Insights into Canada's Abysmal Post-2000 Productivity Performance from Decompositions of Labour Productivity Growth by Industry and Province

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ABSTRACT

The Centre for the Study of Living Standards has released new estimates of labour, capital and multifactor productivity growth and levels at the market sector, two-digit, and three-digit NAICS industry level for the Canadian provinces during the 1997-2007 period. This article exploits this database to shed light on the nature of the slowdown in labour productivity growth in Canada after 2000. It identifies manufacturing as the sector that has accounted for most of the slowdown. Within manufacturing, transportation equipment and computers and electronics are found to be the industries that accounted for the lion's share of the sector's fall-off in labour productivity growth. Ontario was the province that contributed proportionately the most to the slowdown because of the concentration of manufacturing in this province. A fall in manufacturing output growth is identified as the factor most responsible for the decline in productivity growth in the sector.

RÉSUMÉ

Le Centre d'étude des niveaux de vie a publié récemment de nouvelles estimations de la main-d'œuvre, du capital et de la croissance de la productivité multifactorielle et des estimations nivelées pour les provinces canadiennes selon les branches d'activité pour la période de 1997 à 2007 au niveau des industries à deux chiffres et à trois chiffres du secteur du marché du SCIAN. Dans cet article, cette base de données est utilisée pour expliquer partiellement la nature du ralentissement de la croissance de la productivité du travail au Canada après 2000. L'article conclut que la fabrication est le secteur responsable pour la plupart du ralentissement. Dans la fabrication, les branches du matériel de transport, ainsi que de l'information et de l'électronique, sont celles qui sont largement en tête de liste pour la chute de la croissance de la productivité du travail. Ontario était la province qui a contribué proportionnellement le plus au ralentissement de la productivité en raison de la concentration de la fabrication dans cette province. Les auteurs trouvent qu'une chute dans le taux de croissance de la production du secteur de la fabrication est responsable pour le déclin dans le taux de croissance de la productivité du secteur.

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CANADA'S LABOUR PRODUCTIVITY GROWTH has been very slow by historical standards since 2000. Since productivity growth is the main driver of living standards growth in the long run, this development has important implications for Canada's economic future. In order to develop public policy and private sector actions that address Canada's weak productivity performance, one must first understand the nature of the productivity slowdown and the reasons for it. The objective of this article is to develop insights into Canada's abysmal post-2000 productivity performance through the decomposition of labour productivity growth by industry and province.

Two key questions need to be answered to shed light on the nature of the productivity slowdown. First, which sectors and provinces were largely responsible for the slowdown? Second, what is the relative importance of within-sector and within-province productivity developments compared to sectoral reallocations of labour among provinces and industries to aggregate productivity growth and the aggregate productivity slowdown? Sharpe (2010b) found that for the two-digit NAICS industries, manufacturing was responsible for all of the fall in labour productivity growth between the 1973-2000 and 2000-2007 periods and that sectoral reallocations of labour were not a major contributing factor. This article uses a new three-digit NAICS data base for the 1997-2007 period developed by Statistics Canada for the Centre for the Study of Living Standards to decompose labour productivity growth at this more disaggregated level (Sharpe and Thomson, 2010).

The goal of the decomposition is to break down overall labour productivity growth into the components caused by within-sector changes in labour productivity growth and labour reallocation effects. There are two types of reallocation effects to take into consideration. The first is the reallocation level effect. This effect is positive when the labour input share is growing in industries that have above average labour productivity levels or when the labour input share is falling in industries with below average productivity levels. It is negative when labour is moving into industries with below average productivity levels or leaving industries with above average productivity levels. The second is the reallocation growth effect. This effect is positive if the growth rate of labour productivity is above average and the labour input share of the industry is increasing or if the growth rate is below average and the labour share is decreasing. It is negative if the growth rate of labour productivity is above average and the labour input share is decreasing or if the rate of growth is below average and the labour input share is rising.

This article is divided into four sections. The first presents the analytical framework for the decomposition of labour productivity. The second provides the results of the decompositions at the provincial, two-digit industry, and the three-digit industry level. The third section discusses developments in manufacturing, the key sector responsible for slower productivity growth since 2000. The fourth section, summarizes the key results.

Analytical Framework[2]

To begin we note that at any given point in time.

$$P \equiv \frac{Q}{H} = \frac{\Sigma Q_i}{H} = \frac{\Sigma H_i P_i}{H} = \Sigma P_i h_i \qquad (1)$$

where

P = Aggregate labour productivity level
P_i = Labour productivity level in sector i
H = Aggregate hours worked
H_i = Hours worked in sector i
h_i = Share of hours worked in sector i
Q = Aggregate real output
Q_i = Real output of sector i

Equation (1) states that aggregate labour productivity P is equal to the weighted average of

2 This section is based on Sharpe (2010a).

labour productivity in each of the sectors that make up the economy. The weight for each sector is its share of the total number of hours worked in the economy.

Since we are interested in how shifts in hours worked across sectors affect aggregate labour productivity growth, we must move beyond a single point in time. Equation (2) expresses the absolute change in aggregate labour productivity from period 0 to period 1, $\Delta P = P^1 - P^0$ where superscripts denote the period.

$$\Delta P = \Sigma h_i^0 \Delta P_i + \Sigma P_i^0 \Delta h_i + \Sigma \Delta h_i \Delta P_i \qquad (2)$$

In equation (2) h_i^0 and P_i^0 are respectively the share of total hours worked in sector *i* and the level of labour productivity in sector *i* in period 0, expressed in dollars.

In order to obtain economically meaningful sectoral contributions to aggregate productivity growth, we adjust the second term of equation (2) by subtracting the average level of labour productivity $\bar{P}^0$ from the level of labour productivity in each sector in period 0, P_i^0. In the third term, we subtract the average change in labour productivity $\Delta\bar{P}$ from the change in labour productivity in each sector, ΔP_i. The first adjustment ensures that an increase in the share of hours in a sector with a below-average labour productivity level makes a negative contribution to aggregate labour productivity growth.[3] The second adjustment also ensures that an increase in the share of hours in a sector with below-average absolute growth in labour productivity makes a negative contribution to aggregate labour productivity growth. The result of these adjustments is equation (3):

$$\Delta P = \Sigma h_i^0 \Delta P_i + \Sigma (P_i^0 - \bar{P}^0)\Delta h_i + \Sigma \Delta h_i (\Delta P_i - \Delta\bar{P}) \qquad (3)$$

We are able to subtract $\bar{P}^0$ and $\Delta\bar{P}$ from equation (2) because the terms $\Delta\bar{P}\Delta h_i$ and $\bar{P}^0\Delta h_i$ each sum to zero across all sectors, since $\bar{P}^0$ and $\Delta\bar{P}$ are constant and all changes in the share of hours, Δh_i, sum to zero across sectors.

The three terms in equation (3) represent the within-sector, reallocation level and reallocation growth effects, respectively. The within-sector effect captures the change in labour productivity within a sector. The reallocation level effect indicates whether changes in the share of hours have favoured sectors with above- or below-average labour productivity levels. The reallocation growth effect is the sum of the product of the absolute change in the share of hours worked and the absolute change in the labour productivity level for each of the *i* sectors. It measures whether an economy is subject to a phenomenon akin to Baumol's cost disease, *i.e.* the tendency of labour to move towards sectors with relatively small absolute increases in labour productivity. A negative reallocation growth effect at the aggregate level means that labour is moving to sectors with relatively smaller absolute labour productivity increases.

There are some limitations to this analysis. First, the analysis assumes that differences in technological, institutional, and market structures across sectors lead to differences in average levels of labour productivity, even if marginal products are the same. It also assumes that when a sector loses or gains labour, the changes in output per hour are equal to the sector's average output per hour worked. Second, these results are sensitive to the level of disaggregation. For instance, we use 12 sectors at the two-digit level. If within a sector, resources shift from one subsector to another, and these subsectors have different levels of labour productivity, then the measured impact of the reallocation effect on aggregate labour productivity growth would be different.

There is also a small issue with the estimates from the Statistics Canada database used in the decomposition. Real GDP used in the calculation of labour productivity is estimated using a

3 It is this adjustment for the average productivity level that differentiates our decomposition formula from that of Tang and Wang (2004).

chain-weighted index. By definition, the mathematics of the decomposition requires the real GDP estimates across industries to sum to the real GDP estimate at the aggregate level. However, estimates of chain-weighted indices of sub-sectors of real GDP generally do not sum to the chain-weighted estimate of the aggregate measure. However, this difference is generally very small for periods that are close to the base year and should have only a small effect on the decomposition presented in section two (Diewert (1978), Ehemann *et al.* (2002)). Still, because we use the aggregation of the chain-weighted GDP to calculate labour productivity levels, the labour productivity growth rates are somewhat different depending on the level of aggregation.

Results

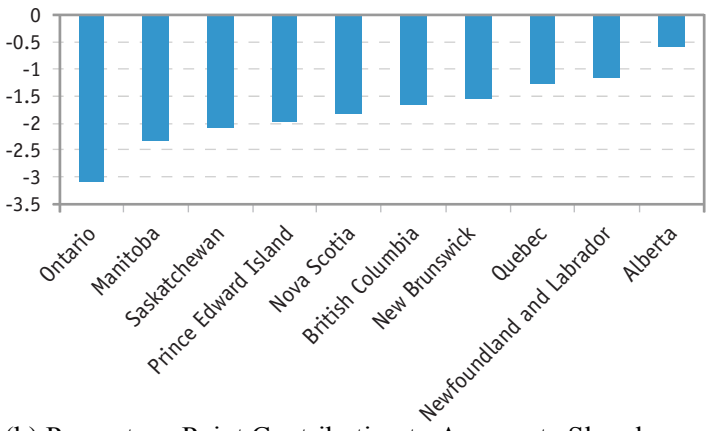
The results section is divided into four parts based on the level of the decomposition. The first decomposes Canada's market sector labour productivity growth by province. The second decomposes Canada's labour productivity by two-digit NAICS industries at the national level. The third decomposes labour productivity at the two-digit level by province. The fourth decomposes Canada's labour productivity by three-digit NAICS industry in the market sector at the national level. All of the tables relating to the results are found at the end of the article.

Market Sector at the Provincial Level

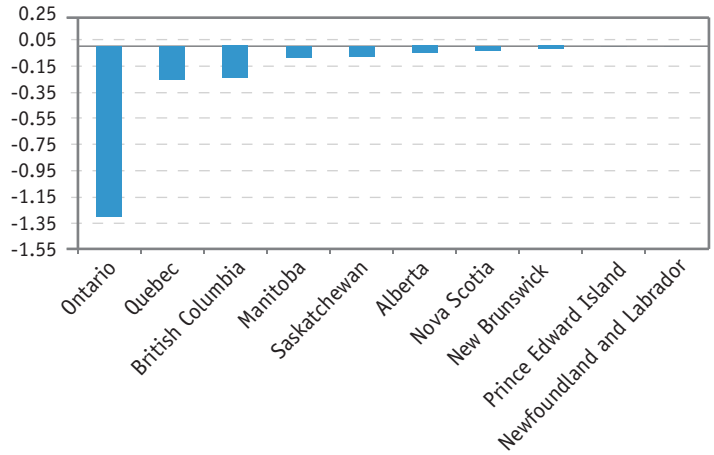
Labour productivity growth slowed in Canada after 2000. From 1997 to 2000, labour productivity growth was robust at 3.18 per cent per year. It fell to a meager 1.09 per cent per year in the 2000-2007 period, a drop of 2.10 percentage points. The slowdown was primarily due to a fall-off in within-province productivity growth, not reallocation effects among provinces. The within-effect contributed -2.06 percentage points to the fall in Can-

Chart 1
Contributions by Province to the Slowdown in Market Sector Labour Productivity Growth Between 1997-2000 and 2000-2007

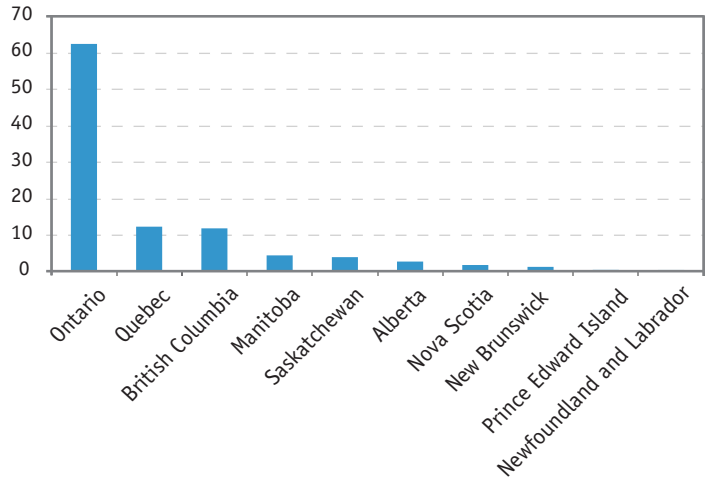
(a) Absolute Change



(b) Percentage Point Contribution to Aggregate Slowdown



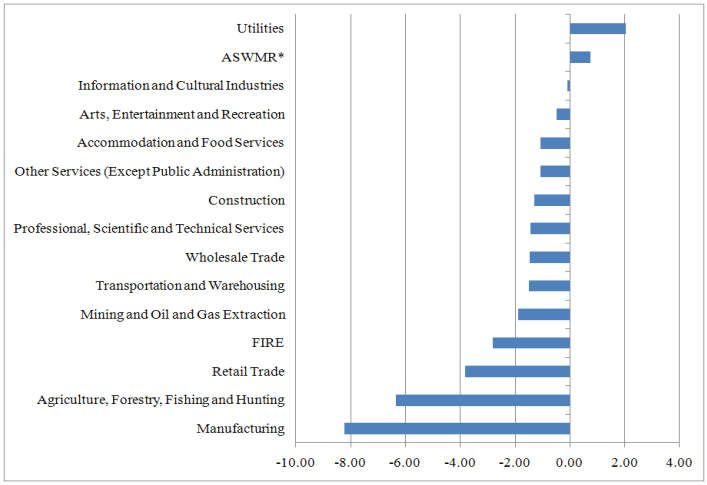
(c) Per Cent Contribution to Aggregate Slowdown



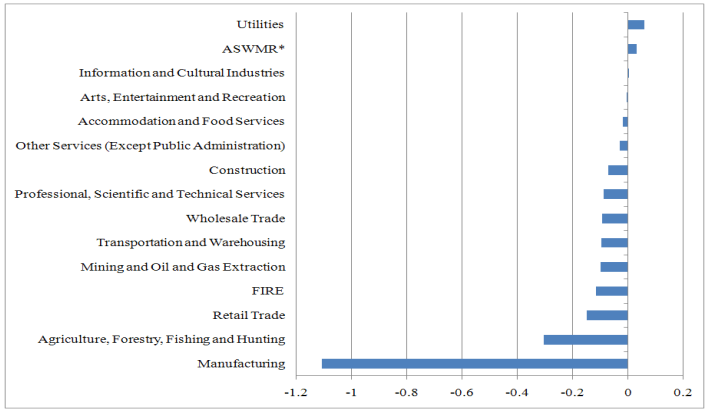
Source: Table 1.

Chart 2
Contributions by Two-Digit NAICS Industries to the Slowdown in Market Sector Labour Productivity Growth Between 1997-2000 and 2000-2007

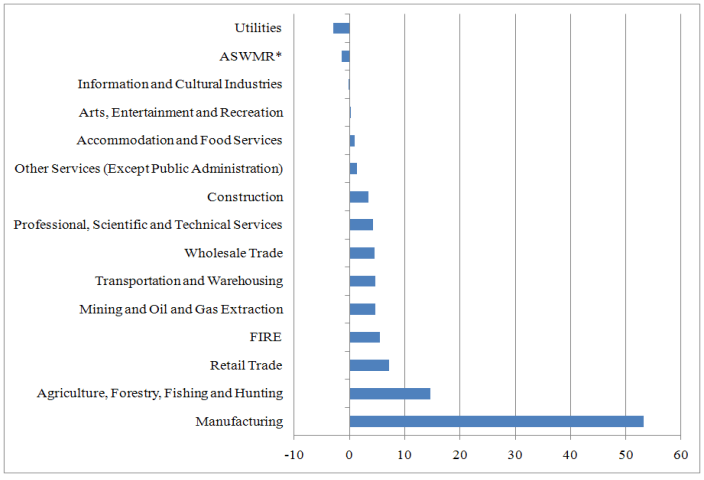
(a) Absolute Percentage Point Change



(b) Percentage Point Contribution to Aggregate Slowdown



(c) Per Cent Contribution to Aggregate Slowdown



Source: Table 1

*Administrative and Support, Waste Management and Remediation Services

ada's labour productivity growth rate (Table 1). Changes in the reallocation of labour across provinces, both reallocation level and growth effects, were relatively small contributors to the change in labour productivity, only -0.02 percentage points each. The very low reallocation effects were due to the relatively limited amount of interprovincial labour mobility. Alberta had the largest change in labour input as its share of Canada's total hours worked increased by 1.4 percentage points from 1997 to 2007. It also had the largest reallocation level effect: 0.03 percentage points between the 1997-2000 and 2000-2007 periods.

Chart 1 shows that Ontario experienced the largest falloff in labour productivity growth after 2000: 3.11 percentage points. Given that contributions to aggregate productivity are a function of a province's share of total hours worked and the change in productivity growth. Ontario made by far the greatest contribution of -1.31 percentage points, which is 62 per cent of Canada's labour productivity growth fall of -2.10 percentage points. Quebec made the second largest contribution of -0.26 percentage points (12 per cent), and British Columbia made the third largest contribution of -0.25 percentage points (12 per cent).

Two-Digit Industries at the National Level

Between the 1997-2000 and 2000-2007 periods Canada's labour productivity growth rate fell by 2.10 percentage points as noted above. Using a two-digit NAICS industry decomposition, the within-sector effect contributed -2.21 percentage points, the reallocation level effect contributed 0.18 percentage points, and the reallocation growth effect contributed -0.06 percentage points (Table 2). The reallocation effects were higher than in the provincial decomposition because there was significantly more labour reallocation between two-digit industries than between provinces.

The drop in Canada's labour productivity was broadly based. Labour productivity fell in 13 of 15

industries (Chart 2). Over half of the fall in Canada's labour productivity was attributed to the manufacturing industry which contributed -1.11 percentage points, or 53 per cent. Manufacturing's within-sector effect contributed -0.93 percentage points to the change in market sector labour productivity growth between periods. Its reallocation level effect contributed -0.16 percentage points and its reallocation growth effect -0.01 percentage points. The negative reallocation level effect reflected its falling labour share combined with above average labour productivity relative to other Canadian industries. The industry with the second largest contribution to Canada's fall in labour productivity was the agriculture, forestry, fishing and hunting industry that contributed -0.31 percentage points or 15 per cent.

Another point of interest is that the mining and oil and natural gas extraction industry played only a minor role in the post-2000 slowdown in labour productivity; it contributed only -0.10 percentage points (4.8 per cent) despite a drop of 8.22 percentage points in its labour productivity growth rate. It had the second largest within-sector effect contribution of -0.40 percentage points, yet the highest contribution from reallocation level effect, 0.36 percentage points. Its reallocation growth effect contribution was -0.06 percentage points. Although sectoral reallocation level effects were generally small, the mining and oil and gas extraction industry had a very large positive effect because its labour input share was increasing combined with its well above average level of labour productivity.

Two-Digit Industries at the Provincial Level

The next step in the analysis is to combine the information on the post-2000 labour productivity slowdown by the 10 provinces with that by the 15 industries. The resulting matrix of 150 industry-province contributions to the slowdown is further disaggregated into within-sector effects, reallocation level effects and reallocation growth effects. Results for the four largest provinces (Ontario, Quebec, British Columbia, and Alberta) are presented in Table 3.

Despite the large number of province and industry combinations, several made major contributors to the change in Canada's productivity growth. Between the two periods, Ontario's manufacturing industry contributed 0.76 percentage points to the decline in Canada's labour productivity growth of 2.10 percentage points, or 36.3 per cent of the fall, despite accounting for only 6.9 per cent of the hours worked in Canada in 2007.[4] Quebec's manufacturing industry played a similar role; it contributed 0.29 percentage points (13.8 per cent) to the fall in Canada's labour productivity growth rates between periods. The fall in productivity growth in Quebec and Ontario's manufacturing sectors explains half of the fall in productivity growth in Canada between the 1997-2000 and 2000-2007 periods. The third most important industry-provincial combination was Ontario's finance, real estate, renting and leasing industry (FIRE) contributed 0.18 percentage points (8.6 per cent) to the fall in Canada's labour productivity.

Labour productivity growth fell between the two periods for 96 of the 150 province-industry combinations. Eighty-six of 150 industries contributed to the slowdown in Canada's productivity growth. Although 64 of the 150 combinations made a positive contribution to the change in Canada's labour productivity (a negative contribution to the slowdown), the contributions were generally very small.[5]

4 Ontario's labour productivity growth fell from 3.91 per cent per year in the 1997-2000 period to 0.81 per cent per year in the 2000-2007 period, a slowdown of 3.11 percentage points. The largest falls in labour productivity growth were in mining and oil and gas extraction (13.80 percentage points), agriculture, forestry, fishing, and hunting (10.99 points), utilities (6.61 points), and manufacturing (5.83 points). In percentage points contribution to the 3.11 point market sector labour productivity slowdown, manufacturing was by far the largest contributor (-1.73 points or 56 per cent of the slowdown). Thirteen of 15 industries in Ontario experienced a slowdown in labour productivity growth.

Three-digit Industries

This section decomposes Canada's labour productivity at two-digit NAICS industries by their three-digit NAICS industry subsectors. This provides more insight into the change in Canada's labour productivity growth rate by analyzing the contributions of subsectors to industries.[6]

The contributions to the change in Canada's labour productivity growth rate by subsector were estimated using a three-digit level decomposition of Canada's labour productivity growth which included a total of 50 subsectors.

Manufacturing

Labour productivity growth fell from 4.68 per cent per year in 1997-2000 to 1.14 per cent in 2000-2007, a slowdown of 3.55 points. Sixteen of the 20 subsectors experienced a drop in labour productivity growth rates between the two periods (Table 4).

Decomposing the manufacturing industry into its 20 subsectors shows that the within-sector effect contributed -4.61 percentage points, the reallocation level effect contributed 0.86 percentage points, and the reallocation growth effect contributed 0.21 percentage points to the fall in manufacturing's labour productivity growth rate between the two periods. The positive reallocation effects show that despite a very large decline in the labour productivity growth in each subsector of manufacturing, the share of labour input in manufacturing was growing in industries which had higher levels of labour productivity and higher growth rates.[7] The subsector that made the largest contribution to the fall in manufacturing's labour productivity growth rate was the computer and electronic subsector, which contributed 1.06 percentage points. This was closely followed by the transportation equipment manufacturing industry, which contributed 1.04 percentage points. The computer and electronics subsector and transportation and equipment subsector together contributed 2.10 percentage points of the 3.55 percentage point fall or 59 per cent.

At the three-digit NAICS level, both the transportation equipment and computer and electronic subsectors made large contributions to the fall in Canada's labour productivity growth rate. The transportation equipment subsector contributed -0.31 percentage points and the computer and electronic subsector contributed -0.27 percentage points. These two subsectors account for over a quarter of the post-2000 slowdown in Canada's labour productivity growth.

Mining, and Oil and Gas Extraction

All three of the subsectors in mining and oil and gas extraction had negative labour productivity growth in the 2000 to 2007 period, and all of them had a slowdown in the productivity growth rate between the two periods (Table 5).

Nearly all of the change was due to the within-sector effect which contributed -13.14 percentage points to the change in mining, and oil and natural gas's labour productivity growth rate. The reallocation level effect was quite large at 5.39 percentage points as was the reallocation growth effect which was -1.31 percentage points. The oil and gas sector was largely responsible for these three

5 A sector can experience a fall in its productivity growth yet make a negative contribution to the slowdown in aggregate productivity growth. This is possible when there is a large positive reallocation level effect. For example, the utilities sector productivity growth fell 1.9 percentage points between 1997-2000 and 2000-2007 yet this sector made a negative contribution of 2.9 per cent (0.06 points) to the post-2000 slowdown due to a 0.13 percentage points positive reallocation level effect. The increase in labour input share of this very high productivity level sector more than offset the negative within-sector effect.

6 It should be noted that the estimates of the rates of change in labour productivity growth at the two-digit industry level in the previous section are slightly different than those calculated based on the three-digit industries in this section. The difference is due to summing the chain-weighted index values of output to calculate labour productivity as discussed earlier.

7 Ironically the share of labour input in high productivity subsectors may be growing not because of any absolute employment increase but because employment levels are falling at a slower rate than those of low productivity level subsectors.

effects. It contributed -10.62 percentage points to the within sector effect, 3.97 percentage points to the reallocation level effect, and -1.24 percentage points to the reallocation growth effect. Support activities for mining and oil and gas extraction actually had a reallocation growth effect (1.46 percentage points) that was larger than its within-sector effect (-0.57 percentage points), which happened in very few industries.

Although the sum of the contributions by the three subsectors of mining and oil and natural gas was only -0.13 percentage points, there were some interesting effects within the subsectors.[8] The oil and gas extraction sector contributed only -0.02 percentage points to the change in Canada's labour productivity, because its reallocation level effect of 0.89 percentage points largely mitigated its within-sector effect (-0.70 percentage points) and its reallocation growth effect (-0.20 percentage points). The negative labour productivity growth in oil and gas extraction is not contributing significantly to the post-2000 slowdown in Canada's aggregate labour productivity growth because of the very large positive reallocation level effects.

Agriculture, Forestry, Fishing and Hunting

Output per hour growth in agriculture, forestry, fishing, and hunting fell 6.58 percentage points from an average annual rate of 8.78 per cent in 1997-2000 to 2.20 per cent in 2000-2007 (Table 5). Labour productivity growth fell in 3 out of 4 subsectors between periods. Only fishing, hunting and trapping had a positive change in labour productivity growth between 1997-2000 and 2000-2007. The decline in the labour productivity growth rate of the agriculture, forestry, fishing and hunting industry was primarily due to the within-sector effect which contributed -6.08 percentage points and the reallocation level effect which contributed -0.46 percentage points. The fall in crop and animal production's labour productivity growth rate contributed -5.69 percentage points to the fall in the sector's labour productivity growth between periods and accounted for 0.29 percentage points, or 13.8 per cent of the post-2000 slowdown in Canada's market sector labour productivity growth.

Other Services

Table 5 shows that in the other services industry, all three subsectors had falling labour productivity growth rates between the two periods. The decline in the other services industry's labour productivity was primarily due to the within-sector effect which contributed 1.31 percentage points of the 1.58 point fall and to a lesser extent the reallocation level effect which contributed 0.20 percentage points. Religious, grant-making and similar institutions contributed 0.78 percentage points, personal and laundry services contributed 0.60 percentage points and repair and maintenance contributed 0.21 percentage points to the post-2000 decline in the labour productivity growth of the other services industry.

The laundry and personal services subsector was the largest contributor in the other services industry to the change in Canada's market sector labour productivity growth rate at the three-digit NAICS industry level. It contributed -0.04 percentage points (2 per cent of the slowdown).

Administration Services, Waste Management and Remediation Services (ASWMR)

Table 5 shows that both the subsectors of administration services, waste management and remediation services (ASWMR) industry had a positive change in their labour productivity growth rates between the two periods. The growth within the entire industry was primarily due to the within-

8 The number differs from the 0.10 percentage point contribution of the mining and oil and natural gas extraction sector to the slowdown found in Table 2 because it is the summation of the subsector contributions. As noted in footnote 5, when measured in chain dollars two-digit industry growth rates calculated directly differ from those calculated by aggregating the output of the three-digit industries.

sector effect which contributed 0.34 percentage points and the reallocation level effect which contributed 0.24 percentage points. The waste management and remediation subsector contributed 0.46 percentage points to the change in the industry's labour productivity growth rate and the administration and support services contributed 0.26 percentage points.

Information and Cultural Industries

Table 5 shows that in the information and cultural industries sector, only the motion picture and sound recording subsector had a negative change in labour productivity growth between 1997-2000 and 2000-2007. The 2.04 percentage point acceleration in the information and cultural industry labour productivity growth rate was primarily due to the within-sector effect which contributed 1.96 percentage points. The increase in the labour productivity growth rate of broadcasting and telecommunications contributed 1.11 percentage points to the acceleration in the sector's labour productivity growth between periods.

At the three-digit NAICS decomposition level, the contribution by all subsectors of the information and cultural industry to the market sector was small. The publishing, data processing, and information services industry contributed -0.04 percentage points (-2 per cent) to the slowdown in Canada's labour productivity growth, the largest of all information and cultural industry subsectors.

Transportation and Warehousing

Output per hour in the transportation and warehousing sector fell from an average annual rate of 1.65 per cent in 1997-2000 to 0.24 per cent in 2000-2007, a slowdown of 1.41 percentage points. Four of the six subsectors experienced a prodcutivity growth slowdown between periods (Table 5). The decline in the labour productivity growth of the entire industry was primarily due to the within-sector effect, which contributed -1.79 percentage points. The reallocation level effect of the entire industry contributed 0.30 percentage points due to an increase in the share of labour in the high productivity level pipeline transportation subsector, which contributed 0.68 percentage points to the reallocation level effect.

The air, rail, water, and sight-seeing and support transportation subsector, which enjoyed more rapid labour productivity growth after 2000, contributed the most to Canada's change in labour productivity growth among subsectors in the transportation and warehousing industry at 0.04 percentage points (-1.9 per cent of the slowdown). The truck transportation subsector contributed the most to the slowdown at -0.05 percentage points or 2.4 per cent.

Utilities

Table 5 shows that the labour productivity growth in both subsectors of utilities, the electric power, generation and distribution subsector and the natural gas distribution, water and other systems sub sector, fell between the 1997-2000 and 2000-2007 periods. The change in labour productivity growth of the industry was primarily due to the within-sector effect which contributed -1.90 percentage points of the -1.86 point change. The reallocation level effects were negligible because there was very little change in the share of labour between the electric power, generation and distribution subsector and the natural gas distribution, water and other systems sub sector.

At the three digit NAICS decomposition level, the electric power, generation and distribution subsector contributed -0.08 percentage points to the decline in Canada's labour productivity growth of 2.10 percentage points offsetting 3.8 per cent of the slowdown.

Explaining the Manufacturing Productivity Slowdown

Given the important role manufacturing played in the post-2000 labour productivity slowdown in Canada, it is useful to discuss the reasons for this

development. This article makes the case that the slowdown in manufacturing productivity can be linked to a significant fall in the output growth of the sector. This relationship is known as Verdoorn's law, which states that the higher the rate of output growth, the higher the rate of labour productivity growth. Verdoorn (1949) argued that increases in output result in further divisions of labour, higher specialization, lower overhead costs, and ultimately increased labour productivity. Verdoorn's original specification was simply defined as:

$\Delta Labour\ Productivity = \mu + \beta\ \Delta Output$

He estimated that every 10 per cent increase in output is associated with a roughly 4.5 per cent increase in labour productivity.

Kaldor (1966) further specified Verdoorn's law for the manufacturing sector, stating that higher output growth in the manufacturing sector led to higher labour productivity growth in manufacturing and the entire economy. Kaldor found that the relationship within the United Kingdom's manufacturing sector was:

$\Delta Labour\ Productivity = 1.035 + 0.484\ \Delta Output$

His result for manufacturing was very similar to that of Verdoorn's. However, he failed to find evidence of Verdoorn's law in any other industries except for the construction and public utilities industry.

Kaldor further expanded his hypothesis to say that export demand was the primary constraint on manufacturing growth, assuming that output is not constrained on the supply side by either labour or commodity inputs. Thus, his expanded hypothesis is that export demand affects labour productivity growth because increased export demand increases output.[9]

Since Kaldor, other economists have empirically tested for increasing returns to scale in a variety of countries. Leon-Ledesma (1998) found overwhelming support for increasing returns at the regional level in Spain from 1962 to 1991 using Kaldor's hypothesis and alternative specifications of Verdoorn's law.

More recently, Angeriz *et al*. (2008) estimated the Verdoorn law for European Union regional manufacturing, and instead of labour productivity, estimated the relationship between total factor productivity and output growth. Their demand-side specification estimated a range for the Verdoorn coefficient of 0.502 to 0.673.

McCombie and Roberts (2007) found that all 11 studies that estimated the dynamic version of Verdoorn's law found increasing returns to scale.[10] They further assert that static versions suffer from spatial aggregation bias and the results are biased towards constant returns to scale.

Chart 3 shows that the estimates of Canada's labour productivity in manufacturing subsectors are consistent with a dynamic version of Verdoorn's law and has a coefficient of 0.67, higher than Kaldor's estimates but consistent with the manufacturing sectors in other developed countries found by Angeriz *et al*. (2008). The chart is based on the changes in output growth rate and changes in the productivity growth rate between 1997-2000 and 2000-2007. In the manufacturing industries where output growth between the two periods declined substantially, labour productivity growth declined as well. Many manufacturing industries were unable to maintain their productivity growth rate as demand growth fell.

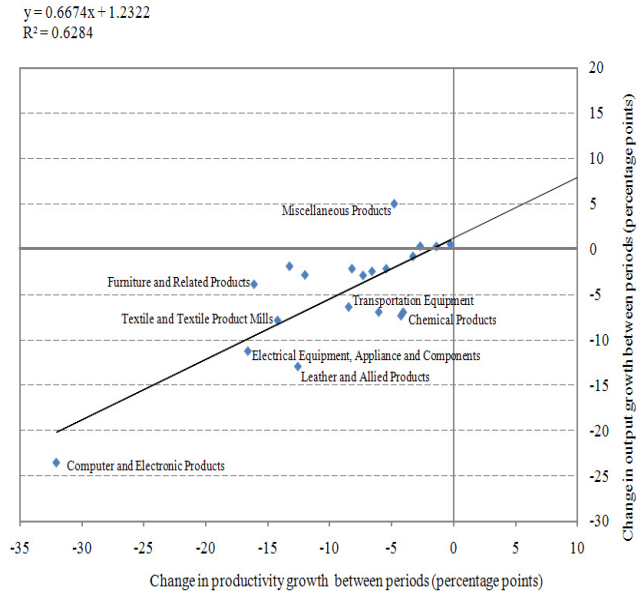
An additional piece of evidence that supports the application of Verdoorn's law to Canadian manufacturing is that capacity utilization was falling dramatically as output fell in the subsectors of manufacturing. Capacity utilization fell in 16 out of 20 subsectors of manufacturing and fell most dramatically in the subsectors with the largest change in productivity and output, computer and electronics and electric equipment (Chart 4). Fall-

9 Kaldor's growth laws from his 1966 lecture are summarized in Thirlwall (1983).

10 The dynamic version of Verdoorn's law uses the growth rates of labour productivity and output rather than absolute the change in levels.

Chart 3

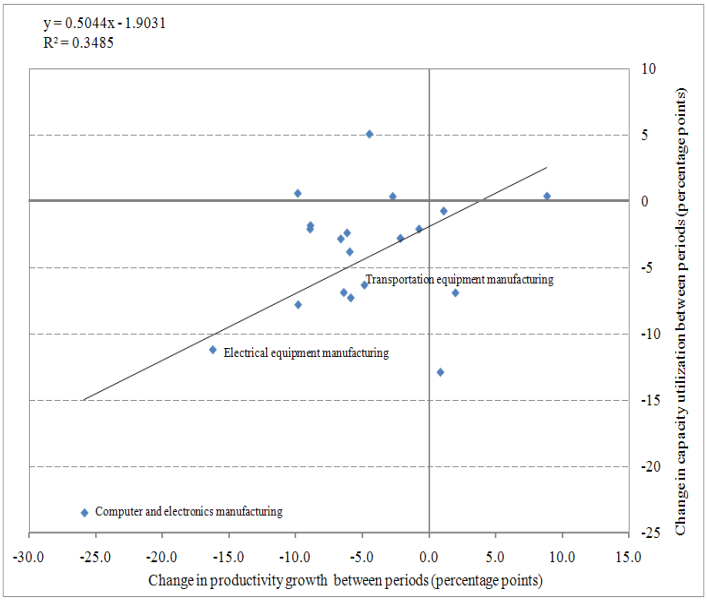
Percentage Point Change in Productivity Growth compared to the Percentage Point Change in Output Growth between in Manufacturing in Canada 1997-2000 and 2000-2007



Source: Table 4.

Chart 4

Percentage Point Change between 1997–2000 and 2001-2007 in Capacity Utilization and Productivity Growth



Source: Statistics Canada.

ing capacity utilization affects productivity in at least two important ways. First, a certain amount of overhead labour will be required independent of the rate of capacity utilization, such as for maintenance, or administrative purposes. This base level of labour means that as output growth falls, labour will not fall by an equivalent amount. Second, falling capacity utilization may increase the number of tasks and responsibilities per worker. Workers will no longer be able to focus and specialize in specific tasks; therefore, their productivity in the tasks they perform will be reduced. In the entire manufacturing sector, capacity utilization grew from 83.6 to 86.0 per cent between 1997 and 2000, but fell to 82.9 per cent in 2007. The capacity utilization of computer and electronic equipment manufacturing, which had the largest fall in output and labour productivity growth rate, rose from 79.3 to 96.6 per cent between 1997 and 2000 and then fell to 88 per cent in 2007.

There is also evidence that Canada fits into the Kaldorian model of export led growth, particularly in Canada's manufacturing sector. The domestic components of aggregate demand were stable in the 2000-2007 period relative to 1997-2000. In both periods, real consumption advanced at an annual rate of 3.5 per cent, government spending grew 2.7-2.8 per cent, and business investment increased around 5 per cent. Despite this stability of domestic demand, real GDP fell from an average annual rate of advance of 5.0 per cent in 1997-2000 to 2.5 per cent in 2000-2007. All of this slowdown was due to the plunge in export growth from 9.6 per cent per year to 0.6 per cent.

Chart 5 shows that between the 1997-2000 and 2000-2007 period, the growth in export volume fell dramatically in many commodities directly tied to the subsectors of manufacturing with the largest falls in productivity growth. Furthermore, Chart 6 shows that Canada's exports as a share of GDP fell from 45.6 per cent to 34.9 per cent from 2000 to 2007. This is evidence that a decline in output growth in the manufacturing sector was

caused by a decline in the demand for manufacturing exports.

It is clear that both output growth and labour productivity growth in manufacturing stagnated in the period after 2000. Applying Verdoorn's law, it seems that the fall in output demand in manufacturing is what led to a fall in labour productivity by reducing the capacity utilization in much of manufacturing's subsectors. Furthermore, the fall in output was not caused by a fall in the domestic demand for manufactured goods, but due to a fall in the demand for manufacturing exports after 2000.

Conclusion

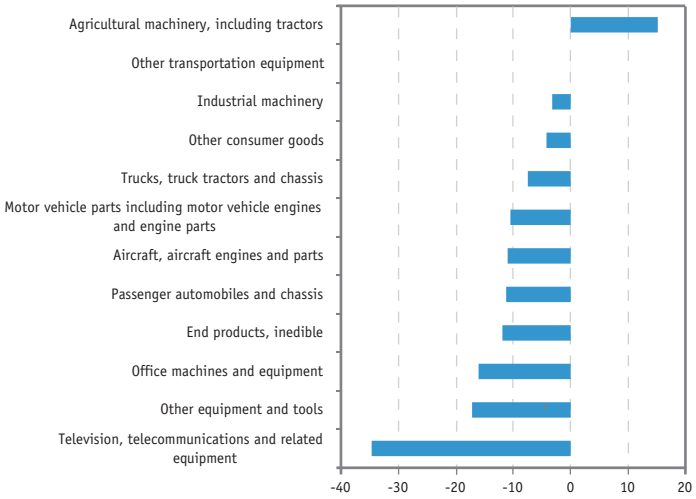
The new productivity database allowed us to decompose Canada's productivity in the 1997-2000 and 2000-2007 periods to shed light on the nature of the post-2000 productivity slowdown by province, by industry and by industry-province. Below we present the key conclusions to our analysis.

The within-sector effect, that is the change in labour productivity growth rate of a particular province or industry, was much more important than the reallocation effects for both provincial and industrial decompositions of labour productivity growth. Essentially, sectoral reallocations cannot explain much of the change in labour productivity growth in Canada.[11] The within-sector effects were particularly important for the provincial decomposition because there was very little labour mobility between provinces.

Ontario made the largest contribution to the decline in Canada's labour productivity growth rate between the 1997-2000 and 2000-2007 periods. Sixty-two per cent of the fall in Canada's labour productivity growth rate can be attributed to Ontario.

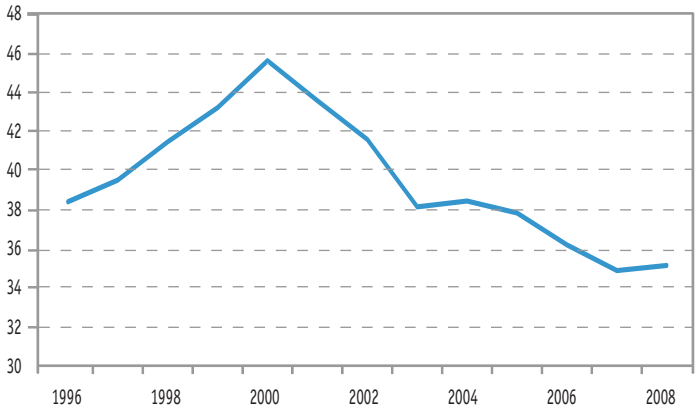
Manufacturing was the industry that made the largest contribution to Canada's falling productivity growth. It contributed -1.11 percentage points to the -2.10 percentage point change in Canada's labour productivity growth between the two periods or 53 per cent. Within manufacturing, 16 of the 20 subsectors had falling productivity levels. The transportation manufacturing subsector and the computer and electronic manufacturing subsector

Chart 5
Percentage Point Change in Export Volume Growth Rate between 1997-2000 and 2000-2007



Source: Statistics Canada.

Chart 6
Nominal Exports as a Share of Nominal GDP, 1996-2008
(Per Cent)



Source: Statistics Canada.

11 This is consistent with the results for the slowdown between the 1973-2000 and 2000-2007 periods (Sharpe 2010b).

were responsible for approximately a quarter of the fall in Canada's labour productivity growth.

It is clear that output growth and labour productivity growth in manufacturing stagnated in the period after 2000. Applying Verdoorn's law, it appears that the fall in growth of demand for manufacturing products led to a fall in output growth and hence in productivity growth. Furthermore, the fall in output was not caused by a fall in the domestic demand for manufactured goods, but due to a fall in the demand for manufacturing exports.

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Tables

Table 1

A Comparison of Provincial Contributions to Market Sector Labour Productivity Growth in 1997-2000 and 2000-2007 Decomposed into Within-sector, Reallocation Level Effects, and Reallocation Growth Effects

	Labour Productivity				Output Growth				Contribution to Aggregate Labour Productivity Growth in the Market Sector by Province			
	1997-2007	1997-2000	2000-2007	Difference between periods	1997-2007	1997-2000	2000-2007	Difference between periods	Within-Province Effect	Reallocation Level Effect	Reallocation Growth Effect	Total
									1997 to 2007			
	(compound annual growth rate)				(compound annual growth rate)				(percentage points)			
Canada	1.71	3.18	1.09	-2.10	3.61	5.99	2.61	-3.37	N/A	N/A	N/A	N/A
Newfoundland and Labrador	4.02	4.83	3.68	-1.15	6.68	8.70	5.83	-2.87	0.04	0.00	0.00	0.04
Prince Edward Island	1.63	3.01	1.04	-1.97	2.95	4.62	2.25	-2.37	0.00	0.00	0.00	0.00
Nova Scotia	1.95	3.24	1.40	-1.84	3.22	5.73	2.16	-3.57	0.04	0.00	0.00	0.04
New Brunswick	1.79	2.89	1.33	-1.56	3.08	5.52	2.05	-3.46	0.03	0.00	0.00	0.03
Quebec	1.74	2.62	1.36	-1.26	3.33	6.23	2.11	-4.12	0.37	0.00	0.00	0.37
Ontario	1.72	3.91	0.80	-3.11	3.71	7.64	2.07	-5.56	0.71	0.00	0.00	0.71
Manitoba	2.12	3.75	1.43	-2.32	2.86	3.72	2.49	-1.23	0.07	0.01	0.00	0.07
Saskatchewan	2.17	3.64	1.55	-2.09	1.98	2.70	1.68	-1.02	0.07	0.00	0.00	0.08
Alberta	1.41	1.83	1.24	-0.59	4.06	4.32	3.95	-0.37	0.19	0.02	-0.00	0.21
British Columbia	1.20	2.36	0.71	-1.65	3.29	3.04	3.39	0.35	0.15	-0.00	-0.00	0.14
Sum Total									1.68	0.04	-0.00	1.71

	Contribution to Aggregate Labour Productivity Growth in the Market Sector by Province												
	1997 to 2000				2000 to 2007				Difference Between Periods				
	Within-Province Effect	Reallocation Level Effect	Reallocation Growth Effect	Total	Within-Province Effect	Reallocation Level Effect	Reallocation Growth Effect	Total	Within-Province Effect	Reallocation Level Effect	Reallocation Growth Effect	Total	Per Cent Contribution to the Slowdown in Labour Productivity
Canada	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Newfoundland and Labrador	0.05	0.00	0.00	0.05	0.04	0.00	0.00	0.04	-0.01	0.00	0.00	-0.01	0.29
Prince Edward Island	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	-0.01	0.00	0.00	-0.01	0.31
Nova Scotia	0.06	0.00	0.00	0.07	0.03	0.00	0.00	0.03	-0.04	0.00	0.00	-0.03	1.63
New Brunswick	0.05	0.00	0.00	0.05	0.02	0.00	0.00	0.03	-0.03	0.00	0.00	-0.02	1.12
Quebec	0.56	0.00	0.00	0.55	0.29	0.01	0.00	0.30	-0.26	0.01	0.00	-0.26	**12.15**
Ontario	1.62	0.01	0.01	1.65	0.34	-0.01	0.00	0.34	-1.28	-0.02	-0.01	-1.31	**62.21**
Manitoba	0.12	0.01	0.00	0.13	0.04	0.00	0.00	0.04	-0.08	-0.01	0.00	-0.09	4.26
Saskatchewan	0.12	0.01	0.00	0.13	0.05	0.00	0.00	0.05	-0.07	-0.01	0.00	-0.08	3.78
Alberta	0.25	0.00	0.00	0.25	0.16	0.02	0.00	0.19	-0.08	0.03	0.00	-0.05	2.58
British Columbia	0.29	0.01	0.01	0.31	0.08	-0.01	0.00	0.06	-0.21	-0.02	-0.01	-0.25	**11.68**
Sum Total	3.12	0.05	0.01	3.18	1.06	0.03	0.00	1.08	-2.06	-0.02	-0.02	-2.10	100

Source: These estimates have been calculated by the CSLS using unpublished Statistics Canada data. Note that the aggregate Canada measure of output was calculated using the sum of the provincial components, which are the sum of the real industrial output in each province. This results in slight differences in the labour productiivty growth rates presented here and the database available on the CSLS website.

Table 2

A Comparison of Sectoral Contributions to Market Sector Labour Productivity Growth in 1997-2000 and 2000-2007 Decomposed into Within-sector, Reallocation Level Effects, and Reallocation Growth Effects, Canada

	Labour Productivity				Output Growth				Contribution to Aggregate Labour Productivity Growth in Market Sector by Industry 1997-2007			
	1997-2007	1997-2000	2000-2007	Difference between periods	1997-2007	1997-2000	2000-2007	Difference between periods	Within-Sector Effect	Reallocation Level Effect	Reallocation Growth Effect	Total
	(compound annual growth rate)				(compound annual growth rate)				(percentage points)			
Market Sector	1.71	3.18	1.09	-2.10	3.61	5.99	2.61	-3.37	N/A	N/A	N/A	N/A
Agriculture, Forestry, Fishing and Hunting	4.21	8.70	2.34	-6.36	1.28	4.34	-0.01	-4.35	0.16	0.08	-0.06	0.18
Mining and Oil and Gas Extraction	-2.24	3.58	-4.64	-8.22	1.49	1.30	1.58	0.28	-0.11	0.08	-0.02	-0.05
Utilities	-0.93	0.39	-1.49	-1.88	0.74	-0.14	1.12	1.26	-0.04	-0.01	0.00	-0.04
Construction	1.75	2.09	1.60	-0.49	5.54	4.43	6.02	1.59	0.13	-0.02	0.03	0.13
Manufacturing	2.25	4.94	1.11	-3.83	1.95	7.72	-0.43	-8.15	0.56	-0.09	-0.11	0.36
Wholesale Trade	3.73	4.75	3.29	-1.46	5.23	7.04	4.47	-2.57	0.30	0.00	-0.01	0.29
Retail Trade	3.35	4.10	3.03	-1.07	5.06	5.76	4.77	-1.00	0.26	0.01	-0.01	0.27
Transportation and Warehousing	0.69	1.74	0.24	-1.50	2.88	4.72	2.10	-2.62	0.04	0.00	0.00	0.04
Information and Cultural Industries	3.00	1.59	3.62	2.03	5.60	9.39	4.02	-5.37	0.14	0.01	0.01	0.16
Finance, Insurance, Real Estate and Renting and Leasing	1.51	2.52	1.09	-1.44	4.08	4.94	3.72	-1.22	0.23	0.05	0.02	0.30
Professional, Scientific and Technical Services	1.33	3.31	0.49	-2.82	5.49	11.08	3.18	-7.90	0.07	-0.03	0.02	0.05
Administrative and Support, Waste Management and Remediation Services	0.34	-0.18	0.57	0.75	6.20	7.51	5.65	-1.86	0.01	-0.07	0.00	-0.05
Arts, Entertainment and Recreation	-1.20	-1.13	-1.23	-0.10	2.91	3.92	2.48	-1.44	-0.01	-0.01	0.00	-0.03
Accommodation and Food Services	1.08	1.83	0.76	-1.06	2.52	4.35	1.75	-2.60	0.03	0.02	0.00	0.05
Other Services (Except Public Administration)	2.13	3.03	1.74	-1.29	4.01	5.78	3.26	-2.52	0.05	0.00	0.00	0.05
Sum Total									1.83	0.02	-0.14	1.71

	Contribution to Aggregate Labour Productivity Growth in Market Sector by Industry												
	1997 to 2000				2000 to 2007				Difference Between 1997-2000 and 2000-2007				
	Within-Sector Effect	Reallocation Level Effect	Reallocation Growth Effect	Total	Within-Sector Effect	Reallocation Level Effect	Reallocation Growth Effect	Total	Within-Sector Effect	Reallocation Level Effect	Reallocation Growth Effect	Total	Per Cent Contribution to the Slowdown in Labour Productivity
	(percentage points)												
Market Sector	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Agriculture, Forestry, Fishing and Hunting	0.31	0.14	-0.02	0.42	0.08	0.05	-0.01	0.12	-0.23	-0.09	0.02	-0.31	**14.83**
Mining and Oil and Gas Extraction	0.20	-0.17	-0.02	0.01	-0.19	0.19	-0.08	-0.09	-0.40	0.36	-0.06	-0.10	4.78
Utilities	0.02	-0.10	0.00	-0.08	-0.05	0.03	0.00	-0.02	-0.07	0.13	-0.01	0.06	-2.87
Construction	0.15	0.00	0.00	0.15	0.11	-0.03	0.01	0.08	-0.04	-0.04	0.00	-0.07	3.35
Manufacturing	1.22	0.00	0.00	1.21	0.28	-0.16	-0.01	0.10	-0.93	-0.16	-0.01	-1.11	**53.11**
Wholesale Trade	0.36	0.00	0.00	0.36	0.27	0.00	0.00	0.26	-0.09	0.00	0.00	-0.09	4.31
Retail Trade	0.30	0.07	0.00	0.37	0.23	-0.01	0.00	0.22	-0.07	-0.08	0.00	-0.15	7.18
Transportation and Warehousing	0.11	0.00	0.00	0.11	0.01	0.00	0.00	0.01	-0.10	0.00	0.00	-0.10	4.78
Information and Cultural Industries	0.07	0.09	0.00	0.15	0.19	-0.02	-0.01	0.16	0.12	-0.11	-0.01	0.00	0.00
Finance, Insurance, Real Estate and Renting and Leasing	0.39	-0.02	0.00	0.36	0.16	0.08	0.01	0.25	-0.23	0.10	0.01	-0.12	5.74
Professional, Scientific and Technical Services	0.17	-0.07	-0.01	0.09	0.03	-0.02	0.00	0.01	-0.14	0.05	0.00	-0.09	4.31
Administrative and Support, Waste Management and Remediation Services	0.00	-0.08	-0.02	-0.10	0.02	-0.08	-0.01	-0.07	0.02	0.00	0.01	0.03	-1.44
Arts, Entertainment and Recreation	-0.01	-0.01	0.00	-0.03	-0.01	-0.02	0.00	-0.03	0.00	0.00	0.00	0.00	0.00
Accommodation and Food Services	0.06	0.01	0.00	0.07	0.02	0.02	0.00	0.05	-0.04	0.02	0.00	-0.02	0.96
Other Services (Except Public Administration)	0.07	0.00	0.00	0.07	0.04	0.00	0.00	0.04	-0.03	0.00	0.00	-0.03	1.44
Sum Total	3.40	-0.15	-0.07	3.18	1.19	0.03	-0.13	1.09	-2.21	0.18	-0.06	-2.09	100

Source: These estimates have been calculated by the CSLS using unpublished Statistics Canada data. Note that, the aggregate Canada measure of output was calculated using the sum of the provincial components which are the sum of the real industrial output in each province. This results in slight differences in the labour productivity growth rates presented here and the database available on the CSLS website.

Table 3

Industry Contributions of the Four Largest Provinces to the Change in Canada's Labour Productivity Growth between 1997-2000 and 2000-2007 Decomposed into Within-sector, Reallocation Level Effects, and Reallocation Growth Effects

	Contribution to Aggregate Labour Productivity Growth in Canada's Market Sector by Province and Industry														
	Labour Productivity		1997 - 2000				2000 - 2007				Difference Between 1997 - 2000 and 2000 - 2007				
	1997 - 2000	2000 - 2007	Within-Sector Effect	Realloc-ation Level Effect	Realloc-ation Growth Effect	Total	Within-Sector Effect	Realloc-ation Level Effect	Realloc-ation Growth Effect	Total	Within-Sector Effect	Realloc-ation Level Effect	Realloc-ation Growth Effect	Total	Per Cent Contribution to the Slowdown in Labour Productivity
	(compound annual growth rate)		(percentage points)				(percentage points)				(percentage point differences)				
Canada	3.18	1.09	3.12	0.05	0.01	3.18	1.06	0.03	0.00	1.08	-2.06	-0.02	-0.02	-2.10	100
Ontario															
Agriculture, Forestry, Fishing and Hunting	10.84	-0.16	0.08	0.05	-0.01	0.12	0.00	0.01	0.00	0.01	-0.08	-0.04	0.01	-0.11	5.18
Mining and Oil and Gas Extraction	5.80	-8.00	0.03	-0.01	0.00	0.01	-0.03	0.02	-0.02	-0.02	-0.06	0.03	-0.01	-0.03	1.60
Utilities	3.76	-2.85	0.06	-0.08	-0.01	-0.02	-0.03	0.03	-0.01	-0.01	-0.10	0.11	0.00	0.01	-0.62
Construction	2.16	1.47	0.06	-0.01	0.00	0.05	0.04	-0.01	0.00	0.03	-0.02	0.00	0.00	-0.02	0.90
Manufacturing	6.28	0.75	0.79	-0.03	-0.02	0.74	0.09	-0.12	0.00	-0.02	-0.69	-0.09	0.02	-0.76	**36.28**
Wholesale Trade	6.25	3.28	0.22	0.00	0.00	0.22	0.13	0.00	0.00	0.13	-0.09	0.00	-0.01	-0.09	4.46
Retail Trade	4.17	2.65	0.12	0.01	0.00	0.12	0.08	0.00	0.00	0.08	-0.04	-0.01	0.00	-0.05	2.26
Transportation and Warehousing	0.94	-0.09	0.02	0.00	0.00	0.02	0.00	0.00	0.00	0.00	-0.02	0.00	0.00	-0.02	0.96
Information and Cultural Industries	1.40	3.22	0.02	0.06	0.00	0.08	0.07	-0.01	0.00	0.06	0.05	-0.07	0.00	-0.02	0.90
Finance, Insurance, Real Estate and Renting and Leasing	3.66	0.56	0.27	0.01	0.00	0.28	0.04	0.06	0.00	0.10	-0.23	0.05	0.00	-0.18	**8.58**
Professional, Scientific and Technical Services	3.96	0.43	0.09	-0.04	0.00	0.06	0.01	0.00	0.00	0.01	-0.08	0.04	0.00	-0.05	2.18
Administrative and Support, Waste Management and Remediation Services	0.54	0.65	0.01	-0.03	-0.01	-0.03	0.01	-0.03	0.00	-0.03	0.00	0.00	0.00	0.00	-0.21
Arts, Entertainment and Recreation	0.45	-0.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	0.00	0.00	0.00	0.00	0.17
Accommodation and Food Services	2.51	-0.34	0.03	-0.04	0.00	-0.01	0.00	0.01	0.00	0.01	-0.03	0.05	0.01	0.02	-1.11
Other Services (Except Public Administration)	3.42	0.70	0.03	-0.01	0.00	0.02	0.01	0.00	0.00	0.00	-0.02	0.01	0.00	-0.01	0.69
Quebec															
Agriculture, Forestry, Fishing and Hunting	6.99	2.40	0.04	0.01	0.00	0.05	0.01	0.00	0.00	0.02	-0.03	-0.01	0.00	-0.03	1.46
Mining and Oil and Gas Extraction	6.15	-2.32	0.02	0.00	0.00	0.01	0.00	0.00	0.00	-0.01	-0.02	0.00	0.00	-0.01	0.67
Utilities	-1.59	-1.49	-0.02	-0.01	0.00	-0.03	-0.01	0.01	0.00	-0.01	0.00	0.02	0.00	0.02	-1.03
Construction	1.99	2.30	0.03	0.00	0.00	0.03	0.03	0.00	0.00	0.03	0.00	0.00	0.00	0.01	-0.29
Manufacturing	4.92	1.30	0.32	0.01	0.00	0.33	0.09	-0.04	-0.01	0.04	-0.23	-0.05	-0.01	-0.29	**13.89**
Wholesale Trade	1.27	4.30	0.02	0.00	0.00	0.01	0.07	0.00	-0.01	0.07	0.05	0.01	0.00	0.06	-2.71
Retail Trade	3.43	2.67	0.06	0.02	0.00	0.08	0.05	0.00	0.00	0.04	-0.01	-0.02	0.00	-0.03	1.58
Transportation and Warehousing	-0.54	0.84	-0.01	0.00	0.00	-0.01	0.01	0.00	0.00	0.01	0.02	0.00	0.00	0.02	-1.14
Information and Cultural Industries	-3.98	3.62	-0.04	0.04	-0.02	-0.01	0.04	-0.01	0.00	0.03	0.08	-0.05	0.01	0.04	-2.13
Finance, Insurance, Real Estate and Renting and Leasing	2.41	0.52	0.07	-0.01	0.00	0.06	0.01	0.01	0.00	0.03	-0.06	0.02	0.00	-0.04	1.76
Professional, Scientific and Technical Services	1.60	1.34	0.02	-0.02	0.00	-0.01	0.01	0.00	0.00	0.01	0.00	0.02	0.00	0.02	-0.92
Administrative and Support, Waste Management and Remediation Services	0.30	1.48	0.00	-0.03	-0.01	-0.03	0.01	-0.01	0.00	0.00	0.01	0.02	0.01	0.03	-1.47
Arts, Entertainment and Recreation	-0.43	-0.36	0.00	0.00	0.00	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	-0.24
Accommodation and Food Services	3.28	1.10	0.02	0.04	0.00	0.06	0.01	0.00	0.00	0.00	-0.01	-0.04	0.00	-0.06	2.75
Other Services (Except Public Administration)	3.99	2.96	0.02	0.00	0.00	0.02	0.02	0.01	0.00	0.02	0.00	0.01	0.00	0.00	-0.05

Source: These estimates have been calculated by the CSLS using unpublished Statistics Canada data.

Table 3, continued

Industry Contributions of the Four Largest Provinces to the Change in Canada's Labour Productivity Growth between 1997-2000 and 2000-2007 Decomposed into Within-sector, Reallocation Level Effects, and Reallocation Growth Effects

	Contribution to Aggregate Labour Productivity Growth in Canada's Market Sector by Province and Industry														
	Labour Productivity		1997 - 2000				2000 - 2007				Difference Between 1997 - 2000 and 2000 - 2007				
	1997 - 2000	2000 - 2007	Within-Sector Effect	Reallocation Level Effect	Reallocation Growth Effect	Total	Within-Sector Effect	Reallocation Level Effect	Reallocation Growth Effect	Total	Within-Sector Effect	Reallocation Level Effect	Reallocation Growth Effect	Total	Per cent Contribution to the Slowdown in Labour Productivity
	(compound annual growth rate)		(percentage points)				(percentage points)				(percentage point differences)				
British Columbia															
Agriculture, Forestry, Fishing and Hunting	-6.14	2.55	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.01	0.02	0.00	0.00	0.02	-0.74
Mining and Oil and Gas Extraction	0.00	-3.06	0.05	-0.02	-0.01	0.01	-0.01	0.02	-0.01	0.00	-0.06	0.04	0.00	-0.01	0.52
Utilities	4.96	4.96	-0.02	0.01	0.00	0.00	0.02	-0.01	-0.01	0.00	0.04	-0.02	0.00	0.01	-0.33
Construction	-0.20	-1.23	0.01	0.01	0.01	0.03	-0.01	-0.02	-0.01	-0.04	-0.01	-0.03	-0.02	-0.07	3.19
Manufacturing	9.45	1.75	0.11	0.00	0.00	0.12	0.04	-0.01	0.00	0.03	-0.07	-0.01	0.00	-0.09	4.24
Wholesale Trade	-4.17	3.44	0.05	0.00	0.00	0.05	0.03	0.00	0.00	0.03	-0.02	-0.01	0.00	-0.02	0.93
Retail Trade	0.51	1.93	0.05	0.03	0.00	0.09	0.02	-0.01	0.00	0.01	-0.03	-0.04	0.00	-0.08	3.71
Transportation and Warehousing	5.65	-0.18	0.04	0.00	0.00	0.04	0.00	0.00	0.00	0.00	-0.04	0.00	0.00	-0.04	1.98
Information and Cultural Industries	5.46	4.33	0.02	0.00	0.00	0.02	0.03	0.00	0.00	0.03	0.01	0.00	0.00	0.00	-0.23
Finance, Insurance, Real Estate and Renting and Leasing	5.08	1.88	-0.02	-0.01	0.00	-0.02	0.04	0.00	0.00	0.03	0.05	0.01	0.00	0.06	-2.70
Professional, Scientific and Technical Services	3.80	0.27	0.01	0.00	0.00	0.00	0.00	-0.01	0.00	-0.01	0.00	0.00	0.00	-0.01	0.24
Administrative and Support, Waste Management and Remediation Services	3.75	-1.71	-0.01	0.00	0.00	-0.02	0.00	-0.02	-0.01	-0.03	0.01	-0.02	0.00	-0.01	0.51
Arts, Entertainment and Recreation	-0.82	-3.10	-0.01	0.00	0.00	-0.01	0.00	-0.01	0.00	-0.01	0.00	0.00	0.00	0.00	0.02
Accommodation and Food Services	0.89	1.10	0.00	0.01	0.00	0.01	0.01	0.00	0.00	0.01	0.01	-0.01	0.00	0.00	0.04
Other Services (Except Public Administration)	-4.28	1.58	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	-0.01	0.00	-0.01	0.31
Alberta															
Agriculture, Forestry, Fishing and Hunting	3.64	4.40	0.08	0.04	-0.01	0.11	0.02	0.01	-0.01	0.03	-0.05	-0.03	0.01	-0.08	3.78
Mining and Oil and Gas Extraction	1.83	-6.19	0.01	-0.08	0.00	-0.06	-0.15	0.14	-0.08	-0.08	-0.15	0.22	-0.08	-0.02	0.75
Utilities	2.36	-1.85	0.00	-0.01	0.00	-0.01	-0.01	0.01	0.00	0.00	-0.01	0.01	0.00	0.01	-0.31
Construction	14.38	3.15	0.03	0.00	0.00	0.03	0.04	0.00	0.01	0.05	0.01	0.00	0.01	0.02	-0.97
Manufacturing	0.25	2.73	0.02	0.01	0.00	0.03	0.05	-0.01	0.00	0.04	0.04	-0.02	0.00	0.02	-0.81
Wholesale Trade	-0.17	3.17	0.01	0.00	0.00	0.01	0.03	0.00	0.00	0.03	0.01	0.00	0.00	0.01	-0.67
Retail Trade	2.79	5.16	0.03	0.00	0.00	0.03	0.04	-0.01	0.00	0.04	0.01	-0.01	0.00	0.01	-0.37
Transportation and Warehousing	0.84	0.18	0.04	0.00	0.00	0.04	0.00	0.00	0.00	0.00	-0.04	0.00	0.00	-0.04	1.69
Information and Cultural Industries	1.53	4.91	0.03	0.00	0.00	0.03	0.03	0.00	0.00	0.02	0.00	0.00	0.00	-0.01	0.38
Finance, Insurance, Real Estate and Renting and Leasing	4.23	2.65	0.01	0.00	0.00	0.01	0.04	0.01	0.00	0.06	0.03	0.01	0.00	0.05	-2.17
Professional, Scientific and Technical Services	4.02	0.62	0.03	0.00	0.00	0.03	0.00	-0.01	0.00	0.00	-0.03	0.00	0.00	-0.03	1.66
Administrative and Support, Waste Management and Remediation Services	6.20	1.18	0.00	-0.01	0.00	-0.01	0.00	-0.01	0.00	-0.01	0.00	0.00	0.00	0.00	-0.16
Arts, Entertainment and Recreation	0.55	-0.44	-0.01	0.00	0.00	-0.01	0.00	-0.01	0.00	-0.01	0.00	0.00	0.00	0.00	-0.02
Accommodation and Food Services	4.76	3.47	0.00	-0.01	0.00	-0.01	0.02	0.01	0.00	0.02	0.02	0.02	0.00	0.03	-1.63
Other Services (Except Public Administration)	-0.19	0.61	0.01	0.01	0.00	0.02	0.00	-0.01	0.00	-0.01	-0.01	-0.02	0.00	-0.03	1.44
Sum Total of Four Largest Provincial Industries			2.94	-0.09	-0.10	2.75	1.07	-0.01	-0.16	0.89	-1.88	0.08	-0.06	-1.86	88.61

Source: These estimates have been calculated by the CSLS using unpublished Statistics Canada data.

Table 4

A Comparison of Sub-Sector Contributions to Labour Productivity Growth in Manufacturing between 1997-2000 and 2000-2007 Decomposed into Within-Sector, Reallocation Level Effect, and Reallocation Growth Effect

	Output				Labour Productivity				Contribution to Labour Productivity Growth in Manufacturing Sector by Sub-Sector			
	1997-2007	1997-2000	2000-2007	Difference between periods	1997-2007	1997-2000	2000-2007	Difference between periods	Within-Sector Effect	Reallocation Level Effect	Reallocation Growth Effect	Total
									1997 to 2007			
	(compound annual growth rate)				(compound annual growth rate)				(percentage points)			
Manufacturing Sector	1.80	7.82	-0.68	-8.50	2.19	4.68	1.14	-3.55				
Food manufacturing	2.67	3.62	2.26	-1.37	3.03	2.78	3.14	0.36	0.00	0.00	0.00	0.00
Beverage and tobacco product manufacturing	-2.98	0.00	-4.23	-4.23	-0.79	4.36	-2.92	-7.28	0.30	0.00	0.00	0.30
Textile and textile product mills	-3.18	6.96	-7.23	-14.19	0.25	5.77	-2.03	-7.80	-0.03	-0.03	0.01	-0.05
Clothing manufacturing	-4.63	4.81	-8.41	-13.22	-1.30	-0.02	-1.85	-1.83	0.00	0.02	0.01	0.04
Leather and allied product manufacturing	-7.83	1.13	-11.42	-12.55	-1.74	7.45	-5.44	-12.89	-0.02	0.05	0.03	0.05
Wood product manufacturing	2.31	7.46	0.17	-7.29	3.08	5.07	2.24	-2.83	0.00	0.01	0.01	0.02
Paper manufacturing	-0.73	3.53	-2.50	-6.02	-0.09	4.78	-2.11	-6.88	0.19	0.00	0.00	0.20
Printing and related support activities	0.63	5.27	-1.30	-6.57	1.08	2.75	0.37	-2.39	-0.01	0.00	0.00	0.00
Petroleum and coal products manufacturing	1.03	1.19	0.97	-0.22	-2.76	-3.17	-2.58	0.59	0.03	0.00	0.00	0.04
Chemical manufacturing	2.57	5.42	1.38	-4.04	2.28	7.16	0.25	-6.90	-0.04	0.05	-0.03	-0.02
Plastics and rubber products manufacturing	3.02	8.81	0.63	-8.18	1.39	2.86	0.76	-2.10	0.18	0.02	0.00	0.20
Non-metallic mineral product manufacturing	4.45	6.33	3.65	-2.68	2.32	2.06	2.44	0.38	0.06	-0.02	-0.01	0.03
Primary metal manufacturing	2.44	6.26	0.84	-5.42	4.42	5.89	3.79	-2.09	0.06	0.00	0.00	0.06
Fabricated metal product manufacturing	3.59	12.12	0.14	-11.98	1.65	3.61	0.83	-2.79	0.29	-0.01	-0.03	0.25
Machinery manufacturing	2.54	4.83	1.57	-3.26	2.77	3.28	2.55	-0.74	0.11	-0.03	-0.02	0.06
Computer and electronic product manufacturing	2.04	25.44	-6.61	-32.05	3.43	20.40	-3.09	-23.49	0.21	0.00	0.00	0.21
Electrical equipment, appliance and component	-0.65	11.24	-5.35	-16.59	0.24	8.21	-2.99	-11.19	0.14	0.01	0.00	0.15
Transportation equipment manufacturing	2.04	8.03	-0.42	-8.45	3.28	7.75	1.43	-6.32	0.00	0.00	0.00	0.01
Furniture and related product manufacturing	3.34	14.85	-1.23	-16.09	2.66	5.35	1.53	-3.81	0.64	-0.05	-0.03	0.56
Miscellaneous manufacturing	4.58	7.95	3.18	-4.77	3.16	-0.36	4.71	5.07	0.07	-0.01	0.00	0.05
Sum Total									2.25	0.01	-0.05	2.15

	Contribution to Manufacturing Labour Productivity Growth by Sub-Sector												
	1997 to 2000				2000 to 2007				Difference Bewtween Periods				
	Within-Sector Effect	Reallocation Level Effect	Reallocation Growth Effect	Total	Within-Sector Effect	Reallocation Level Effect	Reallocation Growth Effect	Total	Within-Sector Effect	Reallocation Level Effect	Reallocation Growth Effect	Total	Per Cent Contribution to the Slowdown in Labour Productivity
	(percentage points)												
Food manufacturing	0.26	0.03	0.01	0.30	0.29	-0.01	0.01	0.28	0.03	-0.04	-0.01	-0.02	0.58
Beverage and tobacco product manufacturing	0.17	-0.12	-0.02	0.04	-0.08	0.00	0.00	-0.08	-0.26	0.13	0.01	-0.12	3.31
Textile and textile product mills	0.09	0.01	0.00	0.11	-0.03	0.03	0.01	0.01	-0.12	0.01	0.01	-0.10	2.72
Clothing manufacturing	0.00	-0.04	-0.01	-0.05	-0.04	0.10	0.03	0.10	-0.03	0.14	0.04	0.15	-4.21
Leather and allied product manufacturing	0.02	0.02	0.00	0.05	-0.01	0.01	0.00	0.00	-0.03	-0.01	0.00	-0.05	1.28
Wood product manufacturing	0.31	0.00	0.00	0.31	0.14	0.00	0.00	0.14	-0.17	0.00	0.00	-0.17	4.73
Paper manufacturing	0.34	-0.04	-0.01	0.29	-0.12	0.01	-0.01	-0.12	-0.46	0.05	-0.01	-0.41	**11.63**
Printing and related support activities	0.09	0.00	0.00	0.09	0.01	0.00	0.00	0.01	-0.08	0.00	0.00	-0.08	2.26
Petroleum and coal products manufacturing	-0.06	0.02	-0.01	-0.04	-0.04	0.04	-0.02	-0.01	0.02	0.02	-0.01	0.03	-0.83
Chemical manufacturing	0.58	-0.10	-0.04	0.44	0.02	0.08	-0.01	0.09	-0.56	0.19	0.03	-0.34	**9.69**
Plastics and rubber products manufacturing	0.13	-0.03	-0.01	0.09	0.04	-0.02	0.00	0.02	-0.10	0.01	0.01	-0.08	2.15
Non-metallic mineral product manufacturing	0.05	0.00	0.00	0.05	0.06	-0.01	0.01	0.06	0.01	-0.01	0.01	0.01	-0.40
Primary metal manufacturing	0.35	-0.01	-0.01	0.33	0.24	-0.01	-0.02	0.21	-0.12	0.00	-0.01	-0.12	3.46
Fabricated metal product manufacturing	0.24	-0.08	-0.02	0.13	0.06	-0.02	0.00	0.04	-0.18	0.07	0.02	-0.09	2.45
Machinery manufacturing	0.23	0.00	0.00	0.24	0.18	0.00	0.00	0.18	-0.06	0.00	0.00	-0.06	1.67
Computer and electronic product manufacturing	0.90	-0.02	0.03	0.91	-0.16	-0.02	0.03	-0.15	-1.06	0.00	0.00	-1.06	**29.90**
Electrical equipment, appliance and component manufacturing	0.19	0.00	0.00	0.19	-0.06	0.00	0.01	-0.06	-0.25	0.00	0.01	-0.25	6.91
Transportation equipment manufacturing	1.47	-0.13	-0.06	1.29	0.27	-0.02	0.00	0.25	-1.20	0.11	0.06	-1.04	**29.31**
Furniture and related product manufacturing	0.14	-0.10	-0.01	0.02	0.05	0.02	0.00	0.07	-0.09	0.12	0.01	0.05	-1.31
Miscellaneous manufacturing	-0.01	-0.06	-0.03	-0.09	0.10	0.00	0.00	0.10	0.10	0.06	0.03	0.19	-5.30
Sum Total	5.52	-0.66	-0.17	4.68	0.90	0.20	0.03	1.14	-4.61	0.86	0.21	-3.55	100.00

Source: These estimates have been calculated by the CSLS using unpublished Statistics Canada data.

Table 5

Contributions by Three-Digit NAICS Sub-Sector to Labour Productivity Growth between 1997-2000 and 2000-2007 Decomposed into Within-sector, Reallocation Level Effect, and Reallocation Growth Effects by Sub-Sector

	Labour Productivity				Contribution to Aggregate Labour Productivity Growth in the Sector by Sub-Sector							
					1997 to 2000				2000 to 2007			
	1997 - 2007	1997-2000	2000 - 2007	Difference between periods	Within-Sector Effect	Realloc-ation Level Effect	Realloc-ation Growth Effect	Total	Within-Sector Effect	Realloc-ation Level Effect	Realloc-ation Growth Effect	Total
	(compound annual growth rate)				(percentage points)							
	A	B	C	D	E	F	G	H	I	J	K	L
Mining and Oil and Natural Gas Extraction	-2.01	4.42	-4.65	-9.06	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Oil and gas extraction	-3.96	6.81	-8.23	-15.04	5.16	-1.10	-0.28	3.78	-5.46	2.88	-1.52	-4.11
Mining (except oil and gas extraction)	-0.61	7.42	-3.87	-11.30	1.29	0.45	0.02	1.75	-0.67	0.40	-0.13	-0.40
Support activities for mining and oil and gas extraction	-2.27	1.99	-4.04	-6.03	0.18	-1.11	-0.18	-1.11	-0.39	0.35	-0.10	-0.14
Sum Total					6.62	-1.76	-0.44	4.42	-6.52	3.63	-1.76	-4.65
Agriculture, Forestry, Fishing and Hunting	4.13	8.78	2.20	-6.58	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Crop and animal production	4.58	10.11	2.29	-7.82	7.20	0.10	-0.01	7.29	1.62	-0.02	0.00	1.60
Forestry and logging	2.98	4.94	2.15	-2.79	1.03	0.26	-0.01	1.28	0.45	-0.07	-0.01	0.37
Fishing, hunting and trapping	6.59	1.73	8.75	7.02	0.07	0.01	-0.01	0.07	0.40	0.00	-0.08	0.32
Support activities for agriculture and forestry	0.27	5.26	-1.79	-7.05	0.19	-0.01	-0.05	0.14	-0.07	-0.01	-0.02	-0.10
Sum Total					8.49	0.36	-0.07	8.78	2.41	-0.09	-0.11	2.20
Other Services	1.73	2.84	1.26	-1.58	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Repair and maintenance	2.68	3.14	2.49	-0.66	1.29	0.05	0.01	1.36	1.14	0.00	0.01	1.15
Religious, grant-making, civic, and professional and similar organizations	3.00	7.83	1.00	-6.83	0.81	0.01	0.01	0.83	0.11	-0.06	0.00	0.05
Personal and laundry services and private households	0.44	1.10	0.16	-0.94	0.53	0.08	0.05	0.66	0.07	-0.01	0.00	0.06
Sum Total					2.63	0.14	0.07	2.84	1.32	-0.06	0.00	1.26
Administration, Waste Management and Removal Services	0.32	-0.14	0.52	0.66	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Administrative and support services	-0.02	-0.16	0.04	0.20	-0.15	-0.01	0.00	-0.16	0.04	0.00	0.00	0.04
Waste management and remediation services	4.24	2.89	4.82	1.93	0.23	-0.18	-0.04	0.01	0.38	0.05	0.04	0.48
Sum Total					0.08	-0.19	-0.04	-0.14	0.42	0.05	0.04	0.52
Information and Cultural Industries	2.99	1.56	3.61	2.04	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Motion picture and sound recording industries	1.27	1.49	1.17	-0.32	0.13	0.04	0.00	0.17	0.09	0.06	0.04	0.19
Broadcasting and telecommunications	4.00	2.91	4.47	1.56	1.82	-0.07	-0.02	1.73	2.89	-0.03	-0.02	2.84
Publishing industries, information services and data processing services	1.56	-0.73	2.55	3.28	-0.21	-0.10	-0.03	-0.34	0.71	-0.09	-0.04	0.58
Sum Total					1.73	-0.13	-0.04	1.56	3.69	-0.07	-0.02	3.61
Transportation and Warehousing	0.66	1.65	0.24	-1.41	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Air, rail, water and scenic and sightseeing transportation and support activities for transportation	1.26	-0.37	1.96	2.33	-0.13	0.11	-0.02	-0.05	0.75	-0.10	-0.08	0.57
Truck transportation	0.34	2.39	-0.52	-2.91	0.62	-0.12	0.00	0.50	-0.14	-0.13	-0.02	-0.28
Transit and ground passenger transportation	1.26	4.19	0.03	-4.16	0.45	0.08	-0.02	0.51	0.00	0.01	0.00	0.02
Pipeline transportation	1.21	6.53	-0.98	-7.52	0.75	-0.60	-0.14	0.02	-0.10	0.08	-0.01	-0.02
Postal service and couriers and messengers	1.01	4.06	-0.27	-4.34	0.52	0.12	-0.02	0.62	-0.03	0.02	0.00	-0.01
Warehousing and storage	-0.26	1.44	-0.98	-2.42	0.04	0.00	0.00	0.05	-0.03	0.01	-0.01	-0.04
Sum Total					2.25	-0.41	-0.19	1.65	0.46	-0.10	-0.12	0.24
Utilities	-0.94	0.37	-1.50	-1.86	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Electric power generation, transmission and distribution	-0.97	-0.18	-1.31	-1.13	-0.16	-0.01	0.00	-0.16	-1.14	0.00	0.00	-1.13
Natural gas distribution, water and other systems	-0.71	4.35	-2.80	-7.16	0.54	-0.03	0.01	0.53	-0.37	0.01	0.00	-0.36
Sum Total					0.39	-0.03	0.02	0.37	-1.51	0.01	0.00	-1.50

Source: These estimates have been calculated by the CSLS using unpublished Statistics Canada data.

Table 5, continued

Contributions by Three-Digit NAICS Sector to Labour Productivity Growth between 1997-2000 and 2000-2007 Decomposed into Within-sector, Reallocation Level Effect, and Reallocation Growth Effect by Sector and Sub Sector

	Contribution to Labour Productivity Growth in the Sector by Sub-Sector				Contribution to the Change in Labour Productivity Growth in Canada's Market Sector between periods by Sub-Sector				Per Cent Contribution to the Slowdown in Market Sector Labour Productivity
	Difference Between 1997- 2000 and 2000 - 2007								
	Within-Sector Effect	Realloc-ation Level Effect	Realloc-ation Growth Effect	Total	Within-Sector Effect	Realloc-ation Level Effect	Realloc-ation Growth Effect	Total	
	(percentage points)								
	M = I - E	N = J - F	O = K -G	P = L - H	Q	R	S	T	U = T / -2.10
Mining and Oil and Natural Gas Extraction	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Oil and gas extraction	-10.62	3.97	-1.24	-7.88	-0.70	0.89	-0.20	-0.02	0.95
Mining (except oil and gas extraction)	-1.96	-0.04	-0.15	-2.15	-0.14	0.06	0.01	-0.07	3.33
Support activities for mining and oil and gas extraction	-0.57	1.46	0.08	0.97	-0.04	0.00	-0.01	-0.05	2.38
Sum Total	-13.14	5.39	-1.31	-9.06	-0.87	0.94	-0.20	-0.13	6.19
Agriculture, Forestry, Fishing and Hunting	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Crop and animal production	-5.58	-0.11	0.00	-5.69	-0.22	-0.10	0.02	-0.29	13.81
Forestry and logging	-0.57	-0.33	0.00	-0.91	-0.02	0.00	0.00	-0.03	1.43
Fishing, hunting and trapping	0.33	-0.01	-0.07	0.25	0.01	0.00	-0.01	0.01	-0.48
Support activities for agriculture and forestry	-0.26	0.00	0.03	-0.23	-0.01	0.00	0.00	-0.01	0.48
Sum Total	-6.08	-0.46	-0.04	-6.58	-0.24	-0.10	0.02	-0.32	15.24
Other Services	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Repair and maintenance	-0.16	-0.04	-0.01	-0.21	0.00	0.02	0.00	0.02	-0.95
Religious, grant-making, civic, and professional and similar organizations	-0.69	-0.07	-0.01	-0.78	-0.02	0.00	0.00	-0.01	0.48
Personal and laundry services and private households	-0.46	-0.08	-0.05	-0.60	-0.01	-0.03	0.00	-0.04	1.90
Sum Total	-1.31	-0.20	-0.07	-1.58	-0.03	0.00	0.00	-0.04	1.90
Administration, Waste Management and Removal Services	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Administrative and support services	0.19	0.01	0.00	0.20	0.01	0.00	0.01	0.02	-0.95
Waste management and remediation services	0.15	0.23	0.08	0.46	0.00	0.00	0.00	0.01	-0.48
Sum Total	0.34	0.24	0.08	0.66	0.01	0.01	0.01	0.03	-1.43
Information and Cultural Industries	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Motion picture and sound recording industries	-0.04	0.01	0.04	0.01	0.00	0.00	0.00	0.00	0.00
Broadcasting and telecommunications	1.08	0.04	0.00	1.11	0.06	-0.06	-0.01	-0.01	0.48
Publishing industries, information services and data processing services	0.92	0.01	-0.02	0.92	0.04	-0.01	0.01	0.04	-1.90
Sum Total	1.96	0.06	0.02	2.04	0.10	-0.07	-0.01	0.03	-1.43
Transportation and Warehousing	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Air, rail, water and scenic and sightseeing transportation and support activities for transportation	0.89	-0.21	-0.05	0.62	0.05	-0.01	0.00	0.04	-1.90
Truck transportation	-0.76	-0.01	-0.02	-0.79	-0.05	0.00	0.00	-0.05	2.38
Transit and ground passenger transportation	-0.45	-0.06	0.02	-0.49	-0.03	0.00	0.00	-0.03	1.43
Pipeline transportation	-0.85	0.68	0.13	-0.03	-0.05	0.04	0.01	0.00	0.00
Postal service and couriers and messengers	-0.55	-0.10	0.02	-0.63	-0.03	-0.01	0.00	-0.04	1.90
Warehousing and storage	-0.08	0.00	-0.01	-0.09	0.00	0.00	0.00	-0.01	0.48
Sum Total	-1.79	0.30	0.08	-1.41	-0.11	0.02	0.00	-0.09	4.29
Utilities	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Electric power generation, transmission and distribution	-0.98	0.01	0.00	-0.97	-0.03	0.12	-0.01	0.08	-3.81
Natural gas distribution, water and other systems	-0.92	0.04	-0.01	-0.89	-0.04	0.01	0.00	-0.02	0.95
Sum Total	-1.90	0.04	-0.01	-1.86	-0.07	0.13	-0.01	0.06	-2.86

Source: These estimates have been calculated by the CSLS using unpublished Statistics Canada data.