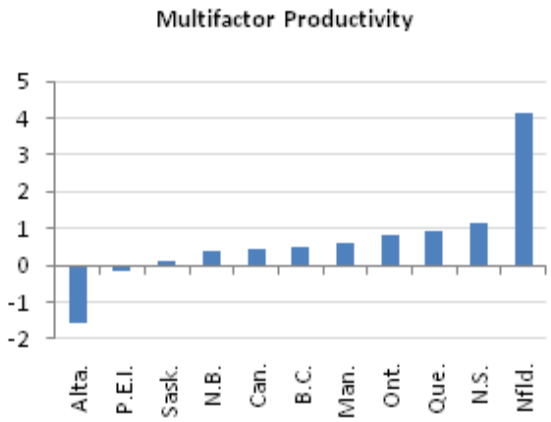
11 The percentage point contributions of labour quality (or composition) and capital intensity to labour productivity growth are calculated as the growth rate of these variables multiplied by the labour and capital income shares (respectively) in a particular sector (or the market sector as a whole). These shares are also provided in Table 12. Note that the contribution of multifactor productivity to labour productivity in percentage points is the same as the actual growth rate of multifactor productivity, i.e. MFP growth is not weighted by any income share.

Chart 1

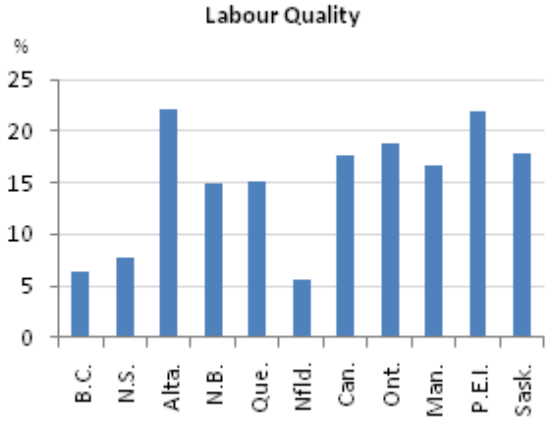
Percentage Point and Per Cent Contributions of Labour Quality, Capital Services Intensity, and MFP Growth to Labour Productivity in Canada and the Provinces, 1997-2007

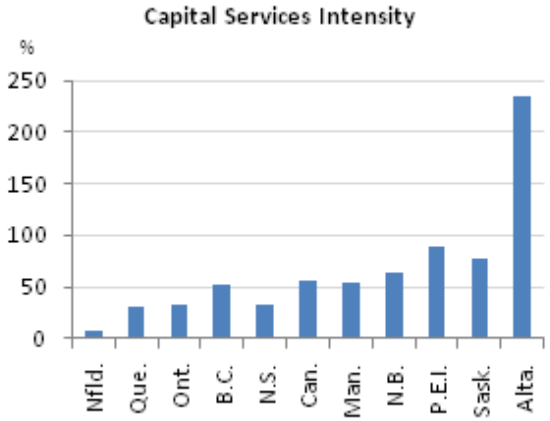
(a) Percentage Point Contributions (Average Annual Growth Rates)

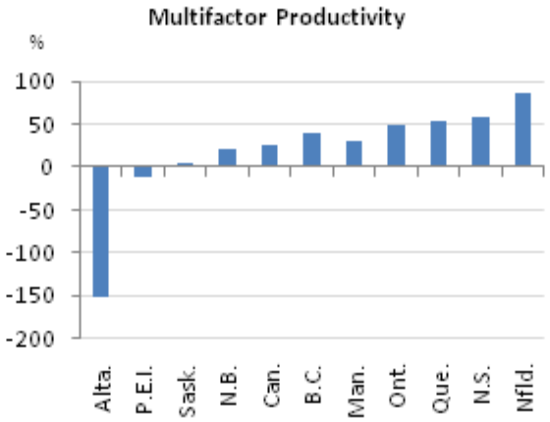




(b) Per Cent Contributions







NAICS industry level) is below the Canadian average. Whenever it is above the national average, the expression "positive differential" is used.

Newfoundland and Labrador had the highest labour productivity level among all the provinces, $39.6 per hour, which represented 109.7 per cent of the national average. This positive differential of 9.7 percentage points is explained in large part by the above average multifactor productivity level in Newfoundland and Labrador, which was able to offset the below average capital intensity level. Conversely, Prince Edward Island's labour productivity level was the lowest among all ten provinces, only $22.1 per hour, or 61.3 per cent of the Canadian level. This implies a labour productivity gap of 38.7 per cent, which was caused mainly by the province's below average multifactor productivity level, with the province's below average capital intensity level accentuating the gap.

Overall, seven provinces had labour productivity gaps relative to Canada in 2007, with below average capital intensity and multifactor productivity levels contributing to these gaps in approximately the same amount. The minor role played by labour quality levels in explaining labour productivity gaps should be interpreted with caution, because, due to data limitations, labour quality in all provinces were set to 100.0 in 1997. As a consequence, differences in labour quality levels prior to 1997 were captured by the multifactor productivity levels.

Productivity Growth by Province

This section of the article highlights the key productivity developments by province over the 1997-2007 period, moving from east to west. Readers are referred to the reports prepared by the Centre for the Study of Living Standards (de Avillez and Ross, 2011; de Avillez, 2011a-e; Ross, 2011a-e) on the productivity performance of each province for a more in-depth analysis. Tables 3-13 at the end of the article, as well as the Appendix Tables, provide the underlying data upon which these summaries of provincial productivity growth are based.

Newfoundland and Labrador: An Oil and Gas Extraction Story

As noted in the previous section, Newfoundland and Labrador experienced very strong labour productivity growth in the market sector from 1997 to 2007, with an average annual growth rate of 4.8 per cent, almost three times the national average of 1.7 per cent. In terms of labour productivity growth, Newfoundland's performance ranks first among the provinces. This growth was driven mainly by multifactor productivity growth, which accounted for 85.9 per cent of the increase observed over the 1997-2007 period. Capital intensity growth and labour quality growth played minor roles, accounting for 7.9 per cent and 5.5 per cent (respectively) of labour productivity growth

Newfoundland's labour productivity level in 2007 was $39.60 (1997 dollars) per hour, which represented 109.7 per cent of the Canadian level, up from 81.2 per cent in 1997. The province had the highest labour productivity level among all the ten provinces in 2007.

Despite ranking first in terms of labour productivity level in 2007, Newfoundland had labour productivity gaps relative to Canada in 12 of the 15 two-digit NAICS industries. In most cases, a below average multifactor productivity level was the main culprit.

Newfoundland's multifactor productivity in the market sector grew at an average rate of 4.1 per cent per year during the 1997-2007 period, ten times the national average of 0.4 per cent per year. The province ranked first in Canada.

A key observation is that Newfoundland's productivity performance in the market sector

was driven chiefly by the mining, and oil and gas extraction industry, which accounted for 60 per cent of the province's nominal GDP in 2007. On an individual basis, most of the province's industries had sub-par productivity performances.

Prince Edward Island: Falling Multifactor Productivity Dampens Labour Productivity Growth

Prince Edward Island experienced slightly below average labour productivity growth in the market sector from 1997 to 2007, with an average annual growth rate of 1.6 per cent (vs. 1.7 per cent in Canada). In terms of labour productivity growth, Prince Edward Island's performance ranked eighth among the provinces. Despite the low labour productivity growth overall, three of the 15 two-digit NAICS industries in the province enjoyed the highest growth rates in Canada when compared to equivalent industries in other provinces: other services (4.6 per cent per year), accommodation and food services (2.6 per cent per year), and professional, scientific and technical services (2.4 per cent per year).

Labour productivity growth in the province was driven mainly by capital intensity growth, which accounted for 88.2 per cent of the increase observed over the 1997-2007 period. Labour quality growth was responsible for 22.0 per cent of labour productivity growth, while multifactor productivity growth actually hindered growth, accounting for a reduction of 11.3 per cent of labour productivity growth.

Prince Edward Island's labour productivity level in 2007 was $22.11 (1997 dollars) per hour, which represented 61.3 per cent of the Canadian level, down from 62.1 per cent in 1997. The province had by far the lowest labour productivity level among all the ten provinces in 2007, significantly below the second worst province, Nova Scotia, which had a labour productivity level equal to 75.1 per cent of the Canadian level.

The province had labour productivity gaps relative to Canada in 14 of the 15 two-digit NAICS industries (the only exception was information and cultural industries). In most cases, the below average labour productivity levels were caused by below average multifactor productivity levels.

Prince Edward Island's multifactor productivity in the market sector declined at an average rate of 0.2 per cent per year during the 1997-2007 period, while in Canada it grew at an average rate of 0.4 per cent per year. The province ranked ninth.

Nova Scotia: Strong Productivity Growth, Low Levels

Nova Scotia experienced slightly higher labour productivity growth than Canada as a whole in the market sector from 1997 to 2007, with an average growth rate of 1.9 per cent per year, compared to the Canadian rate of 1.7 per cent per year. In terms of labour productivity growth, Nova Scotia's performance ranked fourth among the provinces. Despite solid labour productivity growth overall, three industries in the province witnessed declining labour productivity: arts, entertainment and recreation (-6.0 per cent per year), professional, scientific and technical services (-0.9 per cent) and utilities (-0.1 per cent).

Labour productivity growth in the province was driven mainly by multifactor productivity growth, which accounted for 58.4 per cent of the increase observed over the 1997-2007 period. Capital intensity growth accounted for 33.3 per cent of the growth. Finally, a small increase in labour quality was responsible for 7.6 per cent of the labour productivity growth experienced in the province.

Nova Scotia's labour productivity level in 2007 was $27.10 (1997 dollars) per hour, which represented 75.1 per cent of the Canadian level, up from 73.6 per cent in 1997. The province had the second lowest labour productivity level among the ten provinces in 2007.

In 2007, Nova Scotia had labour productivity gaps relative to Canada in 13 of the 15 two-digit NAICS industries. The largest gap was in arts, entertainment and recreation, where labour productivity was below the national rate by 44.8 per cent in 2007. In contrast, labour productivity in mining, oil and gas extraction was 14.4 per cent above the national level, and information and cultural industries were 2.9 per cent above the national average.

Nova Scotia's multifactor productivity in the market sector grew at an average rate of 1.1 per cent per year during the 1997-2007 period, well above the national average of 0.4 per cent per year. The province ranked second in Canada, behind Newfoundland.

New Brunswick: Labour Productivity Growth Driven by Capital Intensity

New Brunswick experienced slightly higher labour productivity growth than Canada as a whole in the market sector from 1997 to 2007, with an average growth rate of 1.8 per cent per year, compared to the Canadian rate of 1.7 per cent per year. In terms of labour productivity growth, New Brunswick's performance ranked fifth among the provinces. Four industries witnessed declining productivity: arts, entertainment and recreation (-5.5 per cent per year), mining, and oil and gas extraction (-4.8 per cent), utilities (-1.1 per cent) and administrative and support and waste management and remediation services (-1.1 per cent each).

Labour productivity growth in the province was driven mainly by capital intensity growth, which accounted for 63.4 per cent of the increase experienced over the 1997-2007 period. Multifactor productivity growth was responsible for 20.9 per cent of the growth. Finally, increased labour quality accounted for 14.8 per cent.

New Brunswick's labour productivity level in 2007 was $28.20 (1997 dollars) per hour, which represented 78.1 per cent of the Canadian level, up from 77.5 per cent in 1997. The province had the third lowest labour productivity level among the ten provinces in 2007.

In 2007, New Brunswick had labour productivity gaps relative to Canada in 13 of the 15 two-digit NAICS industries. The largest gap was in mining and oil and gas extraction, where labour productivity was below the national rate by 64.3 per cent in 2007. In contrast, labour productivity in agriculture, forestry, fishing and hunting was 36.1 per cent above the national level and information and cultural industries were 7.5 per cent above.

New Brunswick's multifactor productivity in the market sector grew at an average rate of 0.4 per cent per year during the 1997-2007 period, the same as the national average. The province ranked sixth in Canada.

Quebec: Superior Multifactor Productivity Growth, Weak Capital Intensity Growth

Quebec experienced slightly higher labour productivity growth than Canada as a whole in the market sector from 1997 to 2007, with an average growth rate of 1.8 per cent per year, compared to the Canadian rate of 1.7 per cent per year. In terms of labour productivity growth, Quebec's performance ranked sixth among the provinces. Only two industries in the province witnessed declining productivity: utilities (-1.5 per cent) and arts, entertainment and recreation (-0.4 per cent per year).

Labour productivity growth in the province was driven mainly by multifactor productivity growth, which accounted for 53.6 per cent of the increase experienced over the 1997-2007 period.

Capital intensity growth accounted for 30.5 per cent of the growth, while labour quality was responsible for 15.1 per cent of the labour productivity growth experienced in the province.

Quebec's labour productivity level in 2007 was $35.60 (1997 dollars) per hour, which represented 98.8 per cent of the Canadian level, up slightly from 98.3 per cent in 1997. The province had the fourth highest labour productivity level among the ten provinces in 2007, after Newfoundland and Labrador, Alberta, and Ontario.

Quebec had labour productivity gaps relative to Canada in nine of the 15 two-digit NAICS industries. The largest gap was in mining, oil and gas extraction, where labour productivity was below the national rate by 39.7 per cent in 2007. In contrast, labour productivity in utilities was 21.3 per cent above the national level.

Quebec's multifactor productivity in the market sector grew at an average rate of 0.9 per cent per year during the 1997-2007 period, well above the national average of 0.4 per cent per year. The province ranked third in Canada, behind Newfoundland and Nova Scotia.

Ontario: High Productivity Levels but Average Productivity Growth

Ontario's labour productivity growth in the market sector was the same as the national average during the 1997-2007 period, 1.7 per cent per year. This is not surprising given the size of Ontario's economy relative to Canada's. In 2007, Ontario accounted for 37.8 per cent of Canada's nominal GDP, and 40.0 per cent of total hours worked in Canada in 2007. Ontario's performance ranked seventh among the provinces in terms of labour productivity growth.

In contrast to Canada, where labour productivity growth was driven mainly by increases in capital intensity, in Ontario the main driver was multifactor productivity growth, which was responsible for 48.1 per cent of total growth. Capital intensity growth accounted for 32.3 per cent of labour productivity growth, while labour quality accounted for 18.8 per cent.

Ontario's labour productivity level in 2007 was $37.32 (1997 dollars) per hour, which represented 103.5 per cent of the Canadian level. This, in turn, implies a positive labour productivity differential of 3.5 percentage points. This positive differential was caused by an above average multifactor productivity level, which was able to offset the below average capital intensity level in its market sector.

Ontario had labour productivity gaps in eight of the 15 two-digit NAICS industries. In most cases, the gaps were caused by below average capital intensity levels. The exceptions were construction, FIRE, and information and cultural industries, all of which had labour productivity gaps caused by below average multifactor productivity levels.

Ontario's multifactor productivity grew at an average rate of 0.8 per cent per year during the 1997-2007 period, twice the national average of 0.4 per cent per year. The province ranked fouth in Canada in terms of multifactor productivity.

Manitoba: Convergence Toward the National Level

Manitoba's labour productivity growth in the market sector was above the national average during the 1997-2007 period, with an average growth rate of 2.1 per cent compared to the Canadian rate of 1.7 per cent per year. In terms of labour productivity growth, Manitoba's performance ranked second among the provinces. Consistent with developments at the national level, labour productivity growth was driven mainly by capital intensity growth. Capital intensity was responsible for 52.9 per cent of growth in labour productivity in Manitoba over the 1997-2007 period.

Manitoba's labour productivity level in 2007 was $31.40 (1997 dollars) per hour, which repre-

sented 87.1 per cent of the Canadian level. This implies a labour productivity gap of 12.9 percentage points, which was caused by below average levels of both multifactor productivity and capital intensity.

Manitoba had a labour productivity gap in 10 of the 15 two-digit NAICS industries. In most cases, a below average multifactor productivity level was the main culprit.

Manitoba's multifactor productivity grew at an average rate of 0.6 per cent per year during the 1997-2007 period, above the national average of 0.4 per cent per year. The province ranked fifth in Canada in terms of multifactor productivity.

Over the 1997-2007 period, Manitoba experienced above average growth in every metric – labour productivity, multifactor productivity, capital intensity, and labour quality.

Saskatchewan: Capital Intensity Growth Drives Strong Labour Productivity Performance

Saskatchewan's labour productivity grew at an average annual rate of 2.1 per cent during the 1997-2007 period, above the national average of 1.7 per cent per year. In terms of labour productivity growth, Saskatchewan's performance ranked third among the provinces. Saskatchewan's FIRE, and transportation and warehousing industries enjoyed the highest labour productivity growth rates in Canada when compared to equivalent industries in the other provinces (3.9 and 2.3 per cent per year, respectively).

Labour productivity growth in both Saskatchewan and Canada was driven mainly by increases in capital intensity. However, capital intensity growth played an even bigger role in Saskatchewan than it played in Canada, explaining 76.2 per cent of total labour productivity growth (while in Canada it accounted for only 56.1 per cent).

Saskatchewan's labour productivity level was $35.40 (1997 dollars) per hour in 1997, which represented 98.1 per cent of the Canadian level. This, in turn, implies a labour productivity gap of 1.9 percentage points, which was caused by a below average multifactor productivity level.

The province had labour productivity gaps in 10 of the 15 two-digit NAICS industries. In most cases, the below average multifactor productivity levels were responsible for the labour productivity gaps. The exceptions were the retail trade, and FIRE industries, where the below average capital intensity levels were responsible for the gaps.

Saskatchewan's labour quality grew at an average rate of 0.9 per cent per year during the 1997-2007 period, significantly higher than the national average, which grew at an average annual rate of 0.5 per cent. The province ranked first in Canada in terms of labour quality growth.

The province's multifactor productivity grew at an average rate of 0.1 per cent per year during the 1997-2007 period, considerably slower than the national average, which grew at an average annual rate of 0.4 per cent. The province ranked eighth in Canada in terms of multifactor productivity growth.

Alberta: Falling Productivity in Mining and Oil and Gas Extraction Severely Dampen Labour Productivity Growth

Alberta's labour productivity grew at an average annual rate of 1.0 per cent during the 1997-2007 period, well below the national average of 1.7 per cent per year. In terms of labour productivity growth, Alberta's performance ranked tenth among the provinces due to poor performance in its largest sector, mining, and oil and gas extraction. However, Alberta ranked first using the equally weighted rankings due to

strong productivity growth in most industries. Two industries in Alberta enjoyed the highest labour productivity growth rates in Canada when compared to equivalent industries in the other provinces: retail trade (4.9 per cent per year), and information and cultural industries (5.3 per cent).

Labour productivity growth in both Alberta and Canada was driven mainly by increases in capital intensity. However, capital intensity growth played a much larger role in Alberta, where it amounted to over 100 per cent of growth as multifactor productivity experienced a decline. Indeed capital intensity growth in Alberta was the fastest among the ten provinces.

Alberta's labour productivity level was $39.4 (1997 dollars) per hour in 1997, which represented 109.3 per cent of the Canadian level. This, in turn, implies a positive labour productivity differential of 9.3 percentage points, which was caused by an above average capital intensity level.

Alberta had labour productivity levels below the national average in only 3 of the 15 two-digit NAICS industries: mining, and oil and gas extraction, wholesale trade, and arts, entertainment and recreation. In every case, below average multifactor productivity levels were the main cause.

Alberta's multifactor productivity declined at an average rate of 1.6 per cent per year during the 1997-2007 period, well below the national average of 0.4 per cent, and the lowest growth rate experienced by any province.

British Columbia: Manufacturing Shines Despite an Overall Sub-par Performance

British Columbia experienced weak labour productivity growth in the market sector from 1997 to 2007, with an average growth rate of only 1.2 per cent per year, significantly below the national average of 1.7 per cent per year. This was due to weak capital intensity growth compared to the national average (1.6 per cent vs. 2.3 per cent), as well as weak labour quality growth (0.1 per cent vs. 0.5 per cent). In terms of labour productivity growth, British Columbia's performance ranked ninth among the provinces, only above Alberta.

Labour productivity growth in the province was driven mainly by capital intensity growth, which accounted for 52.2 per cent of the increase observed over the 1997-2007 period. Multifactor productivity growth also played an important role, accounting for 40.6 per cent of labour productivity growth. Finally, a small increase in labour quality was responsible for 6.5 per cent of the labour productivity growth experienced in the province.

In spite of overall low labour productivity growth, the manufacturing and utilities industries in British Columbia had the highest growth rates compared to equivalent industries in the other provinces over the 1997-2007 period (2.9 and 2.1 per cent per year, respectively).

British Columbia's labour productivity level in 2007 was $32.50 (1997 dollars) per hour, which represented 90.1 per cent of the Canadian level, down from 95.0 per cent in 1997. The province had the sixth highest labour productivity level among the ten provinces in 2007. British Columbia had labour productivity gaps relative to Canada in eight of the 15 two-digit NAICS industries. In most cases, the below average capital intensity level was the main culprit.

Multifactor productivity in British Columbia's market sector grew at an average rate of 0.5 per cent per year during the 1997-2007 period, slightly above the national average of 0.4 per cent per year. The province ranked sixth .

Conclusion

This article, based on the CSLS Provincial Productivity Database, provided a detailed por-

trait of the productivity performance of the ten Canadian provinces over the 1997-2007 period at the market sector level and at the two-digit NAICS industry level. It uses the standard growth accounting methodology to decompose labour productivity growth into changes in labour composition, capital intensity, and multifactor productivity.

Of the three sources of labour productivity growth, labour composition was found to be the least important source at the national level (18 per cent) and in all provinces, with contributions ranging from 0.08 per cent per year to 0.37 per cent. On the other hand, capital intensity was found to be by far the most important source at the national level (57 per cent), as well as in most provinces. The contribution of multifactor productivity was between that of labour composition and capital intensity, although there was a wide range across provinces from 4.15 percentage points in Newfoundland and Labrador to -1.58 points in Alberta.

A key finding of the article is that the large variation in labour productivity growth rates and levels across provinces reflects important differences not only in the industry mix, but also in the actual production processes employed within a given industry/sector. An interesting example can be seen in the provinces that had the highest and lowest labour productivity growth rates in Canada during the 1997-2007 period: Newfoundland and Labrador (4.8 per cent per year), and Alberta (1.0 per cent). Both results were driven by the mining and oil and gas extraction sector. However, in Newfoundland and Labrador labour productivity in the sector grew at an astounding average annual rate of 15.3 per cent, while in Alberta it declined by 4.3 per cent per year. These divergent trends reflect the very different nature of this industry in the two provinces. In Newfoundland and Labrador, the mining and oil and gas extraction sector represented less than 9 per cent of the province's GDP in 1997, but it grew rapidly over the period as production from the offshore oil wells took off.

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Table 1

Industry Share of Nominal GDP in Canada and the Provinces, 2007

(per cent of market sector)

Market Sector	Canada	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Agriculture, Forestry, Fishing and Hunting	2.1	1.8	10.9	3.3	3.5	2.3	1.1	5.0	7.4	1.7	3.2
Mining, and Oil and Gas Extraction	11.1	59.7	0.0	6.9	5.3	1.4	1.8	7.2	31.7	34.0	7.2
Utilities	3.0	2.9	1.2	3.4	5.2	5.5	2.2	4.8	2.6	1.9	2.5
Construction	9.0	4.4	11.0	9.4	10.4	7.9	8.0	6.8	8.1	11.9	10.4
Manufacturing	16.8	5.0	16.2	13.2	18.6	22.8	20.8	18.9	8.1	8.7	12.1
Wholesale Trade	7.1	2.8	5.1	7.0	7.1	7.4	8.5	8.0	7.4	5.0	6.2
Retail Trade	7.4	5.1	11.7	11.1	9.7	8.5	7.4	8.6	6.1	5.2	8.5
Transportation and Warehousing	5.6	2.8	4.8	5.6	6.4	5.3	5.0	8.0	6.5	5.4	7.5
Information and Cultural Industries	4.3	2.2	5.0	5.3	4.1	4.6	5.1	4.4	2.6	2.8	4.8
FIRE*	14.6	4.6	12.4	14.2	11.6	13.6	18.8	12.9	8.8	8.9	15.9
Professional, Scientific and Technical Services	6.2	2.4	3.8	4.9	4.2	5.9	7.6	3.8	2.5	5.4	6.6
ASWMR**	3.3	1.1	3.3	3.4	3.6	3.7	4.1	2.4	1.3	2.2	3.1
Arts, Entertainment and Recreation	0.9	0.2	1.3	0.8	0.7	1.1	1.0	0.8	0.6	0.5	1.2
Accommodation and Food Services	2.8	1.6	5.1	3.7	3.2	3.1	2.7	2.8	2.2	2.3	4.0
Other Services (Except Public Administration)	5.8	3.4	8.3	7.8	6.7	6.8	6.0	5.6	3.9	4.0	6.8

* Finance, Insurance, Real Estate and Renting and Leasing.** Administrative and Support, Waste and Remediation.

Table 2

Industry Share of Total Hours Worked in Canada and the Provinces, 2007

(per cent of market sector)

Market Sector	Canada	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Agriculture, Forestry, Fishing and Hunting	3.4	3.0	11.2	4.8	4.6	2.8	2.2	8.7	14.7	3.5	3.8
Mining, and Oil and Gas Extraction	2.0	5.3	0.1	1.0	1.5	0.5	0.5	1.1	5.9	8.5	1.3
Utilities	0.8	1.7	0.3	0.7	1.4	1.0	0.7	1.3	0.8	0.5	0.4
Construction	10.1	8.4	10.2	10.4	11.0	6.9	8.8	8.3	10.2	18.0	11.6
Manufacturing	14.8	11.8	15.8	12.8	15.0	19.2	16.6	16.4	7.9	8.4	10.8
Wholesale Trade	6.9	5.0	5.0	5.9	4.9	7.1	7.6	6.0	5.9	6.3	6.4
Retail Trade	12.9	19.3	15.3	16.5	14.8	14.2	12.0	12.9	13.5	11.2	13.3
Transportation and Warehousing	6.6	7.8	5.5	6.9	8.7	6.2	5.8	9.5	8.5	7.0	7.6
Information and Cultural Industries	2.7	3.0	1.5	2.5	2.2	2.8	3.2	2.2	2.2	1.7	2.5
FIRE*	7.8	4.7	4.7	6.8	5.1	7.2	9.5	6.5	6.0	5.9	7.4
Professional, Scientific and Technical Services	7.9	5.8	3.6	6.2	5.0	7.3	8.9	5.4	4.1	8.1	8.1
ASWMR** 5.7	4.3	5.4	5.5	6.8	5.4	6.6	4.2	3.1	4.3	5.6	
Arts, Entertainment and Recreation	1.9	1.1	2.3	2.0	1.5	1.8	1.8	1.6	1.7	1.6	2.5
Accommodation and Food Services	7.0	8.2	9.5	8.0	7.5	7.3	6.4	7.1	7.4	6.1	8.7
Other Services (Except Public Administration)	9.5	10.6	9.4	10.0	10.1	10.1	9.3	8.8	8.1	8.8	9.9

Table 3

Labour Productivity Growth in Canada and the Provinces at the Two-Digit Industry Level, 1997-2007

(compound annual growth rates)

Market Sector	Canada	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.
	1.7	4.8	1.6	1.9	1.8	1.8	1.7	2.1	2.1	1.0	1.2
Agriculture, Forestry, Fishing and Hunting	4.2	8.9	3.0	3.3	7.6	3.8	3.0	4.9	4.7	7.3	1.7
Mining, and Oil and Gas Extraction	-2.2	15.3	-8.8	8.1	-4.8	0.1	-4.1	6.1	-4.7	-4.3	0.5
Utilities	-0.9	-0.7	-4.7	-0.1	-1.1	-1.5	-0.9	-2.7	0.7	-1.4	2.1
Construction	1.7	-1.4	2.8	1.5	3.5	2.2	1.7	2.1	1.0	3.0	-0.7
Manufacturing	2.2	-0.7	0.2	1.8	0.9	2.4	2.4	0.9	0.1	2.2	2.9
Wholesale Trade	3.7	4.0	-3.5	1.7	4.5	3.4	4.2	3.2	3.9	2.7	4.0
Retail Trade	3.3	3.2	3.8	3.7	3.8	2.9	3.1	4.3	4.0	4.9	2.9
Transportation and Warehousing	0.7	-0.5	-1.2	0.9	0.2	0.4	0.2	0.4	2.3	1.3	1.0
Information and Cultural Industries	3.0	4.1	4.8	5.0	4.4	1.3	2.7	3.3	4.1	5.3	4.2
FIRE*	1.5	2.0	1.4	1.0	2.2	1.1	1.5	2.0	3.9	2.0	1.1
Professional, Scientific and Technical Services	1.3	-0.9	2.4	-0.9	0.9	1.4	1.5	-0.8	2.0	1.8	0.5
ASWMR**	0.3	-2.2	-2.2	1.6	-1.1	1.1	0.6	2.0	1.7	0.8	-2.5
Arts, Entertainment and Recreation	-1.2	-5.1	-4.2	-6.0	-5.5	-0.4	-0.2	5.7	-3.8	-2.2	-3.9
Accommodation and Food Services	1.1	1.4	2.6	1.8	0.7	1.7	0.5	0.4	0.9	2.4	0.5
Other Services (Except Public Administration)	2.1	0.7	4.6	3.3	1.8	3.3	1.5	2.8	3.7	1.9	1.3

* Finance, Insurance, Real Estate and Renting and Leasing. ** Administrative and Support, Waste and Remediation.

Table 4

Labour Productivity Growth in Canada and the Provinces at the Two-Digit Industry Level, Provincial Ranking, 1997-2007

Market Sector	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.
	1	8	4	5	6	7	2	3	10	9
Agriculture, Forestry, Fishing and Hunting	1	9	7	2	6	8	4	5	3	10
Mining, and Oil and Gas Extraction	1	10	2	9	5	6	3	8	7	4
Utilities	4	10	3	6	8	5	9	2	7	1
Construction	10	3	7	1	4	6	5	8	2	9
Manufacturing	10	8	5	6	3	2	7	9	4	1
Wholesale Trade	4	10	9	1	6	2	7	5	8	3
Retail Trade	7	4	6	5	9	8	2	3	1	10
Transportation and Warehousing	9	10	4	8	5	7	6	1	2	3
Information and Cultural Industries	7	3	2	4	10	9	8	6	1	5
FIRE*	5	7	10	2	8	6	3	1	4	9
Professional, Scientific and Technical Services	10	1	9	6	5	4	8	2	3	7
ASWMR**	9	8	3	7	4	6	1	2	5	10
Arts, Entertainment and Recreation	8	7	10	9	3	2	1	5	4	6
Accommodation and Food Services	5	1	3	7	4	9	10	6	2	8
Other Services (Except Public Administration)	10	1	3	7	4	8	5	2	6	9
Absolute Equally Weighted Average Rank	6.7	6.1	5.5	5.3	5.6	5.9	5.3	4.3	3.9	6.3
Equally Weighted Market Sector Rank	10	8	5	4	6	7	3	2	1	9

Table 5

Labour Productivity Level in Canada and the Provinces at the Two-Digit Industry Level, 2007
(1997 Dollars)

Market Sector	Canada	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.
	36.1	39.6	22.1	27.1	28.2	35.6	37.3	31.4	35.4	39.4	32.5
Agriculture, Forestry, Fishing and Hunting	27.1	50.9	19.9	22.6	36.9	29.2	20.2	22.1	23.5	29.7	38.8
Mining, and Oil and Gas Extraction	78.7	233.6	n.a.	90.0	28.1	47.5	48.2	100.5	94.6	75.2	90.9
Utilities	134.6	99.3	64.6	111.3	86.2	163.3	110.3	102.2	176.1	182.8	217.9
Construction	31.9	23.4	18.3	25.7	27.6	38.6	30.5	27.8	29.4	39.8	23.8
Manufacturing	47.8	25.3	25.4	30.1	36.4	46.4	50.8	33.6	41.6	57.1	46.2
Wholesale Trade	41.9	39.2	18.3	30.3	34.9	37.7	46.5	40.1	48.6	38.8	39.4
Retail Trade	22.0	15.5	18.3	17.3	18.2	21.4	22.6	23.5	20.2	25.5	21.6
Transportation and Warehousing	31.8	22.2	17.9	23.2	23.2	29.8	31.1	29.6	38.1	36.4	34.7
Information and Cultural Industries	68.6	74.2	94.6	70.6	73.7	63.8	66.8	70.6	59.7	87.6	69.6
FIRE*	70.3	65.9	70.2	65.8	68.0	68.1	71.9	69.0	66.9	75.7	65.5
Professional, Scientific and Technical Services	27.0	20.2	21.4	20.2	21.9	26.3	29.1	18.3	22.4	28.6	23.4
ASWMR**	19.8	13.0	11.2	16.8	12.7	21.2	20.9	18.7	18.0	21.9	15.3
Arts, Entertainment and Recreation	16.2	13.2	9.9	8.9	10.0	18.9	18.9	16.8	14.1	12.8	12.0
Accommodation and Food Services	13.8	11.4	13.0	12.3	11.0	13.3	13.2	12.7	12.6	16.6	14.8
Other Services (Except Public Administration)	16.3	11.0	13.6	13.1	12.4	17.2	16.1	16.4	18.5	16.4	16.4

* Finance, Insurance, Real Estate and Renting and Leasing. ** Administrative and Support, Waste and Remediation.

Table 6

Relative Labour Productivity Levels by Province at the Two-Digit Industry Level, 2007

(Canada=100.0)

Market Sector	Canada	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.
	100.0	109.7	61.3	75.1	78.1	98.8	103.5	87.1	98.1	109.3	90.1
Agriculture, Forestry, Fishing and Hunting	100.0	187.5	73.1	83.3	136.1	107.4	74.5	81.2	86.4	109.4	143.0
Mining, and Oil and Gas Extraction	100.0	296.9	10.7	114.4	35.7	60.3	61.3	127.8	120.2	95.5	115.5
Utilities	100.0	73.8	48.0	82.7	64.0	121.3	81.9	75.9	130.8	135.8	161.9
Construction	100.0	73.4	57.5	80.5	86.4	121.1	95.8	87.2	92.1	124.8	74.7
Manufacturing	100.0	52.9	53.1	63.0	76.1	97.1	106.3	70.3	86.9	119.4	96.7
Wholesale Trade	100.0	93.5	43.7	72.2	83.4	90.0	110.9	95.6	115.8	92.6	94.1
Retail Trade	100.0	70.5	82.9	78.5	82.5	97.2	102.7	106.5	91.5	115.6	98.1
Transportation and Warehousing	100.0	69.8	56.3	73.0	73.2	93.8	97.8	93.0	119.8	114.7	109.3
Information and Cultural Industries	100.0	108.1	137.9	102.9	107.5	92.9	97.3	102.9	87.1	127.7	101.4
FIRE*	100.0	93.7	99.8	93.6	96.7	96.8	102.2	98.1	95.2	107.7	93.1
Professional, Scientific and Technical Services	100.0	74.9	79.3	74.8	81.3	97.4	107.9	67.8	83.1	106.1	86.6
ASWMR**	100.0	65.5	56.7	84.8	64.3	106.9	105.6	94.2	90.9	110.8	77.1
Arts, Entertainment and Recreation	100.0	81.4	61.2	55.2	61.9	116.9	116.7	103.6	87.4	79.1	74.4
Accommodation and Food Services	100.0	83.0	94.5	89.4	80.0	96.9	96.2	92.4	91.8	120.3	107.4
Other Services (Except Public Administration)	100.0	67.9	83.8	80.5	76.2	106.0	98.8	101.0	113.6	100.8	100.8

Table 7

Relative Labour Productivity Levels by Province at the Two-Digit Industry Level, Provincial Ranking, 2007

Market Sector	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.
	1	10	9	8	4	3	7	5	2	6
Agriculture, Forestry, Fishing and Hunting	1	10	7	3	5	9	8	6	4	2
Mining, and Oil and Gas Extraction	1	10	5	9	8	7	2	3	6	4
Utilities	8	10	5	9	4	6	7	3	2	1
Construction	9	10	7	6	2	3	5	4	1	8
Manufacturing	10	9	8	6	3	2	7	5	1	4
Wholesale Trade	5	10	9	8	7	2	3	1	6	4
Retail Trade	10	7	9	8	5	3	2	6	1	4
Transportation and Warehousing	9	10	8	7	5	4	6	1	2	3
Information and Cultural Industries	3	1	5	4	9	8	6	10	2	7
FIRE*	8	3	9	6	5	2	4	7	1	10
Professional, Scientific and Technical Services	8	7	9	6	3	1	10	5	2	4
ASWMR**	8	10	6	9	2	3	4	5	1	7
Arts, Entertainment and Recreation	5	9	10	8	1	2	3	4	6	7
Accommodation and Food Services	9	5	8	10	3	4	6	7	1	2
Other Services (Except Public Administration)	10	7	8	9	2	6	3	1	4	5
Absolute Equally Weighted Average Rank	6.9	7.9	7.5	7.2	4.3	4.1	5.1	4.5	2.7	4.8
Equally Weighted Market Sector Rank	7	10	9	8	3	2	6	4	1	5

*Finance, Insurance, Real Estate and Renting and Leasing. ** Administrative and Support, Waste and Remediation.

Table 8

Multifactor Productivity Growth in Canada and the Provinces at the Two-Digit Industry Level, 1997-2007
(compound annual growth rates)

Market Sector	Canada	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.
	0.4	4.1	-0.2	1.1	0.4	0.9	0.8	0.6	0.1	-1.6	0.5
Agriculture, Forestry, Fishing and Hunting	2.5	4.6	0.5	2.5	5.6	2.9	1.7	3.1	2.4	3.4	1.9
Mining, and Oil and Gas Extraction	-4.8	18.8	-20.5	4.6	-5.0	-0.3	-2.2	3.1	-4.9	-7.4	-2.1
Utilities	-0.3	0.4	-9.9	1.5	-2.3	0.6	0.0	-1.9	0.5	-2.4	0.3
Construction	1.6	-1.1	1.7	1.3	3.1	1.5	0.9	0.9	1.7	4.6	-0.2
Manufacturing	1.8	-0.4	0.9	1.9	-0.1	1.9	1.7	0.0	1.0	1.4	4.0
Wholesale Trade	2.2	2.9	-2.4	0.6	4.0	1.2	2.8	1.5	3.1	0.9	3.3
Retail Trade	2.1	1.7	2.1	2.6	1.6	1.7	1.5	3.1	4.0	4.4	2.0
Transportation and Warehousing	-0.5	-1.9	-1.9	-0.6	-1.3	-0.8	-1.0	0.1	1.9	-0.5	0.4
Information and Cultural Industries	1.5	1.5	4.7	2.4	1.2	1.9	1.1	0.5	1.4	1.6	2.3
FIRE*	0.0	-1.8	-2.1	-0.2	-1.4	-0.6	0.5	-0.4	1.4	0.0	-0.8
Professional, Scientific and Technical Services	-0.7	-3.9	-0.5	-3.1	-1.2	-0.6	-0.5	-2.1	-0.8	-0.6	-0.8
ASWMR**	-0.4	1.2	-2.0	0.7	0.4	1.4	-0.7	0.4	-1.6	-0.9	-2.6
Arts, Entertainment and Recreation	-2.0	-4.6	-1.7	-6.2	-5.8	-0.8	-0.9	2.3	-4.5	-3.7	-5.7
Accommodation and Food Services	0.6	0.8	1.6	0.7	0.0	1.2	0.5	-0.2	0.5	1.5	-0.5
Other Services (Except Public Administration)	1.2	-0.5	3.6	1.7	0.1	1.6	1.0	3.0	4.4	0.5	0.6

Table 9

Multifactor Productivity Growth in Canada and the Provinces at the Two-Digit Industry Level, Provincial Ranking, 1997-2007

Market Sector	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.
	1	9	2	7	3	4	5	8	10	6
Agriculture, Forestry, Fishing and Hunting	2	10	6	1	5	9	4	7	3	8
Mining, and Oil and Gas Extraction	1	10	2	8	4	6	3	7	9	5
Utilities	4	10	1	8	2	6	7	3	9	5
Construction	10	3	6	2	5	7	7	3	1	9
Manufacturing	10	7	2	9	2	4	8	6	5	1
Wholesale Trade	4	10	9	1	7	5	6	3	8	2
Retail Trade	7	5	4	9	7	10	3	2	1	6
Transportation and Warehousing	9	9	5	8	6	7	3	1	4	2
Information and Cultural Industries	6	1	2	8	4	9	10	7	5	3
FIRE*	9	10	4	8	6	2	5	1	3	7
Professional, Scientific and Technical Services	10	1	9	7	3	1	8	5	3	6
ASWMR**	2	9	3	4	1	6	4	8	7	10
Arts, Entertainment and Recreation	7	4	10	9	2	3	1	6	5	8
Accommodation and Food Services	4	1	5	8	3	6	9	6	2	10
Other Services (Except Public Administration)	10	2	4	9	5	6	3	1	8	7
Absolute Equally Weighted Average Rank	6.3	6.1	4.8	6.6	4.1	5.8	5.4	4.4	4.9	5.9
Equally Weighted Market Sector Rank	9	8	3	10	1	6	5	2	4	7

*Finance, Insurance, Real Estate and Renting and Leasing. ** Administrative and Support, Waste and Remediation.

Table 10

Relative Multifactor Productivity Levels by Province at the Two-Digit Industry Level, 2007

(Canada=100.0)

Market Sector	Canada	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.
	100.0	135.4	74.1	93.4	88.5	103.3	108.6	91.9	82.1	81.6	102.5
Agriculture, Forestry, Fishing and Hunting	100.0	165.6	79.9	102.8	158.9	108.6	90.2	90.3	76.3	94.3	137.6
Mining, and Oil and Gas Extraction	100.0	1453.3	13.3	233.2	97.8	194.2	147.6	248.5	95.0	73.7	140.2
Utilities	100.0	103.0	35.1	116.9	75.2	110.4	102.4	82.7	107.8	80.5	106.2
Construction	100.0	68.0	64.2	91.1	92.6	103.8	92.8	82.0	86.1	146.4	83.3
Manufacturing	100.0	64.1	74.6	88.5	77.1	96.0	103.0	74.3	88.7	97.5	125.5
Wholesale Trade	100.0	93.5	59.6	77.5	102.1	87.5	109.5	86.7	100.7	89.2	111.1
Retail Trade	100.0	74.5	83.6	89.0	83.7	93.4	99.1	113.0	108.5	123.0	103.4
Transportation and Warehousing	100.0	72.9	83.5	80.5	80.7	96.0	97.8	103.8	109.3	99.0	116.4
Information and Cultural Industries	100.0	95.8	130.9	101.6	98.3	104.7	96.9	91.8	93.8	102.3	108.2
FIRE*	100.0	75.4	76.5	92.4	80.1	93.4	107.2	92.4	101.5	102.7	90.7
Professional, Scientific and Technical Services	100.0	66.4	78.1	73.4	85.7	98.2	106.9	76.6	81.6	104.4	94.4
ASWMR**	100.0	105.4	62.7	94.9	89.9	127.5	99.1	89.6	78.1	98.3	76.2
Arts, Entertainment and Recreation	100.0	76.3	87.4	55.9	67.5	118.6	116.5	106.2	72.2	74.7	68.0
Accommodation and Food Services	100.0	87.6	91.9	87.7	83.6	100.7	100.9	94.3	89.5	107.2	102.1
Other Services (Except Public Administration)	100.0	68.8	97.0	79.4	74.7	96.9	108.1	110.4	119.6	93.6	102.1

Table 11

Relative Multifactor Productivity Levels by Province at the Two-Digit Industry Level, Provincial Ranking, 2007

Market Sector	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.
	1	10	5	7	3	2	6	8	9	4
Agriculture, Forestry, Fishing and Hunting	1	9	5	2	4	8	7	10	6	3
Mining, and Oil and Gas Extraction	1	10	3	7	4	5	2	8	9	6
Utilities	5	10	1	9	2	6	7	3	8	4
Construction	9	10	5	4	2	3	8	6	1	7
Manufacturing	10	8	6	7	4	2	9	5	3	1
Wholesale Trade	5	10	9	3	7	2	8	4	6	1
Retail Trade	10	9	7	8	6	5	2	3	1	4
Transportation and Warehousing	10	7	9	8	6	5	3	2	4	1
Information and Cultural Industries	8	1	5	6	3	7	10	9	4	2
FIRE*	10	9	6	8	4	1	5	3	2	7
Professional, Scientific and Technical Services	10	7	9	5	3	1	8	6	2	4
ASWMR**	2	10	5	6	1	3	7	8	4	9
Arts, Entertainment and Recreation	5	4	10	9	1	2	3	7	6	8
Accommodation and Food Services	9	6	8	10	4	3	5	7	1	2
Other Services (Except Public Administration)	10	5	8	9	6	3	2	1	7	4
Absolute Equally Weighted Average Rank	7.0	7.7	6.4	6.7	3.8	3.7	5.7	5.5	4.3	4.2
Equally Weighted Market Sector Rank	9	10	7	8	2	1	6	5	4	3

*Finance, Insurance, Real Estate and Renting and Leasing. ** Administrative and Support, Waste and Remediation.

Table 12

Sources of Labour Productivity Growth in Canada and the Provinces, Market Sector, 1997-2007

	Canada	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.
	Compound Annual Growth Rate										
Output	3.61	6.68	2.95	3.22	3.08	3.33	3.71	2.86	1.98	4.06	3.29
Total Hours	1.87	1.78	1.34	1.28	1.28	1.54	1.97	0.75	-0.10	2.99	2.08
Labour Composition	0.52	0.60	0.59	0.24	0.44	0.46	0.52	0.61	0.90	0.49	0.12
Capital Services	4.21	2.34	4.92	2.95	4.12	2.88	3.46	3.42	2.62	7.72	3.76
Capital Stock	2.97	1.44	2.52	2.43	3.37	1.68	2.36	2.01	0.63	6.35	2.76
Capital Composition	1.20	0.89	2.34	0.51	0.73	1.18	1.07	1.38	1.98	1.29	0.97
Capital Services Intensity	2.30	0.55	3.53	1.65	2.81	1.32	1.46	2.65	2.73	4.59	1.64
	Labour and Capital Compensation as a Share of GDP										
Labour Share	57.89	44.31	59.64	60.30	59.48	58.42	61.73	57.23	41.27	46.70	62.14
Capital Share	42.22	70.42	40.20	38.84	40.37	41.06	38.02	42.15	58.62	52.89	37.68
	Percentage Point Contributions to Labour Productivity Growth										
Labour Productivity (Output per Hour)	1.71	4.82	1.59	1.92	1.78	1.76	1.71	2.10	2.09	1.04	1.18
Labour Composition	0.30	0.27	0.35	0.15	0.26	0.27	0.32	0.35	0.37	0.23	0.08
Capital Services Intensity	0.97	0.39	1.42	0.64	1.13	0.54	0.56	1.12	1.60	2.43	0.62
Capital Stock Intensity	0.68	0.24	0.73	0.53	0.93	0.32	0.38	0.66	0.39	2.00	0.45
Capital Composition Intensity	0.28	0.15	0.67	0.11	0.20	0.22	0.17	0.45	1.21	0.41	0.16
Multifactor Productivity	0.44	4.14	-0.18	1.12	0.37	0.94	0.82	0.62	0.11	-1.58	0.48
	Per Cent Contributions to Labour Productivity Growth										
Labour Productivity	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Labour Quality	17.5	5.5	22.0	7.6	14.8	15.1	18.8	16.6	17.8	22.1	6.5
Capital Services Intensity	56.6	8.0	89.2	33.5	63.7	30.7	32.5	53.4	76.5	233.9	52.6
Capital Stock Intensity	39.9	4.9	45.8	27.6	52.1	18.0	22.2	31.3	18.5	192.4	38.6
Capital Composition Intensity	16.2	3.0	42.4	5.7	11.3	12.6	10.1	21.6	57.7	39.1	13.6
Multifactor Productivity	25.5	85.9	-11.3	58.4	20.9	53.6	48.1	29.4	5.3	-152.5	40.6

Table 13

Sources of the Labour Productivity Gap Relative to Canada by Province, Market Sector, 1997-2007

	Labour Productivity Relative Level	Labour Productivity Gap	Percentage Point Contributions to the Labour Productivity Gap			Per Cent Contributions to the Labour Productivity Gap			
			Capital Intensity	Multifactor Productivity	Labour Quality	Labour Productivity	Capital Intensity	Multifactor Productivity	Labour Quality
Canada	100.0	0.0							
Nfld.	109.7	9.7	-22.4	31.8	0.4	100.0	-230.3	326.4	3.9
P.E.I.	61.3	-38.7	-15.3	-23.7	0.3	100.0	39.5	61.3	-0.8
N.S.	75.1	-24.9	-17.7	-5.9	-1.4	100.0	70.9	23.6	5.5
N.B.	78.1	-21.9	-10.7	-10.9	-0.4	100.0	48.8	49.5	1.7
Que.	98.8	-1.2	-4.1	3.2	-0.4	100.0	342.7	-273.3	30.6
Ont.	103.5	3.5	-4.9	8.4	0.0	100.0	-142.0	241.4	0.6
Man.	87.1	-12.9	-5.4	-7.9	0.5	100.0	42.2	61.4	-3.6
Sask.	98.1	-1.9	15.9	-19.6	1.8	100.0	-844.5	1,037.4	-93.0
Alta.	109.3	9.3	30.7	-21.2	-0.1	100.0	329.4	-227.8	-1.6
B.C.	90.1	-9.9	-10.1	2.3	-2.2	100.0	101.5	-23.4	21.9