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Labour Productivity of Unincorporated Sole Proprietorships and Partnerships: Impact on the Canada–United States Productivity Gap

by John Baldwin, Danny Leung, and Luke Rispoli

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Authors' names are listed alphabetically.

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- .. not available for a specific reference period
- ... not applicable
- 0 true zero or a value rounded to zero
- 0^s value rounded to 0 (zero) where there is a meaningful distinction between true zero and the value that was rounded
- ^p preliminary
- ^r revised
- x suppressed to meet the confidentiality requirements of the [Statistics Act](#)
- E use with caution
- F too unreliable to be published
- * significantly different from reference category ($p < 0.05$)

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Abstract

This paper asks how the performance of self-employed unincorporated businesses affects the size of the gap in labour productivity between Canada and the United States. To do so, the business sector in each country is divided into unincorporated and corporate businesses, and estimates of labour productivity are generated for each sector.

The productivity performance of the unincorporated sector relative to the corporate sector is much lower in Canada than in the United States. As a result, when the unincorporated sector is removed from the estimates for the business sector in each country and only the corporate sectors for the two countries are compared, the gap in the level of productivity between Canada and the United States is reduced.

The unincorporated sector consists of both sole proprietorships and partnerships. This paper also investigates the impact of just sole proprietorships on the Canada–United States productivity gap. Sole proprietorships in the two countries more closely resemble one another than do partnerships, as U.S. partnerships are much larger than their Canadian counterparts.

When sole proprietorships are removed from the business-sector estimates of each country (allowing a comparison of sole proprietorships to the rest of the business sector, which consists of partnerships and the corporate sector), the gap in labour productivity between Canada and the United States also declines but by only about half as much as when both sole proprietorships and partnerships are removed.

The lower productivity of the unincorporated sector (both sole proprietorships and partnerships) accounted for almost the entire productivity gap between Canada and the United States in 1998. Since then, the productivity of the corporate sector in Canada has fallen relative to that of the corporate sector in the United States and the unincorporated sector no longer accounts for the entire gap.

Executive summary

This paper asks whether the gap in labour productivity between Canada and the United States is attributable in part to the performance of smaller Canadian producers of a particular type. It does so by removing the unincorporated self employed from the estimates of labour productivity in both countries so as to compare only the productivity of larger businesses.

Labour productivity is an indicator of the efficiency with which producers make use of labour in the production process. Differences in labour productivity arise from differences in the scale of production, in the amount of capital available per worker, in the skills possessed by owners, and in other organizational characteristics (including technology) possessed by firms.¹

The paper focuses on one group of small producers—the unincorporated self-employed. Unincorporated enterprises in Canada are typically smaller enterprises than those in the corporate sector and use less capital per worker. In 2005, output per hour worked in the unincorporated sector was just 63% of output per hour worked in the corporate sector. Sole proprietorships accounted for about 70% of gross domestic product (GDP) in the unincorporated sector in Canada in 2008; partnerships accounted for the remainder.

The productivity of the unincorporated sector relative to the corporate sector is much lower in Canada than in the United States. As a result, when the unincorporated sector is removed from the estimates for the business sector of each country and only the corporate sectors for the two countries are compared, differences between Canada and the United States are much lower.

The Canada–United States ratio for labour productivity in the business sector as a whole was 88.0% in 1998 while the productivity ratio for the corporate sector (after removing unincorporated businesses) was much higher, at 99.2%. From 1998 to 2005, the level of productivity of the unincorporated sector in Canada relative to the unincorporated sector in the United States remained about the same; however, the relative productivity of the corporate sector fell. By 2005, the overall Canada–United States ratio for the business sector had declined to 81%, and the productivity ratio for the corporate sector fell to 89%.

The paper also considers just the effect of removing a sub component of the unincorporated sector, namely sole proprietorships, on the Canada–United States productivity gap. The unincorporated sector consists of both sole proprietorships and partnerships. Sole proprietorships in the two countries more closely resemble one another than do partnerships, as U.S. partnerships are much larger than their Canadian counterparts.

When sole proprietorships are removed from the estimates of labour productivity in the business sector of each country (thereby permitting a Canada–United States comparison of sole proprietorships and the rest of the business sector, consisting of partnerships and the corporate sector), the gap in labour productivity between Canada and the United States of the self-employed declines. The impact of sole proprietorships on the size of the Canada–United States gap in labour productivity was around 4 percentage points in 1998. As was the case with the unincorporated sector as a whole, the productivity of sole proprietorships in Canada relative to the productivity of sole proprietorships in the United States remained steady in the period from 1998 to 2005, while the productivity of the rest of the business sector (made up of corporations and partnerships) declined. The relative contribution of sole proprietorships to the Canada–United States gap was more substantial in the 1990s; it has declined since 2000 as a gap emerged between the Canadian and U.S. corporate sectors.

1. See Baldwin *et al.* (2005) for a discussion of the determinants of differences in labour productivity.

The remainder of the difference in labour productivity between Canada and the United States in 1998 (some 5.8 percentage points) arising from the unincorporated sector is attributable to the higher productivity of U.S. partnerships. In the United States, partnerships are concentrated more heavily in the financial sector than they are in Canada.

1 Introduction

The gap between Canadian and U.S. labour productivity levels has been attributed to a number of sources—differences in the size of markets that lead to smaller Canadian firms or shorter production runs; higher prices of capital relative to labour that give rise to less capital per worker; or differences in managerial efficiency.

This paper contributes to our understanding of the importance of the first explanation—differences in size of markets. This theme has been pursued by a number of researchers (Baldwin and Gorecki 1986; Inwood and Keay 2005; Leung, Meh, and Terajima 2008).² Examination of this issue is usually approached by developing estimates of improvements in labour productivity that arise from scale economies and then by correcting for the impact of differences in firm or plant size in Canada and the United States on estimates of the relative levels of labour productivity.

This paper approaches this question in a new way. It starts by examining whether Canada has a particularly large group of a specific type of small producers and then removes this group from estimates of labour productivity in both countries. If the characteristics of the Canadian economy are what give rise to a larger Canadian share of these smaller producers,³ this technique provides a way to investigate the effect of smaller market size on the difference in the overall productivity level.

The group of small producers that is the focus of this study is the unincorporated self-employed. Unincorporated businesses differ from incorporated businesses in terms of their legal form of organization and their economic characteristics. Unincorporated businesses are typically small businesses with either an owner as the sole worker or an owner combined with a small number of employed workers. The importance of this sector in Canada increased over the period between 1980 and 2000, though it declined after 2000 (Rispoli 2009*b,c*). The labour productivity of unincorporated businesses is lower than that of corporations (Baldwin and Rispoli 2010). Succeeding sections review the importance of the unincorporated sector in Canada, namely its productivity relative to that of the corporate sector and the impact of this difference on Canadian and U.S. productivity levels.

This paper focuses on the period from 1998 to 2005, a period in which the productivity gap between Canada and the United States widened substantially. Although Canada's productivity relative to the United States continued to decline after 2005, this year is chosen as the end point because the Canadian estimates for the corporate and unincorporated sector are derived from Rispoli (2009a), and are available only up to 2005.

The comparison contained herein faces several difficulties. First, it involves comparisons of data between two countries whose statistical systems are similar but not identical. Resolution of differences requires the reconciliation of concepts and methodology. Second, it requires the division of gross domestic product (GDP) and hours worked of the total business sector into subcategories (unincorporated businesses and incorporated businesses) that are not normally estimated separately. Resolution of this problem requires the use of professional judgment when making the assumptions that are needed to separate categories into their component parts. In order to provide guidance on the accuracy of the results, the study tests the sensitivity of the results to alternate assumptions.

2. Baldwin and Gorecki (1986) and Leung *et al.* (2008) attribute about half of the difference between Canadian and U.S. manufacturing productivity to differences in size of plants. Inwood and Keay (2005) examine a longer period and find that plant size also contributes about half of the difference.

3. Explanations include, but are not limited to, the smaller size of the Canadian market.

2 Separating the business sector into corporate and unincorporated components

The analysis of productivity in this paper focuses on the business sector, where output is sold at an explicit market price and price indices are available to generate measures of the volume of output.⁴

In Canada, the business sector comprises all corporate businesses and unincorporated businesses that are organized for profit and other entities that produce goods and services for sale at a price intended at least to approximate the costs of production. Government business enterprises (GBEs) are included as part of the business sector, but the rent that is imputed to owner-occupied housing is not.⁵ In the United States, the business sector is comprised of all corporate and non-corporate businesses. The non-corporate sector in the United States resembles the unincorporated sector in Canada. Whereas GBEs are part of the corporate sector in Canada, they are part of the non-corporate sector in the United States.⁶ For consistency with the Canadian definition, U.S. GBEs are moved from the non-corporate to the corporate sector for this analysis. In this paper, the non-business sector in Canada and the United States includes government administration (referred to as general government in the United States), non-profit activity and the rent that is imputed to owner-occupied housing. Using this definition, the business sector of the Canadian economy accounted for 77.2% of total GDP in 1999, while it made up 77.5% of U.S. total GDP in the same year.

Comparisons will be made between the corporate and unincorporated sectors in Canada and the United States. The rules used to divide the business sector into these two different forms of legal organization are related to differences in tax-filing requirements for businesses.

2.1 Canadian corporate sector and unincorporated sector

The Canadian System of National Accounts classifies businesses by legal form of organization in accordance with the Canada Revenue Agency's (CRA) filing requirements for corporate businesses and filing requirements for unincorporated businesses (Table 1). A corporation is created by completing articles of incorporation and by filing them with the appropriate provincial, territorial, or federal authorities. Corporations must file a *T2 Corporation Income Tax Return*. In this paper, the output of corporations, GBEs, and income trusts are included in the corporate sector.

4. Other sectors of the domestic economy, including government, households, and institutions, are part of the non-business sector. In the non-business sector, measurement of output is difficult since output is not sold at an explicit market price. As a result, it is generally valued at the cost of its inputs. Therefore, measures of growth in the volume of output differ little from measures of the growth of inputs. This implies that estimates of productivity growth are close to zero by construction.

5. The official Canadian estimates of gross domestic product for the business sector include an imputation for the service provided by owner-occupied dwellings. This estimate is moved from the business sector to the non-business sector for this analysis since it does not fit the definition of the business sector (i.e., entities selling goods at market price) that is used here.

6. See *Concepts and Methods of the U.S. National Income and Product Accounts* (published by the Bureau of Economic Analysis, U.S. Department of Commerce).

Table 1
Legal forms of organization in Canada and the United States

| United States | Canada |
|--|---------------------------------------|
| Corporate sector | Corporate sector |
| Corporations ¹ : | Corporations |
| - C corporations | Government business enterprises |
| - S corporations | Income trusts |
| - Regulated investment companies | Partnerships: |
| - Real estate investment trusts | - Corporate member |
| - LLCs that elect to be taxed as C or S corporations | - Income trust member |
| Partnerships: | |
| - Corporate member | |
| Non-corporate sector | Unincorporated sector |
| Sole proprietorships | Sole proprietorships |
| Partnerships: | Partnerships: |
| - Individuals (non-corporate member) | - Individuals (unincorporated member) |
| Government business enterprises ² | |
| LLCs that do not elect to be taxed as C or S corporations ³ | |

Other private businesses

1. C corporations are corporations that are taxed at the entity and shareholder levels. S corporations are small closely held corporations subject to various restrictions (including a restriction on ownership). They are taxed only at the shareholder level.
2. Government business enterprises are part of the non-corporate sector in the United States. For consistency with the Canadian definition, they are moved to the corporate sector for this analysis.
3. Limited liability companies (LLCs) that elect not to be taxed as corporations are taxed as sole proprietorships when they have one member and as partnerships when they have more than one member.

Note: Some cells have been left blank because of differences between the legal forms of organization in Canada and the United States.

The Canadian System of National Accounts also includes in the corporate sector the net incomes of corporations received from some partnerships. A partnership is a legal form that straddles the unincorporated and corporate sectors; it is described by the CRA as “usually the relationship between persons who carry on a business in common with the belief that they will make a profit.”⁷ Partnerships cross both the unincorporated and corporate sectors because members of a partnership can be corporations, income trusts, other partnerships, or individuals. Members of a partnership report their share of profits on their applicable returns—*T1 General Income Tax and Benefit Return* (individuals); *T2 Corporation Income Tax Return* (corporations); and *Statement of Trust Income Allocations and Designations* (form T3) (income trusts)—and partnerships must file a *Statement of Partnership Income* (form T5013) (which details how the profits of the partnership are divided) when they have five or more members and/or a member who is a corporation.

Sole proprietorships, along with partnerships whose members are unincorporated, make up the remainder of the unincorporated sector. Sole proprietorships, namely businesses that are not incorporated and are owned by one person, file a *T1 General Income Tax and Benefit Return* (individuals).

2.2 United States corporate sector and non-corporate sector

The United States National Income and Product Accounts (NIPA) divide legal forms of organization into corporate and non-corporate businesses on the basis of Internal Revenue Service (IRS) filing requirements. Corporate businesses include all entities required to file

7. Quoted from the website of the Canada Revenue Agency: www.cra-arc.gc.ca/tx/bsnss/tpcs/sjprtnr/prtnrshp/menu-eng.html.

federal corporate tax returns, IRS Form 1120 (*U.S. Corporation Income Tax Return*) series. Corporations are subdivided into C corporations, S corporations, regulated investment companies (RICs), and real estate investment trusts (REITs).^{8,9} C Corporations are taxed at the entity level (where taxable corporate income is taxed), and at the shareholder level (where dividends are paid out). S corporations are small closely held corporations subject to various restrictions (including a restriction on ownership). The business income of S corporations, RICs, and REITs flows through to the owners, who are consequently subject to tax. In this paper, GBEs are also included in the corporate sector. They consist of government agencies that sell goods and services to the public and cover a substantial proportion of their operating costs by selling these goods and services.¹⁰

In the United States, partnerships fall under both the corporate and non-corporate sectors. Partners may be individuals, corporations, other partnerships, tax-exempt organizations, and other entities who report their allocated shares of income and expenses on their own tax returns (Luttrell *et al.* 2006). Partnerships are entities that are required to file federal partnership income tax returns, IRS Form 1065 (*U.S. Return of Partnership Income*). Partnerships may be organized as a general partnership, limited partnership, limited liability company (LLC), foreign partnership, or limited liability partnership (LLP). In addition to filing IRS Form 1065, partnerships must also provide a schedule of allocations or distributions made to each partner. As is the case in Canada, NIPA, in the United States, allocate income from partnerships to the legal form of the members of the partnership, which can be corporate or non-corporate.

Also included in the corporate sector are LLCs. Since the mid-1990s, a growing segment of businesses consist of LLCs. These entities have the limited liability of corporations, and their income and expenses flow through to their members. LLCs can be taxed as corporations, partnerships, or sole proprietorships. Conditional on their situation, LLCs can elect to be taxed as a C corporation or an S corporation (in the later case, provided that they meet the restrictions of an S corporation). In this case, these LLCs would be classified to the corporate business sector. LLCs with multiple owners are taxed as a partnership if they elect not to be taxed as a corporation (as described above). LLCs with one member may also elect to be taxed as a sole proprietorship. The latter two situations would be classified to the non-corporate business sector.

Aside from LLCs that elect to be taxed as sole proprietorships, the U.S. non-corporate sector also includes sole proprietorships, non-corporate members of partnerships, and other private businesses. Sole proprietorships include all entities that are required to file IRS *Schedule C (Profit or Loss From Business [Sole Proprietorship])* or *Schedule F (Profit or Loss From Farming)* of the owner's individual tax return (Form 1040, *U.S. Individual Income Tax Return*). This business income is passed through to the business owner, where it is subject to taxation.

Other private businesses include all entities that are (or would be) required to report either (1) rental and royalty income on IRS *Schedule E (Supplemental Income and Loss)* of the individual income tax return (Form 1040) and (2) tax-exempt cooperatives.

8. See Luttrell *et al.* (2006) for a discussion of the tax treatment of various legal forms of organization.

9. Many of the definitions in this section are taken from U.S. Bureau of Economic Analysis (2009).

10. NIPA defines these entities as part of the non-corporate sector. In Canada, GBEs are a component of corporations. For comparability, GBEs in NIPA were moved to the corporate sector from the non-corporate sector for purposes of the comparisons produced in this paper.

3 The relative importance of the unincorporated sector

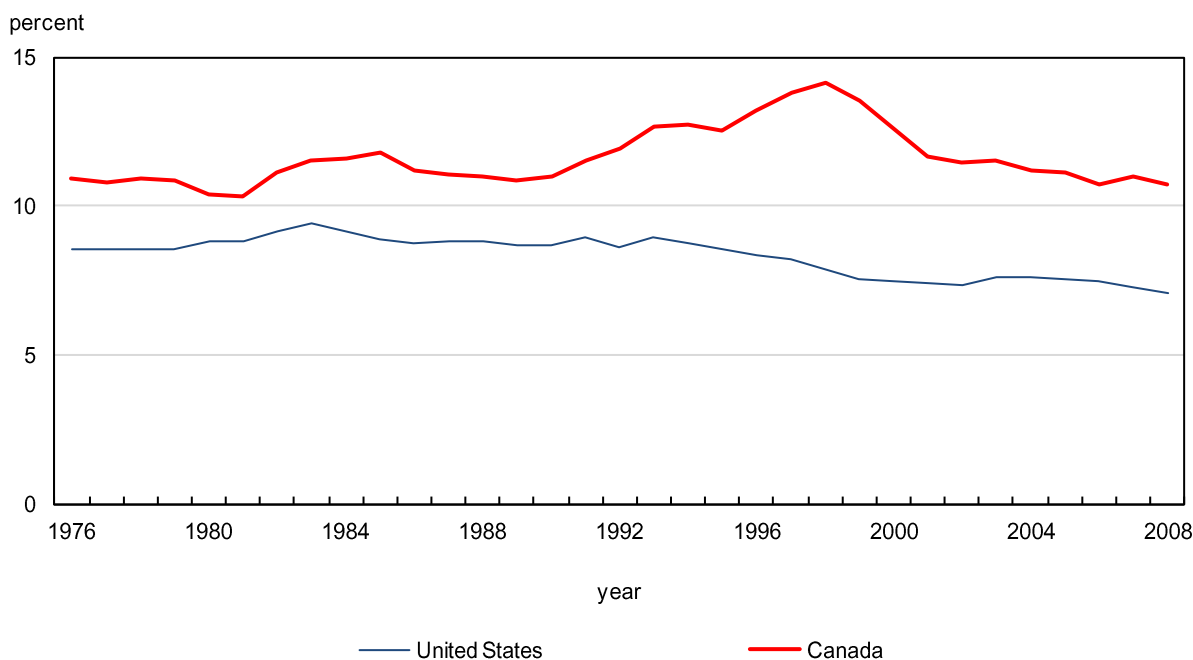
This section first compares the relative importance of the unincorporated sector in Canada and the non-corporate sector in the United States. It then examines the compositional differences within the unincorporated and non-corporate sectors in the two countries.

3.1 The Canadian unincorporated sector and the U.S. non-corporate sector

In Canada, the relative importance of self-employed owners in the unincorporated sector increased during the 1980s and 1990s (Chart 1). The share of total employment accounted for by unincorporated self-employed entrepreneurs increased over the two decades—peaking at 14% in 1998, well above the 11% seen during the 1980s. However, during the post-2000 period, this share has fallen back to that observed during the early 1980s.

In the United States, the employment share of non-corporate self-employed entrepreneurs was around 9% of total employment throughout the late 1980s to the mid-1990s and declined to 7% in 2008.¹¹

Chart 1
Unincorporated/non-corporate self-employed share of total employment (owners only)



Sources: Labour Force Survey; and Bureau of Economic Analysis.

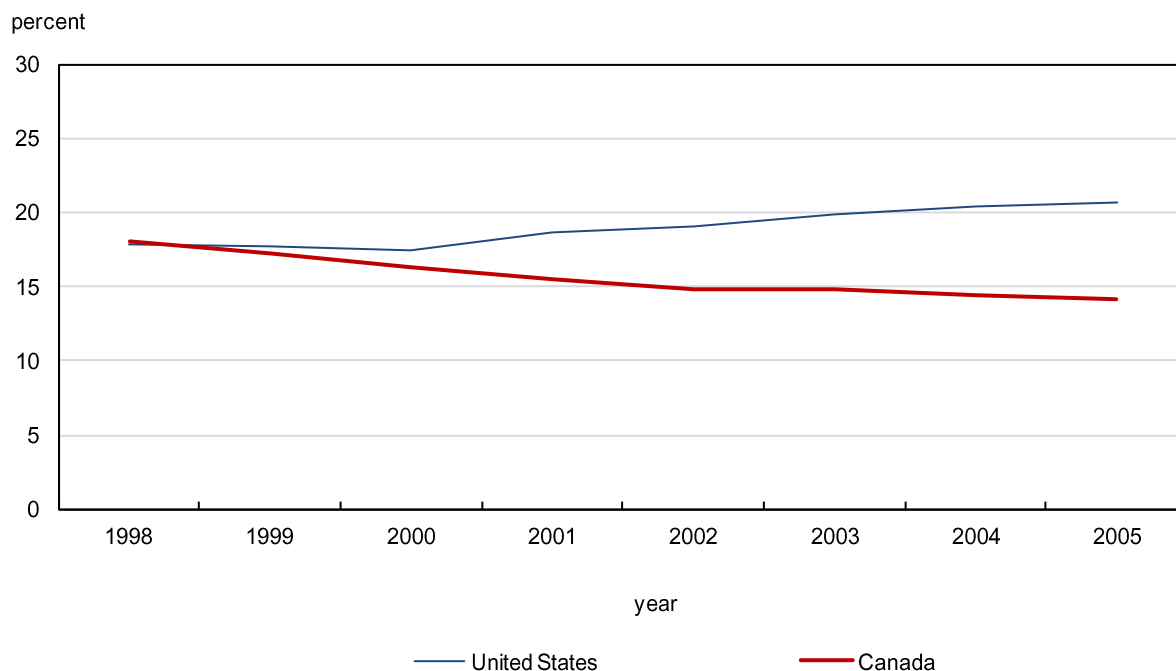
When owners are considered by themselves, Canada has a larger percentage of employment in the unincorporated sector. However, many unincorporated businesses hire employees. An assessment of the overall importance of the unincorporated sector in terms of overall persons employed needs to take into account both the owners of unincorporated businesses and their paid employees. When both groups are added together, the U.S. non-corporate sector exceeds Canada's unincorporated sector in terms of relative importance. While the unincorporated sector

11. The source for the U.S. data is the Bureau of Economic Analysis, U.S. Department of Commerce.

accounted for about the same percentage of total hours worked (18%) in both countries in the late 1990s, its share fell to less than 14% in Canada by 2005 while it increased marginally in the United States to over 20% by the same year (Chart 2).

The non-corporate sector of the United States is slightly less important than the Canadian unincorporated sector when only the owners of these enterprises are examined, but is more important when total hours worked by owners and paid workers are compared. This occurs because the U.S. non-corporate sector hires relatively more paid workers than does the Canadian unincorporated sector.

Chart 2
Share of hours worked in the unincorporated/non-corporate sector



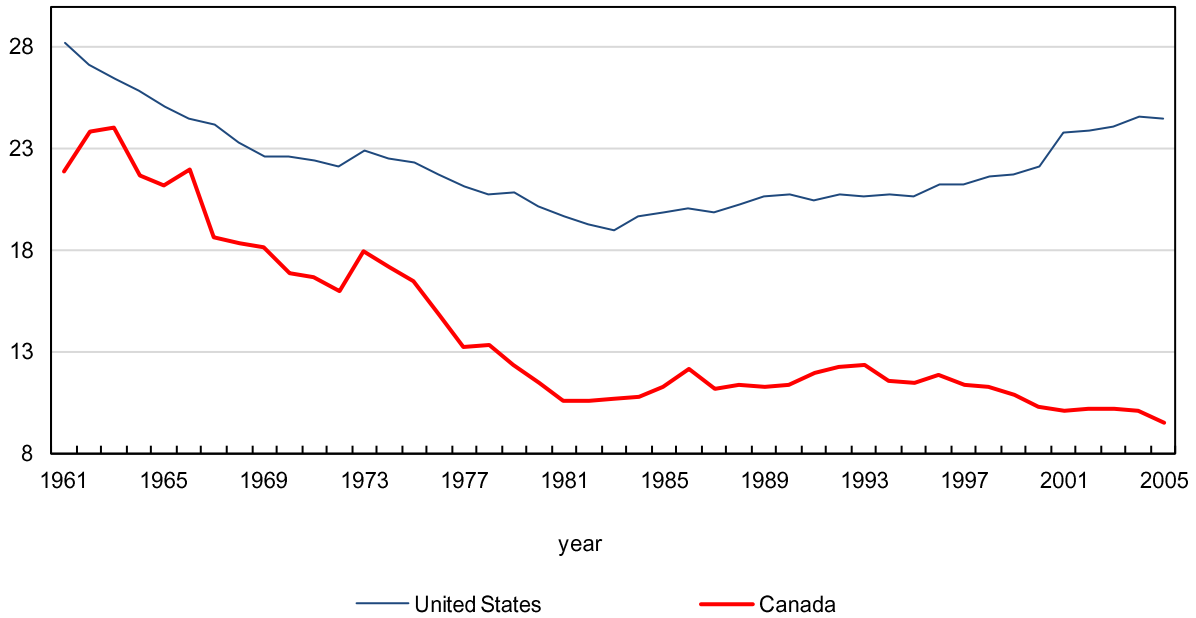
Source: See Section 4.2.

Comparisons that use the share of GDP of unincorporated businesses as a percentage of business-sector GDP show the non-corporate sector of the United States to be even more important (Chart 3). The share in both countries was very high during the 1960s. The U.S. share stood at 28% in 1961, and the Canadian share peaked at 23% in 1963. Between the 1960s and the late 1980s, the share in both countries declined. Subsequently, the U.S. share increased—from 20.0% in 1986 to 23.7% in 2005—while the share in Canada declined from 11.2% in 1986 to 9.5% in 2005.

Chart 3

Share of unincorporated/non-corporate-sector gross domestic product to business-sector gross domestic product

percent

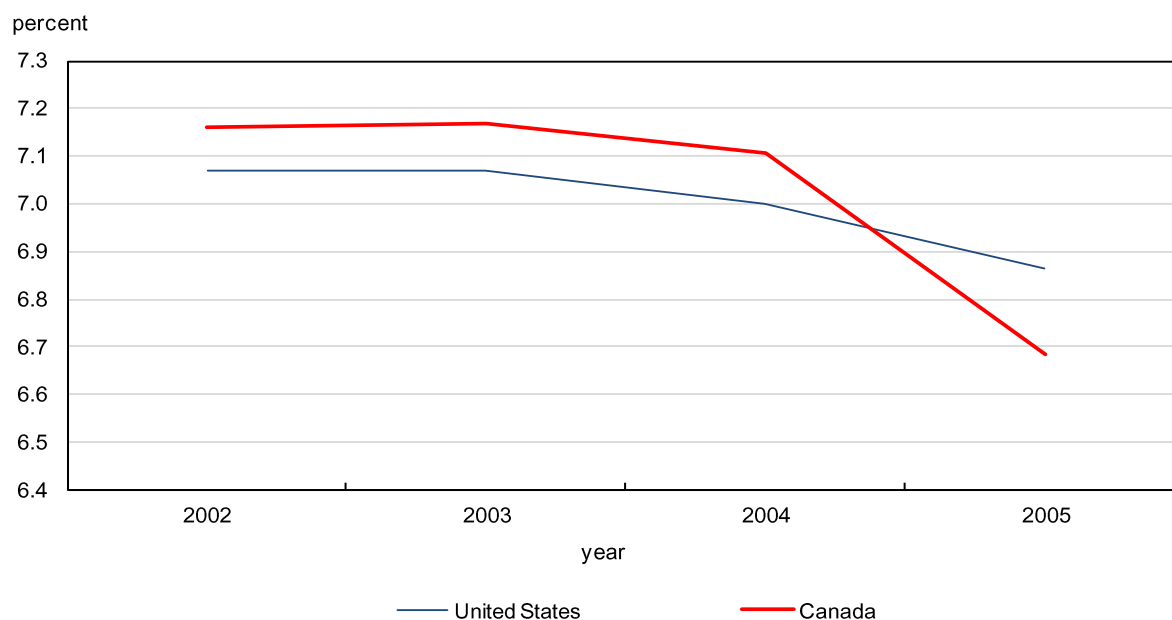


Sources: The unincorporated-sector gross domestic product and the business-sector gross domestic product for Canada for the years from 1987 to 2005 are derived from Rispoli (2009c). The unincorporated-sector gross domestic product for the years from 1961 to 1987 was based on growth rates of mixed income, excluding owner-occupied dwellings. The U.S. non-corporate gross domestic product is based on Bureau of Economic Analysis Table 1.13.

3.2 Separating the unincorporated/non-corporate sector into sole proprietorships and partnerships

The unincorporated sector consists of two main groups—sole proprietorships and the unincorporated members of partnerships. The relative importance of each group differs between Canada and United States (Chart 4). In Canada, sole proprietorships generated about 70% of unincorporated GDP in 2008, while partnerships generated the rest.¹² In the United States, sole proprietorships produced only 29% of non-corporate GDP in 2005, while partnerships generated the remainder.¹³

Chart 4
Share of gross domestic product for sole proprietorships to gross domestic product for the business sector



Note: Sole proprietorships and partnerships have quite different characteristics. Sole proprietorships tend to be small businesses, while partnerships are much more likely to be larger.
Source: Authors' own calculations. See Section 5.1 and footnote 12.

12. The estimate of sole proprietorships and partnerships for Canada was based on the aggregation of GDP items (labour income, interest payments, taxes paid, depreciation, and net income) from the redesigned T1 (*T1 General Income Tax and Benefit Return*) 2008 tax data for unincorporated enterprises. The redesign involved separating enterprises, as provided in the 2008 T1 tax returns, into sole proprietorships and partnerships. A database on partnerships was developed, which linked the individual T1 enterprises involved in partnerships to other partnerships by means of Form T5013 (*Statement of Partnership Income*) information or other partnership information reported on T1 tax returns. At present, these data are not available for years prior to 2008. As a consequence, in this paper, sole proprietorships and partnerships are assigned shares for years prior to 2008 on the basis of 2008 shares. For the period from 2002 to 2005, labour income with respect to sole proprietorships was drawn from T4 (*Statement of Remuneration Paid*) data. Sole-proprietorship GDP for the years 2002 to 2005 was generated by first estimating labour income from T4 data for the entire period and then applying the 2008 shares (excluding labour income) from the T1 tax returns to the unincorporated GDP (excluding labour income) for the period.
13. The division of U.S. GDP for the unincorporated sector into the parts generated by sole proprietorships and partnerships was based on the aggregation of GDP items (labour income, interest payments, depreciation, taxes paid, and net income) from Internal Revenue Service (IRS) Table 10 (*Nonfarm Sole Proprietorship Returns: Selected Income Statement Items*) and Table 11 (*Partnership Returns: Selected Balance Sheet and Income Statement Items*).

When the GDP from partnerships is removed from the unincorporated share of (non-corporate) GDP in both countries, the relative importance of sole proprietorships in Canada and the United States (measured as the ratio of GDP in sole proprietorships to business-sector GDP) is quite similar.

The overall differences in the unincorporated share of GDP (Chart 3) are therefore due to the partnership sector, which is more important in the United States. Canada and the United States differ with respect to the industrial sectors where partnerships are found (Table 2). In the United States, non-corporate partnerships are heavily concentrated in finance (financial investments and real estate activity) and professional services.¹⁴ In Canada, partnership activity is found in areas traditionally associated with the unincorporated sector—real estate (lessors of real estate), professional services, health care, agriculture, forestry, fishing and hunting, and construction. It is not as heavily concentrated in finance as it is in the United States.

Table 2
Industry structure of Canadian unincorporated and U.S.
non-corporate partnerships (in terms of net income) for 2008

| | United States | Canada | Difference |
|---|---------------|--------------|-------------------|
| | percent | | percentage points |
| Professional, scientific and technical services | 26.4 | 38.4 | -12.0 |
| Finance ¹ | 56.8 | 20.7 | 36.1 |
| Finance and insurance | 38.0 | 0.6 | 37.3 |
| Real estate and rental and leasing | 18.9 | 20.1 | -1.2 |
| Health care and social assistance | 5.7 | 9.6 | -4.0 |
| Agriculture, forestry, fishing and hunting | 0.5 | 8.1 | -7.6 |
| Construction | 0.5 | 6.6 | -6.0 |
| Administrative and support, waste management and remediation services | 1.2 | 4.4 | -3.2 |
| Retail trade | 1.0 | 4.1 | -3.1 |
| Transportation and warehousing | 0.3 | 2.4 | -2.0 |
| Other services (except public administration) | 0.0 | 1.8 | -1.8 |
| Accommodation and food services | -1.9 | 0.9 | -2.8 |
| Manufacturing | -0.7 | 0.8 | -1.5 |
| Arts, entertainment and recreation | -0.5 | 0.8 | -1.3 |
| Wholesale trade | 2.0 | 0.7 | 1.3 |
| Information and cultural industries | 3.5 | 0.4 | 3.1 |
| Educational services | 0.1 | 0.2 | -0.1 |
| Mining, quarrying, and oil and gas extraction | 4.7 | 0.2 | 4.5 |
| Utilities | 0.3 | 0.0 | 0.3 |
| Total | 100.0 | 100.0 | ... |

1. The net income for Finance is the sum of the net income for the Finance and insurance, and Real estate and rental and leasing industries.

Note: Numbers may not add up because of rounding.

Sources: Statistics Canada, 2008 T1 Tax Declaration File; and Internal Revenue Service, Table 5, Partnership with income allocated to partners.

14. The IRS defines financial investments as securities, commodity contracts, and other financial investments and related activities.

4 Methodological issues

Labour productivity is an indicator of the efficiency with which the economy uses labour in producing goods and services. Labour productivity will be higher in sectors where workers have more capital and where firms exploit economies of scale, employ more skilled workers, or use more advanced technologies.

Labour productivity is defined here as output [OUTPUT] per unit of labour input [L]. Output is measured by GDP calculated at market prices, and labour input is measured by hours worked. Differences in labour productivity between Canada and the United States are examined over the period 1998 to 2005.

Relative labour productivity is defined as the ratio of Canadian labour productivity (CAN LP) to U.S. labour productivity (U.S. LP).

$$\text{Relative LP}(i) \text{ CAN-US} = \text{CAN LP}(i) / \text{U.S. LP}(i) \quad (1)$$

$$\text{CAN LP}(i) = \text{CAN OUTPUT}(i) / \text{CAN L}(i) \quad (2)$$

$$\text{U.S. LP}(i) = \text{U.S. OUTPUT}(i) / \text{U.S. L}(i) \quad (3)$$

where *(i)* is the business sector, unincorporated sector (non-corporate sector in the United States), sole proprietorships, or rest of business sector.

The methods and the data sources used to estimate the Canada–United States relative levels of output and labour input that enter into the formula for relative LP (Equation 1) and the relative prices that are used to transform estimates of relative dollar values of GDP into measures of relative volume of output are discussed in the remainder of the section.

4.1 Output

In this paper, business-sector GDP in both countries is measured at market prices.¹⁵ In Canada, official business-sector GDP is valued at basic prices and is adjusted in this paper to reflect market prices. The official estimates for the United States are valued at market prices.

In order to transform Canadian GDP calculated using basic prices to a measure based on market prices, taxes on products less subsidies were added to the estimate that uses basic prices. For this purpose, an estimate was obtained from Statistics Canada's Income and Expenditure Accounts Division that allocated about 90% of the taxes on products less subsidies to the business sector.

The estimates for the corporate and unincorporated sectors were derived from the basic-price estimates in Rispoli (2009a), and then transformed to market prices by allocating total taxes on products less subsidies to each sector based on the proportion of each sector's GDP, measured at basic prices. The estimates for sole proprietorships were based on the 2008 T1 File (*T1 General Income Tax and Benefit Return*), which contained data on sole proprietorships and

15. Comparisons at basic prices were also carried out. The official U.S. estimates (valued at market prices) were adjusted to a basic price. Indirect taxes and subsidies on products and production were adjusted by keeping only indirect taxes on production. The required data for this exercise were obtained from BEA *Table 900, Detailed Tax and Social Contribution Receipts by Type of Tax or Social Contribution and Receiving Subsector*. The BEA does not produce estimates at basic prices. The conclusions derived using basic prices are not substantially different from the ones presented in this paper using market prices.

partnerships. The labour income portion for sole proprietorships was obtained from T4 (*Statement of Remuneration Paid*) data (see footnote 12).

For the United States, the estimates of National Income for the corporate and non-corporate sectors were taken from U.S. Bureau of Economic Analysis (BEA) Table 1.13 (*Net National Income by Sector, Legal Form of Organization, and Type of Income*). To move the National Income concept to a GDP concept, several adjustments were performed using the BEA Table 1.7.5 (*Relationship of Gross Domestic Product, Gross National Product, Net National Product, National Income, and Personal Income*). The difference between the two consists almost entirely of the consumption of fixed capital, a figure which was obtained from BEA Table 6.22D (*Corporate Capital Consumption Allowances by Industry*) and BEA Table 7.5 (*Consumption of Fixed Capital by Legal Form of Organization and Type of Income*). This estimate was added to the net National Income value. Any other difference between total GDP calculated at market prices and the National Income estimate (very small, averaging 2.4% of GDP from 1998 to 2005) was allocated to each sector on the basis of its share of National Income.

The estimate of GDP for sole proprietorships was based on IRS Table 10 (*Nonfarm Sole Proprietorship Returns: Selected Income Statement Items*) and IRS Table 11 (*Partnership Returns: Selected Balance Sheet and Income Statement Items*).¹⁶ This estimate was then used to calculate GDP for sole proprietorships and partnerships and to split the non-corporate component.¹⁷

4.2 Labour input

Labour input in this paper is measured as hours worked. The methodology and the data sources used in official productivity programs of Canada and the United States to estimate hours worked are not exactly the same. If the official estimates of the productivity programs of each country were used to compare Canadian and U.S. labour productivity, estimates of Canadian productivity would be biased downwards relative to those of the United States (Baldwin *et al.* 2005).

In order to avoid this bias, the benchmark (1999) estimate in Baldwin *et al.* (2005) of hours worked in the business sectors of Canada and United States is used in this paper. Baldwin *et al.* calculated the hours worked in the U.S. business sector by means of the same methodology used in Canada. For this paper, the 1999 estimate was updated to 2002 and then extrapolated up to 2005 using the official U.S. estimates for the entire business sector.

The next two subsections discuss the methodology used to estimate the labour input of the Canadian and United States business sectors from 1998 to 2005 and describe how the business sector is divided into the corporate and unincorporated sectors (non-corporate in the United States). The business sector is also divided into sole proprietorships and the rest of the business sector (including partnerships and corporations).

16. IRS Table 10 includes animal production but excludes crop production. In order to make IRS Table 11 consistent with IRS Table 10, non-farm industry totals for partnerships that exclude crop production were used.

17. The net income (loss) obtained from IRS Tables 10 and 11 represented about 95% of the net income (less loss) of non-farm proprietorships and partnerships (plus payments to partners) obtained from the IRS as reported in BEA National Economic Accounts Table 7.14. *Relation of Nonfarm Proprietors' Income in the National Income and Product Accounts to Corresponding Measures as Published by the Internal Revenue Service.*

4.2.1 Methodology for deriving Canadian labour input

Statistics Canada uses hours worked to measure the volume of labour input in its productivity estimates. For this paper, the series for total business-sector hours worked were obtained from the Productivity Program of Statistics Canada.

The series for hours worked is then split between the unincorporated and corporate sectors (Table 3). For unincorporated enterprises, hours worked are made up of the hours of self-employed owners who work for themselves and the hours of those who work for owners as paid employees. Data on hours worked for self-employed owners are obtained directly from Statistics Canada's Labour Productivity Program (LPP) using the component defined as the self-employed working owners of unincorporated farms, businesses, or professional practices. Hours worked of employees of the self-employed are derived from their wage bill by assuming that wages per employee in the unincorporated sector are the same as those for employees in general. The two components (self-employed and paid workers of the unincorporated enterprises) were added together in order to arrive at the hours worked for the unincorporated sector.¹⁸

The estimate of hours worked for the incorporated sector includes the hours of both self-employed owners of corporations and paid employees of corporations. The incorporated sector is derived from total hours worked in the business sector minus the estimate of the unincorporated sector.

The series for hours worked was also split between sole proprietorships and "the rest of the business sector." For sole proprietorships, hours worked are made up of the hours of sole proprietors who work for themselves and the hours of those who work as paid employees for these owners. The proportion of the number of sole proprietors to partnerships (obtained from the 2008 T1 File) was applied to the data on hours worked of self-employed owners. This assumes that owners of sole proprietorships work the same hours as owners of partnerships and that there is one working owner in the partnership.¹⁹

18. Since unincorporated enterprises are smaller, they likely pay less per hour than do corporations. Therefore, the share of labour income may underestimate the hours worked in the unincorporated sector and overstate labour productivity in this sector relative to the corporate sector.

19. Using mixed income to separate self-employed hours worked by sole proprietorships and self-employed hours worked by partnerships would give slightly lower hours worked for sole proprietorships (about 1.0% to 3.5% lower from 1998 to 2005). Using mixed income to split hours worked assumes that owners of sole proprietorships earn about the same net income per hour as partners in partnerships. However, sole proprietorships are generally much smaller than partnerships and generate most of the sole-proprietorship GDP. Larger partnerships, on the other hand, generated most of the partnership GDP. Consequently, sole proprietorships likely earn less per hour than the partners in partnerships. Therefore, using mixed income to split hours worked may underestimate hours worked in sole proprietorships and overstate the latter's labour productivity.

The hours worked for the paid employees of sole proprietorships were obtained by splitting the hours worked of the paid employees of the self-employed on the basis of wage bills of sole proprietorships and of the business sector (obtained from T4 data) for the period 2001 to 2005. The two components (hours worked for sole proprietors and hours worked for paid workers of sole proprietorships) were added together in order to arrive at the hours worked for sole proprietorships.²⁰

Table 3
Estimating hours worked in Canada, 1998 to 2005

| | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 |
|-------------------------|-------------------|--------|--------|--------|--------|--------|--------|--------|
| | millions of hours | | | | | | | |
| Unincorporated | 3,755 | 3,717 | 3,600 | 3,431 | 3,342 | 3,371 | 3,381 | 3,338 |
| Self-employed | 3,085 | 3,040 | 2,928 | 2,782 | 2,724 | 2,773 | 2,791 | 2,759 |
| Paid workers | 669 | 677 | 672 | 649 | 618 | 598 | 590 | 579 |
| Corporate | 17,047 | 17,745 | 18,398 | 18,654 | 19,098 | 19,339 | 20,018 | 20,249 |
| Business sector | 20,801 | 21,461 | 21,997 | 22,085 | 22,441 | 22,711 | 23,399 | 23,587 |
| Sole proprietorships | 2,993 | 2,961 | 2,861 | 2,731 | 2,682 | 2,716 | 2,739 | 2,708 |
| Self-employed | 2,702 | 2,662 | 2,564 | 2,436 | 2,386 | 2,428 | 2,444 | 2,416 |
| Paid workers | 291 | 300 | 297 | 295 | 297 | 288 | 295 | 292 |
| Rest of business sector | 17,808 | 18,500 | 19,136 | 19,353 | 19,758 | 19,994 | 20,659 | 20,879 |
| Business sector | 20,801 | 21,461 | 21,997 | 22,085 | 22,441 | 22,711 | 23,399 | 23,587 |

Note: Numbers may not add up because of rounding.

Sources: Statistics Canada, Labour Productivity Program, T4 File and authors' own calculations.

The estimate of hours worked for the rest of the business sector includes the hours worked of both self-employed owners of partnerships and corporations and their paid employees. This estimate is derived from total hours worked in the business sector minus the estimate for sole proprietorships.

4.2.2 Methodology for deriving United States labour input

The measurement issues that have to be solved in deriving a comparable estimate of hours worked for the United States and Canada are discussed in Baldwin *et al.* (2005). The official estimates of hours worked for the productivity programs of the two countries do not follow the same methodology or use the same data sources. Canada uses a household survey; the United States mainly uses an employer survey. Canada corrects for holidays that occur during a reference week; the United States does not.

Baldwin *et al.* (2005) derive a comparable estimate of hours worked that can be applied to comparisons between Canada and the United States by estimating average hours worked from a labour force survey for both countries. A similar methodology is used here to extrapolate the estimate of hours worked from the week of the household survey to other weeks in the month—by taking into account holidays, both those that occur during the week of the survey and those that occur during other weeks in the month. The estimates of average hours worked per job along with estimates of the number of jobs drawn from an employer survey in both countries provide the benchmark for business-sector hours worked for 1999 that is used in Table 4.

20. An alternative method to using the wage bill for estimating Canadian hours worked is presented in Section 7. Instead of employee hours worked in sole proprietorships being estimated by means of labour shares, employment was arrived at by means of an estimate based on employment figures obtained from the Survey of Employment, Payrolls and Hours (SEPH) (Economic Analysis Division of Statistics Canada). However, data are not available on employment of sole proprietorships for prior years; the growth in the number of T4 slips issued to employees of sole proprietorships was used instead. Hours worked for sole proprietorships were derived by applying these ratios to the business-sector hours worked, as shown in Table 3.

Table 4
Estimating hours worked in the United States, non-corporate and corporate sectors, 1998 to 2005

| | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 |
|---|-------------------|---------|---------|---------|---------|---------|---------|---------|
| | millions of hours | | | | | | | |
| Benchmark | | | | | | | | |
| Business sector | 220,260 | 224,357 | 229,561 | 225,963 | 221,270 | ... | ... | ... |
| Non-corporate self-employed owners | 21,354 | 21,053 | 20,807 | 20,354 | 19,750 | 20,511 | 20,781 | ... |
| Extrapolation indicators | | | | | | | | |
| Bureau of labor statistics business-sector hours worked | 193,919 | 197,785 | 199,930 | 195,544 | 190,783 | 189,394 | 191,628 | 194,768 |
| Bureau of labor statistics self-employed hours worked | 21,768 | 21,488 | 21,105 | 20,559 | 20,001 | 20,548 | 20,718 | 20,826 |
| Estimates | | | | | | | | |
| Business sector | 220,260 | 224,357 | 229,561 | 225,963 | 221,270 | 219,659 | 222,250 | 225,892 |
| Non-corporate self-employed owners | 21,354 | 21,053 | 20,807 | 20,354 | 19,750 | 20,511 | 20,781 | 20,881 |
| Paid workers | 198,906 | 203,303 | 208,754 | 205,609 | 201,520 | 199,148 | 201,469 | 205,011 |
| Hours, non-corporate | 38,639 | 39,083 | 39,252 | 41,301 | 41,513 | 42,956 | 44,709 | 45,999 |
| Self-employed owners | 21,354 | 21,053 | 20,807 | 20,354 | 19,750 | 20,511 | 20,781 | 20,881 |
| Paid workers of self-employed | 17,284 | 18,030 | 18,445 | 20,947 | 21,763 | 22,446 | 23,928 | 25,118 |
| Hours, sole proprietorships | 21,343 | 20,906 | 20,717 | 20,291 | 19,909 | 20,579 | 21,073 | 21,148 |
| Self-employed owners | 17,099 | 16,858 | 16,661 | 16,298 | 15,815 | 16,424 | 16,701 | 16,759 |
| Paid workers of self-employed | 4,244 | 4,048 | 4,056 | 3,993 | 4,095 | 4,155 | 4,372 | 4,389 |

Note: Numbers may not add up because of rounding.

Sources: Statistics Canada, Labour Productivity Program; Bureau of Labor Statistics (special tabulation of hours worked for self-employed and for business sector); Bureau of Economic Analysis, Table 1.13; and Internal Revenue Service, Tables 2, 10, 11, and 12.

Hours-worked data in the business sector and from self-employment were obtained from a special tabulation carried out by Statistics Canada's LPP to produce U.S. data that conform to the Canadian methodology. The business-sector data were updated by the LPP for the period 1998 to 2002, while the self-employment data were updated for the period 1998 to 2004. These business-sector data were extrapolated for the years 2003 to 2005, while hours worked for the non-corporate self-employed were extrapolated for 2005. Official U.S. estimates of hours worked in the business sector and hours worked by the non-corporate self-employed from the Bureau of Labor Statistics (BLS) were used for the extrapolations.

The series on hours worked is estimated for both the non-corporate and corporate sectors.

For the non-corporate sector, hours worked consist of the hours of self-employed owners (individuals who work for themselves) and the hours of those who work for owners as paid employees. Hours-worked data for self-employed owners are derived from a special tabulation (see previous paragraph). Hours worked of employees of the self-employed are derived from their wage bill by assuming that wages per employee in the non-corporate sector are the same as those for employees in general.

The estimate of hours worked for the corporate sector includes both self-employed owners of corporations and paid employees of corporations. The corporate sector was derived residually by subtracting the estimate of hours worked for the entire business sector from the hours worked for the non-corporate sector.

Hours-worked data for the sole proprietors who work for themselves are obtained by separating the self-employed data of non-corporate enterprises into sole proprietors and partnerships (Table 4). This was done by using the share of the number of sole proprietorships and partnerships which came from IRS Table 10 (*Nonfarm Sole Proprietorship Returns: Selected Income Statement Items*) and IRS Table 11 (*Partnership Returns: Selected Balance Sheet and Income Statement Items*).²¹ This assumes that all owners of sole proprietorships work the same hours as owners of partnerships and also that there is only one working owner in the partnership.²² Hours worked of employees of sole proprietorships are derived from the wage bills of sole proprietorships and the wage bill of the business sector. This assumes that wages per employee for sole proprietorships are the same as for employees in the business sector in general.²³

21. IRS Tables 10 and 11 include both corporate and non-corporate partnerships. IRS (*Estimated Data Line Counts Individual Income Tax Returns* [Part II: Income or Loss From Partnerships and S Corporations] from IRS *Schedule E* [Form 1040] [*Supplemental Income and Loss*]) provide the number of non-corporate partners for the period from 2003 to 2005. This information was used along with data on the number of sole proprietorships from IRS Table 10 in order to obtain the share of sole proprietorships in the non-corporate sector.

22. When mixed income is used to separate self-employed hours worked between sole proprietorships and partnerships, a much lower estimate for the period from 1998 to 2005 is produced with respect to hours worked for sole proprietorships—ranging from 36% to 68% depending on the year. This assumes that net income of sole proprietorships is the same as that of owners of partnerships. However, sole proprietorships are generally much smaller than partnerships: they generated most of their GDP from smaller-sized enterprises while, in the case of partnerships, most of the GDP came from larger partnerships. Consequently, sole proprietorships likely earn less per hour than do partnerships. As a result, using the share of mixed income may underestimate the hours worked in sole proprietorships and overstate the latter's labour productivity.

23. An alternative to using the wage bill for estimating U.S. hours worked is presented in Section 7. Instead of using labour shares of sole proprietorships to estimate employee hours worked in this group of businesses, employment figures from the 2002 and 2007 Statistics of U.S. Businesses (U.S. Census Bureau) were used. Figures for the 2003-to-2006 period were estimated by means of straight-line interpolation. Hours worked for sole proprietorships were derived by applying these ratios to the business-sector hours worked, as shown in Table 4.

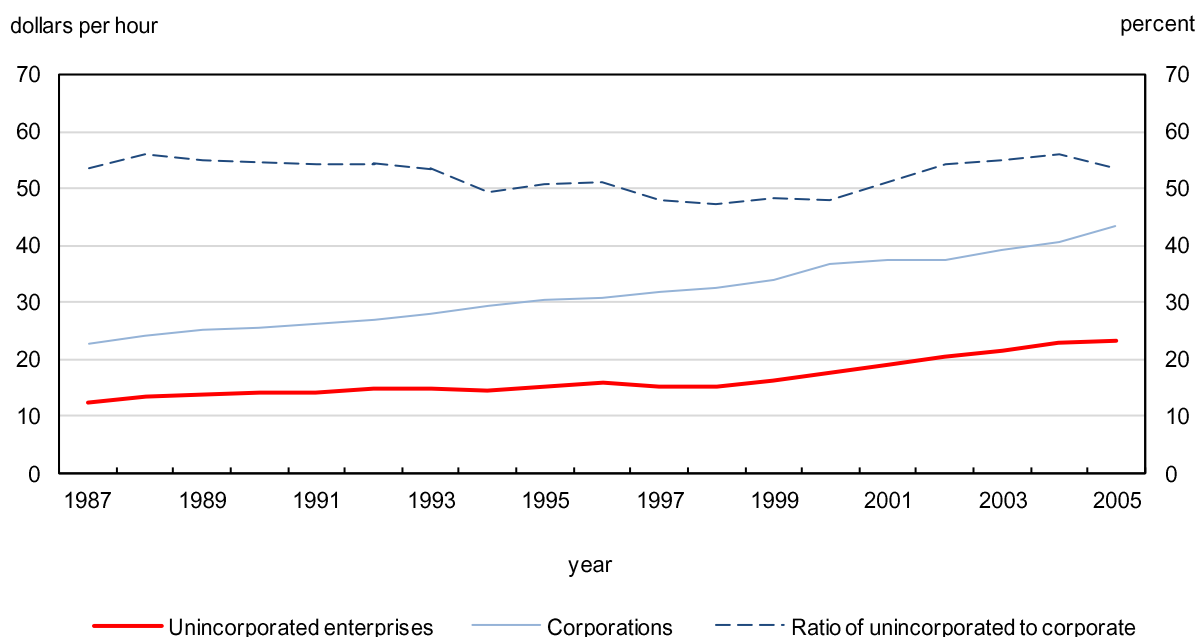
The estimate of hours worked for the rest of the business sector includes the remaining non-corporate sector (i.e., partnerships) and the corporate sector. This estimate was obtained residually by subtracting hours worked of sole proprietorships from hours worked in the business sector.

5 Productivity by legal form of organization

5.1 Canadian labour productivity

In Canada, businesses in the corporate sector are larger and more capital-intensive than those in the unincorporated sector. Unincorporated businesses are mainly small and operated by self-employed owners with no or few staff. The level of productivity, as measured by nominal GDP per hour worked, was much larger for corporations (\$47.9) than for unincorporated enterprises (\$30.6) in 2005 (Table 5). A gap in the level of labour productivity between the unincorporated sector and the incorporated sector existed over the entire 1987-to-2005 period (Chart 5).

Chart 5
Labour productivity of the Canadian unincorporated and corporate sectors



Source: Baldwin and Rispoli (2010).

The difference in productivity levels between the unincorporated sector and the corporate sector is much more pronounced for goods-producing industries than for services industries (Baldwin and Rispoli 2010). In 2005, labour productivity in the unincorporated sector of goods-producing industries was 34% of the level of productivity in the corporate sector—\$21.5 per hour for unincorporated enterprises compared to \$63.0 per hour for corporations. In the services sector, the differences were smaller; labour productivity of the unincorporated sector approached 70% of the corporate productivity level in 2005. Labour productivity was \$23.9 per hour for unincorporated firms versus \$34.1 per hour for corporations in 2005.²⁴

24. These do not correspond to estimates in Baldwin and Rispoli (2010), which exclude lessors of real estate. Both the Canadian and the U.S. GDP estimates used here include lessors of real estate because these could not be removed from the U.S. data.

Table 5
Gross domestic product, hours worked, and labour productivity for the unincorporated, corporate, and business sectors in Canada, 1998 to 2005

| | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | Average annual growth, 1998 to 2005 |
|---|-------------------------|---------|---------|---------|---------|---------|-----------|-----------|-------------------------------------|
| | millions of dollars | | | | | | | | percent |
| Gross domestic product at market prices | | | | | | | | | |
| Unincorporated | 79,811 | 83,608 | 86,837 | 88,298 | 92,165 | 96,921 | 102,083 | 102,229 | 3.6 |
| Corporate | 619,894 | 675,739 | 753,879 | 773,453 | 800,285 | 841,064 | 902,137 | 970,230 | 6.6 |
| Business sector | 699,705 | 759,347 | 840,716 | 861,751 | 892,450 | 937,985 | 1,004,220 | 1,072,459 | 6.3 |
| | millions of hours | | | | | | | | percent |
| Hours worked | | | | | | | | | |
| Unincorporated | 3,755 | 3,717 | 3,600 | 3,431 | 3,342 | 3,371 | 3,381 | 3,338 | -1.7 |
| Corporate | 17,047 | 17,745 | 18,398 | 18,654 | 19,098 | 19,339 | 20,018 | 20,249 | 2.5 |
| Business sector | 20,801 | 21,461 | 21,997 | 22,085 | 22,441 | 22,711 | 23,399 | 23,587 | 1.8 |
| | dollars per hour worked | | | | | | | | percent |
| Labour productivity | | | | | | | | | |
| Unincorporated | 21.3 | 22.5 | 24.1 | 25.7 | 27.6 | 28.7 | 30.2 | 30.6 | 5.4 |
| Corporate | 36.4 | 38.1 | 41.0 | 41.5 | 41.9 | 43.5 | 45.1 | 47.9 | 4.0 |
| Business sector | 33.6 | 35.4 | 38.2 | 39.0 | 39.8 | 41.3 | 42.9 | 45.5 | 4.4 |

Note: Numbers may not add up because of rounding.
Source: Statistics Canada, authors' calculations.

Table 6
Gross domestic product, hours worked, and labour productivity for sole proprietorships and the rest of the business sector in Canada, 1998 to 2005

| | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | Average annual growth, 1998 to 2005 |
|---|-------------------------|---------|---------|---------|---------|---------|-----------|-----------|-------------------------------------|
| | millions of dollars | | | | | | | | percent |
| Gross domestic product at market prices | | | | | | | | | |
| Sole proprietorships | 55,396 | 57,979 | 60,114 | 61,427 | 63,900 | 67,229 | 71,353 | 71,687 | 3.8 |
| Rest of business sector | 644,309 | 701,368 | 780,602 | 800,324 | 828,550 | 870,756 | 932,867 | 1,000,772 | 6.5 |
| Business sector | 699,705 | 759,347 | 840,716 | 861,751 | 892,450 | 937,985 | 1,004,220 | 1,072,459 | 6.3 |
| | millions of hours | | | | | | | | percent |
| Hours worked | | | | | | | | | |
| Sole proprietorships | 2,993 | 2,961 | 2,861 | 2,731 | 2,682 | 2,716 | 2,739 | 2,708 | -1.4 |
| Rest of business sector | 17,808 | 18,500 | 19,136 | 19,353 | 19,758 | 19,994 | 20,659 | 20,879 | 2.3 |
| Business sector | 20,801 | 21,461 | 21,997 | 22,085 | 22,441 | 22,711 | 23,399 | 23,587 | 1.8 |
| | dollars per hour worked | | | | | | | | percent |
| Labour productivity | | | | | | | | | |
| Sole proprietorships | 18.5 | 19.6 | 21.0 | 22.5 | 23.8 | 24.7 | 26.0 | 26.5 | 5.2 |
| Rest of business sector | 36.2 | 37.9 | 40.8 | 41.4 | 41.9 | 43.6 | 45.2 | 47.9 | 4.1 |
| Business sector | 33.6 | 35.4 | 38.2 | 39.0 | 39.8 | 41.3 | 42.9 | 45.5 | 4.4 |

Note: Numbers may not add up because of rounding.
Source: Statistics Canada, authors' calculations and T4 data.

Sole-proprietorship businesses are also mainly small and operated by self-employed owners with no or few staff. The level of productivity for sole proprietorships, as measured by nominal GDP per hour worked, was much smaller (\$26.5 in 2005) than for the rest of the business sector (\$47.9 in 2005) (Table 6).²⁵

5.2 Labour productivity in the United States

While the unincorporated sector in Canada accounted for 9.5% of total GDP in 2005, the non-corporate sector generated about 23.7% of the U.S business-sector GDP in 2005. Most of these enterprises in the United States are involved in partnerships by individuals or in LLCs. Luttrell *et al.* (2006) reported that LLCs grew very rapidly after the mid-1990s. In 2003, LLCs represented close to 46% of all partnerships filings.

25. When mixed income is used to separate self-employed hours worked for sole proprietorships and partnerships in the unincorporated sector, the results are similar (see footnote 22). GDP per hour worked for sole proprietorships is slightly higher—about 0.8 of a percentage point from 1998 (\$19.1) to 2005 (\$27.4). GDP per hour worked in the rest of the business sector falls by about 0.2 of a percentage point per year from 1998 to 2005.

Table 7
Gross domestic product, hours worked, and labour productivity for the non-corporate, corporate, and business sectors in the United States, 1998 to 2005

| | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | Average annual growth, 1998 to 2005 |
|---|-------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-------------------------------------|
| | millions of dollars | | | | | | | | percent |
| Gross domestic product at market prices | | | | | | | | | |
| Non-corporate | 1,423,995 | 1,515,988 | 1,639,014 | 1,787,927 | 1,836,862 | 1,935,110 | 2,117,742 | 2,298,656 | 7.1 |
| Corporate | 5,386,805 | 5,733,012 | 6,076,486 | 6,125,673 | 6,295,938 | 6,567,690 | 6,966,858 | 7,396,844 | 4.6 |
| Business sector | 6,810,800 | 7,249,000 | 7,715,500 | 7,913,600 | 8,132,800 | 8,502,800 | 9,084,600 | 9,695,500 | 5.2 |
| | millions of hours | | | | | | | | percent |
| Hours worked | | | | | | | | | |
| Non-corporate | 38,639 | 39,083 | 39,252 | 41,301 | 41,513 | 42,956 | 44,709 | 45,999 | 2.5 |
| Corporate | 181,621 | 185,274 | 190,309 | 184,662 | 179,757 | 176,702 | 177,541 | 179,893 | -0.1 |
| Business sector | 220,260 | 224,357 | 229,561 | 225,963 | 221,270 | 219,659 | 222,250 | 225,892 | 0.4 |
| | dollars per hour worked | | | | | | | | percent |
| Labour productivity | | | | | | | | | |
| Non-corporate | 36.9 | 38.8 | 41.8 | 43.3 | 44.2 | 45.0 | 47.4 | 50.0 | 4.4 |
| Corporate | 29.7 | 30.9 | 31.9 | 33.2 | 35.0 | 37.2 | 39.2 | 41.1 | 4.8 |
| Business sector | 30.9 | 32.3 | 33.6 | 35.0 | 36.8 | 38.7 | 40.9 | 42.9 | 4.8 |

Note: Numbers may not add up because of rounding.

Sources: Statistics Canada, Labour Productivity Program; Bureau of Labor Statistics (special tabulation of hours worked for the self-employed and the business sector); and Bureau of Economic Analysis, Tables 1.13 and 1.3.5.

Contrary to the Canadian situation, the level of productivity as measured by nominal GDP per hour worked was larger in 2005 for non-corporate enterprises (\$50.0) than for corporations (\$41.1) (Table 7).

Sole-proprietorship businesses are also mainly small and operated by self-employed owners with no or few staff.²⁶ The level of productivity as measured by nominal GDP per hour worked was smaller in 2005 for sole proprietorships (\$31.5) than for the rest of the business sector (\$44.1) (Table 8).²⁷

The level of productivity for the rest of the business sector was about 2% to 3% higher than that for corporations from 1998 to 2005.

26. The wage bill of sole proprietorships as a percentage of the business sector was very small—about 2.1% in 2005, based on IRS Table 10 and BEA Table 1.13.

27. When mixed income is used to separate self-employed hours worked for sole proprietorships and partnerships in the non-corporate sector, GDP per worker for sole proprietorships is overestimated (see footnote 22). GDP per hour worked for sole proprietorships is substantially higher—about 36% to 68% from 1998 (\$32.2) to 2005 (\$53.0).

Table 8
Gross domestic product, hours worked, and labour productivity for sole proprietorships and the rest of the business sector in the United States, 1998 to 2005

| | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | Average annual growth, 1998 to 2005 |
|---|-------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-------------------------------------|
| | millions of dollars | | | | | | | | percent |
| Gross domestic product at market prices | | | | | | | | | |
| Sole proprietorships | 506,222 | 523,742 | 537,965 | 542,949 | 575,038 | 601,219 | 635,858 | 665,386 | 4.0 |
| Rest of business sector | 6,304,578 | 6,725,258 | 7,177,535 | 7,370,651 | 7,557,762 | 7,901,581 | 8,448,742 | 9,030,114 | 5.3 |
| Business sector | 6,810,800 | 7,249,000 | 7,715,500 | 7,913,600 | 8,132,800 | 8,502,800 | 9,084,600 | 9,695,500 | 5.2 |
| | millions of hours | | | | | | | | percent |
| Hours worked | | | | | | | | | |
| Sole proprietorships | 21,343 | 20,906 | 20,717 | 20,291 | 19,909 | 20,579 | 21,073 | 21,148 | -0.1 |
| Rest of business sector | 198,916 | 203,451 | 208,844 | 205,672 | 201,361 | 199,080 | 201,177 | 204,744 | 0.4 |
| Business sector | 220,260 | 224,357 | 229,561 | 225,963 | 221,270 | 219,659 | 222,250 | 225,892 | 0.4 |
| | dollars per hour worked | | | | | | | | percent |
| Labour productivity | | | | | | | | | |
| Sole proprietorships | 23.7 | 25.1 | 26.0 | 26.8 | 28.9 | 29.2 | 30.2 | 31.5 | 4.1 |
| Rest of business sector | 31.7 | 33.1 | 34.4 | 35.8 | 37.5 | 39.7 | 42.0 | 44.1 | 4.8 |
| Business sector | 30.9 | 32.3 | 33.6 | 35.0 | 36.8 | 38.7 | 40.9 | 42.9 | 4.8 |

Note: Numbers may not add up because of rounding.

Sources: Statistics Canada, Labour Productivity Program; Bureau of Labor Statistics (special tabulation of hours worked for the self-employed and the business sector); Bureau of Economic Analysis, Tables 1.13 and 1.3.5; and Internal Revenue Service, Tables 2, 10, and 11.

6 Prices index for comparing Canadian and U.S. output

Relative labour productivity is derived by comparing the volume of output per hour worked in Canada to the volume of output per hour worked in the United States. These estimates are generated in the first instance from measures of nominal-dollar or current-dollar GDP per hour worked calculated in the national currencies of each country; these estimates are then deflated by a relative price index in order to transform the dollar estimates into volume estimates.

The relative price index needed for this purpose is a measure of producing power parity; this is not the usual expenditure-based purchasing power parity measure that Statistics Canada produces for cross-country comparisons. The latter are derived from price data on final-expenditure categories; they generate purchasing power parities, not producing power parities (Baldwin and Macdonald 2009). The estimates of purchasing power parities were designed to give reasonable coverage for expenditures on final goods—not for intermediate commodities or measures of value added (gross output minus materials, services, and energy inputs), where deflators are needed for both gross output and intermediate inputs.

Baldwin, Gu and Yan (2008) combine the commodity data on final-expenditure commodities and Input-Output tables in order to derive measures of relative prices that can be used for both outputs and inputs at the individual industry level. Baldwin, Gu and Yan use detailed prices for 2,000 items (obtained from Statistics Canada's bilateral Canada–United States bilateral purchasing power parity program) and match them to some 221 commodity groups in the Input-Output tables and calculate deflators for both outputs and inputs for each industry. The resulting market-price producing power parities (PPPs) are consistent with the basic-price concept of output. These PPPs between Canada and the United States are expressed as the price of one Canadian dollar's worth of a product in terms of U.S. dollars.

Table 9
Estimating producer power parity at market prices

| | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 |
|---|---------------------|-------|-----------|-------|--------|--------|--------|--------|
| Converting PPPs (basic price) to PPP (market price) | | | | | | | | |
| | millions of dollars | | | | | | | |
| Canada | | | | | | | | |
| Line 1 - Taxes less subsidies on products | ... | ... | 76,647 | ... | ... | ... | ... | ... |
| Line 2 - Gross domestic product at market prices | ... | ... | 1,076,577 | ... | ... | ... | ... | ... |
| | rate | | | | | | | |
| Line 3 - Tax rate (line 1 by line 2) | ... | ... | 7.1 | ... | ... | ... | ... | ... |
| | millions of dollars | | | | | | | |
| United States | | | | | | | | |
| Line 4 - Taxes less subsidies on products | ... | ... | 338,942 | ... | ... | ... | ... | ... |
| Line 5 - Gross domestic product at market prices | ... | ... | 9,951,500 | ... | ... | ... | ... | ... |
| | rate | | | | | | | |
| Line 6 - Tax rate (line 4 by line 5) | ... | ... | 3.4 | ... | ... | ... | ... | ... |
| Line 7 - Adjustment | ... | ... | 1.0 | ... | ... | ... | ... | ... |
| | ratio | | | | | | | |
| Line 8 - PPP (basic prices as published by Baldwin [2005]) | ... | 0.830 | ... | ... | ... | ... | ... | ... |
| Line 9 - PPP (adjusted to market price)(line 8 by line 7) | ... | 0.801 | ... | ... | ... | ... | ... | ... |
| Interpolating using business-sector Canadian and U.S. price deflators | | | | | | | | |
| | index | | | | | | | |
| Business-sector price deflators | | | | | | | | |
| Line 10 - Canada | 92.68 | 94.36 | 98.44 | 99.44 | 100.00 | 103.55 | 107.38 | 111.15 |
| Line 11 - United States | 94.99 | 95.75 | 97.50 | 99.21 | 100.00 | 101.42 | 104.04 | 107.42 |
| | ratio | | | | | | | |
| Line 12 - Ratio of United States to Canada (line 11 by line 10) | 1.02 | 1.01 | 0.99 | 1.00 | 1.00 | 0.98 | 0.97 | 0.97 |
| Line 13 - PPP adjusted to market price | 0.81 | 0.80 | 0.78 | 0.79 | 0.79 | 0.77 | 0.77 | 0.76 |

Notes: 'PPP' stands for 'producing power parity.' The tax adjustment rate was estimated for the year 2000 since data were not available in the United States for 1999. Canadian gross domestic product at market price and tax on products (both in millions of dollars) were obtained from CANSIM Table 380-0030. U.S. gross domestic product at market price and taxes on products less subsidies and import duties (both in millions of dollars) were obtained from Bureau of Economic Analysis Table 900. The Canadian business-sector deflator was obtained from a special tabulation carried out by the Income and Expenditure Accounts Division of Statistics Canada. The U.S. business-sector deflator was obtained from Bureau of Economic Analysis Tables 1.3.5 and 1.3.6.

In this paper, an adjustment was made to this 1999 PPP benchmark (consistent with a basic price concept of output) in order to convert the PPPs to a market-price concept (Table 9). This adjustment was based on relative product tax rates between Canada and the United States—or the ratio of GDP at market prices to GDP at basic prices—for the total economy.²⁸

28. The PPPs are derived by means of a basic-price concept. Baldwin, Gu and Yan (2008) provided a 1999 benchmark for the PPP. The 1999 estimates were projected forward using the relative movements of the GDP deflators for Canada and the United States.

7 The gap in business-sector labour productivity between Canada and the United States

The impact of the unincorporated sector on the overall gap in business-sector productivity can be assessed by examining the difference in the business sector with the unincorporated sector removed, which is the difference in just the corporate sectors.

Labour productivity in the Canadian business sector was 88% of labour productivity in the U.S. business sector in 1998. The gap in labour productivity declined when Canadian unincorporated and U.S. non-corporate firms were removed. In 1998, the labour productivity of Canadian corporations was about the same (99%) as that of U.S. corporations (Table 10).

Table 10
Relative business-sector labour productivity (in U.S. dollars) between Canada and the United States, corporate and unincorporated (non-corporate) sectors, 1998 to 2005

| | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | Average annual growth, 1998 to 2005 |
|---------------------------------------|--------------|-------|-------|-------|-------|-------|-------|-------|-------------------------------------|
| | ratio | | | | | | | | percent |
| Producer power parity at market price | 0.809 | 0.801 | 0.782 | 0.788 | 0.790 | 0.773 | 0.765 | 0.763 | -0.8 |
| | U.S. dollars | | | | | | | | percent |
| Canada | | | | | | | | | |
| Unincorporated | 17.2 | 18.0 | 18.9 | 20.3 | 21.8 | 22.2 | 23.1 | 23.4 | 4.5 |
| Corporate | 29.4 | 30.5 | 32.0 | 32.7 | 33.1 | 33.6 | 34.5 | 36.6 | 3.2 |
| Business sector | 27.2 | 28.3 | 29.9 | 30.7 | 31.4 | 31.9 | 32.8 | 34.7 | 3.5 |
| United States | | | | | | | | | |
| Non-corporate | 36.9 | 38.8 | 41.8 | 43.3 | 44.2 | 45.0 | 47.4 | 50.0 | 4.4 |
| Corporate | 29.7 | 30.9 | 31.9 | 33.2 | 35.0 | 37.2 | 39.2 | 41.1 | 4.8 |
| Business sector | 30.9 | 32.3 | 33.6 | 35.0 | 36.8 | 38.7 | 40.9 | 42.9 | 4.8 |
| | ratio | | | | | | | | percent |
| Relative Canada–United States level | | | | | | | | | |
| Unincorporated/non-corporate | 46.7 | 46.5 | 45.2 | 46.8 | 49.2 | 49.4 | 48.8 | 46.8 | 0.0 |
| Corporate | 99.2 | 98.6 | 100.4 | 98.5 | 94.5 | 90.5 | 87.9 | 88.9 | -1.6 |
| Business sector | 88.0 | 87.7 | 88.9 | 87.8 | 85.4 | 82.5 | 80.3 | 80.8 | -1.2 |

Sources: Tables 5, 7, and 9.

In the post-2000 period, the productivity gap between Canada and the United States has widened; this is primarily the result of declines in the relative performance of manufacturing and telecommunications (Baldwin and Gu 2009). The overall gap, which stood at 12 percentage points in 1998, increased to 19 percentage points for the total business sector by 2005 and from 0.8 to 11 percentage points when only the corporate sector was considered.

The impact of the unincorporated sector on the size of the gap in labour productivity falls from about 11.2 percentage points (the difference between 99.2 and 88 as set out in Table 10) in 1998 to about 8.1 percentage points (the difference between 88.9 and 80.8) in 2005. During this period, the productivity of the unincorporated sector in Canada relative to the productivity of the non-corporate sector in the United States remained about the same, but the relative productivity of the corporate sector fell. By 2005, the productivity gap between Canada and the United States came from both the corporate sector and the unincorporated sector.

The previous comparisons have excluded the entire Canadian unincorporated and U.S. non-corporate sectors, which includes both partnerships and sole proprietorships. Sole proprietorships in the two countries more closely resemble one another than do partnerships.

When only sole proprietorships were removed from the business-sector estimates of each country (leaving a comparison of the “rest of the business sector”—partnerships and the corporate sector), the gap in labour productivity also declined. When sole proprietorships were removed, the productivity of the rest of the Canadian business sector increased from 88.0% to 92.4% of the level of U.S. corporate productivity in 1998—a reduction in the gap of about 4.4 percentage points (Table 11).

The remaining 5.8 percentage points (the difference between 99.2. and 92.4) arising from the unincorporated sector is attributable to the higher productivity of U.S. partnerships. The contribution of sole proprietorships to the Canada-United States labour productivity gap declined to 2.1 percentage points in 2005, as a gap between the Canadian and U.S. corporate sector developed.

Table 11
Relative business-sector labour productivity (in U.S. dollars) between Canada and the United States, sole proprietorships and rest of business sector, 1998 to 2005

| | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | Average annual growth, 1998 to 2005 |
|---------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------------------------------------|
| | | | | | | | | | ratio |
| Producer power parity at market price | 0.809 | 0.801 | 0.782 | 0.788 | 0.790 | 0.773 | 0.765 | 0.763 | -0.8 |
| | | | | | | | | | percent |
| | | | | | | | | | U.S. dollars |
| Canada | | | | | | | | | |
| Sole proprietorships | 15.0 | 15.7 | 16.4 | 17.7 | 18.8 | 19.1 | 19.9 | 20.2 | 4.4 |
| Rest of business sector | 29.3 | 30.4 | 31.9 | 32.6 | 33.1 | 33.7 | 34.5 | 36.6 | 3.2 |
| Business sector | 27.2 | 28.3 | 29.9 | 30.7 | 31.4 | 31.9 | 32.8 | 34.7 | 3.5 |
| United States | | | | | | | | | |
| Sole proprietorships | 23.7 | 25.1 | 26.0 | 26.8 | 28.9 | 29.2 | 30.2 | 31.5 | 4.1 |
| Rest of business sector | 31.7 | 33.1 | 34.4 | 35.8 | 37.5 | 39.7 | 42.0 | 44.1 | 4.8 |
| Business sector | 30.9 | 32.3 | 33.6 | 35.0 | 36.8 | 38.7 | 40.9 | 42.9 | 4.8 |
| | | | | | | | | | ratio |
| Relative Canada–United States level | | | | | | | | | percent |
| Sole proprietorships | 63.1 | 62.6 | 63.3 | 66.2 | 65.1 | 65.5 | 66.1 | 64.2 | 0.2 |
| Rest of business sector | 92.4 | 91.9 | 92.8 | 90.9 | 88.2 | 84.9 | 82.3 | 82.9 | -1.5 |
| Business sector | 88.0 | 87.7 | 88.9 | 87.8 | 85.4 | 82.5 | 80.3 | 80.8 | -1.2 |

Sources: Tables 6, 8, and 9.

An alternative method can be employed to estimate the hours worked of sole proprietorships and to test the sensitivity of the earlier findings to alternate assumptions in this area. In Table 11, the hours worked of employees of self-employed sole proprietorships are estimated by assuming that the ratio of hours worked of this group in the total business sector is equal to the ratio of their wage bills to total wages in the business sector.

Alternatively, the hours worked of sole proprietorships set out in Table 12 are derived from employment shares.²⁹ This relaxes the assumption that all employees in the business sector are paid the same wage,³⁰ but instead assumes that employees in each of the sectors work the same number of hours. The first methodology leads to an underestimate of hours worked by sole proprietorships when sole proprietorships pay lower wages to paid workers than do corporations. The second methodology leads to an overestimation of hours worked in sole proprietorships when employees of small sole proprietorships work fewer hours.³¹

The two methodologies for splitting hours worked between sole proprietorships and the rest of the business sector bound the estimates of the contribution of sole proprietorships to the Canada–United States labour productivity gap. Table 3 and Table 4 suggest that paid employees account for more of the hours worked in U.S. sole proprietorships than in Canadian sole proprietorships.³² Therefore, the degree to which the labour productivity of sole proprietorships is overestimated or underestimated is greater in the United States. When the wage bill is used to split hours worked, hours worked in sole proprietorships are underestimated and labour productivity is overestimated; however, the degree of overestimation is greater in the United States. Similarly, when employment is used to split hours worked, labour productivity in sole proprietorships is underestimated more in the United States than in Canada. As a result, actual labour productivity of sole proprietorships in Canada relative to actual labour productivity of sole proprietorships in the United States and estimates of the contribution of sole proprietorships to the Canada–United States labour productivity gap likely fall between the ones found in Tables 11 and 12.

Sole proprietorships account for more hours worked when the second method is employed. In Canada, hours worked in sole proprietorships increased to 3,149-million hours in 2005; this figure is 16% higher than the 2,708-million hours presented in Table 3. In the United States, hours worked in sole proprietorships increased to 23,587-million hours in 2005, a figure that is 12% higher than the 21,148-million hours presented in Table 4. This method lowers the GDP per hour worked for sole proprietorships for 2005 from \$26.5 to \$22.8 (Canadian dollars) for Canada and from \$31.5 to \$25.9 (U.S. dollars) for the United States.

However, when hours worked are divided according to employment shares instead of according to wage bill shares, it is found that sole proprietorships contribute about the same amount to the differences in labour productivity between Canada and the United States. In 2005, the relative productivity for the business sector was 80.8, 2.0 percentage points lower than the relative productivity for the rest of the business sector (82.8)—(Table 12)—but almost the same amount as that reported in Table 11 for the same year.

29. The U.S. employees of sole proprietorships, calculated as a share of the total number of employees, are obtained from the Statistics of U.S. Businesses (U.S. Census Bureau). For Canada, employment for 2005 was arrived at by means of an estimate based on employment figures obtained from the Survey of Employment, Payrolls and Hours (SEPH) (Economic Analysis Division of Statistics Canada). However, data are not available on employment of sole proprietorships for prior years; the growth of the number of T4 slips issued to employees of sole proprietorships was used instead.

30. According to the 1997 Statistics of U.S. Businesses, the average wage per worker for corporations and partnerships in the United States was US\$30,286 that year, while the average wage per worker for sole proprietorships stood at US\$14,463.

31. Using the U.S. Current Population Survey, Berger *et al.* (1999) showed that 69% of private non-agriculture workers aged 16 and over employed by small firms (firms with fewer than 10 employees) worked 35 hours per week or more. In larger firms employing 500 or more, 81% of employees worked 35 hours per week or more.

32. Paid employees account for more of the hours worked in U.S. sole proprietorships than in Canadian sole proprietorships, regardless of whether the estimate of hours worked is split according to the wage bill or employment.

Table 12
Relative business-sector labour productivity (in U.S. dollars) between
Canada and the United States, sole proprietorships and rest of business
sector, 2002 to 2005

| | 2002 | 2003 | 2004 | 2005 | Average annual growth, 2002 to 2005 |
|---------------------------------------|-------|--------------|-------|-------|---|
| | | ratio | | | percent |
| Producer power parity at market price | 0.790 | 0.773 | 0.765 | 0.763 | -0.8 |
| | | U.S. dollars | | | percent |
| Canada | | | | | |
| Sole proprietorships | 16.3 | 16.6 | 17.2 | 17.4 | 1.7 |
| Rest of business sector | 33.8 | 34.4 | 35.3 | 37.4 | 2.5 |
| Business sector | 31.4 | 31.9 | 32.8 | 34.7 | 2.5 |
| United States | | | | | |
| Sole proprietorships | 23.4 | 24.0 | 24.9 | 25.9 | 2.5 |
| Rest of business sector | 38.4 | 40.6 | 42.9 | 45.1 | 4.1 |
| Business sector | 36.8 | 38.7 | 40.9 | 42.9 | 4.0 |
| | | ratio | | | percent |
| Relative Canada–United States level | | | | | |
| Sole proprietorships | 69.4 | 69.4 | 68.8 | 67.2 | -0.8 |
| Rest of business sector | 88.1 | 84.7 | 82.2 | 82.8 | -1.5 |
| Business sector | 85.4 | 82.5 | 80.3 | 80.8 | -1.4 |

Sources: Tables 6, 8, 9, 11 and Text table 1; and the 2002 and 2007 Statistics of U.S. Businesses.

In summary, the Canadian unincorporated sector contributed a sizable portion of the gap in labour productivity (around 11 percentage points) between Canada and the United States in 1998. The contribution of the Canadian unincorporated sector fell over time because the gap in labour productivity became larger as the relative productivity of the corporate sector fell. This gap is due to differences in the labour productivity of sole proprietorships and partnerships. Since the notion of small business is more closely associated with sole proprietorships than with the large partnerships that, in the United States, are so heavily concentrated in the financial sector, the exercise is repeated by removing sole proprietorships.

When sole proprietorships are removed from the business-sector estimates of each country (leaving a comparison what is referred to here as ‘the rest of the business sector’, consisting of partnerships and the corporate sector), the gap in labour productivity between Canada and the United States also declined. Removing sole proprietorships increases the ratio of relative labour productivity from 88.0% to 92.4% in 1998. The impact of sole proprietorships on the size of the gap in labour productivity is about 4.4 percentage points in 1998 and 2.1 percentage points in 2005.. This decline in the contribution of sole proprietorship to the Canada – United States labour productivity gap is robust to the methodology employed for dividing hours worked between sole proprietorships and the rest of the business sector.

The majority of the overall effect in the unincorporated/non-corporate sector as a whole in 1998 and 2005 is accounted for by a very high U.S. productivity advantage in the other component of the non-corporate sector, namely partnerships, which have their foundation in the U.S. financial and real estate sectors.

8 Conclusion

This paper has investigated the source of the gap between Canadian and U.S. productivity levels. The findings demonstrate that some of the difference arises from the greater importance of the unincorporated self-employed sector in Canada and its relatively lower level of productivity.

The estimate of the amount of the Canada–United States productivity gap that is due to the unincorporated sector depends on the validity of the various assumptions that have been made in generating the data used here. However, alternate approaches yield a conclusion that is qualitatively the same—the Canadian unincorporated sector contributes a sizeable portion of the gap between Canadian and U.S. labour productivity. This contribution was more substantial in the 1990s; it has declined post-2000 as a gap between the Canadian and U.S. corporate sectors increased. Most of the gap originating in the unincorporated sector is due not so much to the sole-proprietorship sector as to the relatively larger size and profitability of U.S. partnerships.

The group of the unincorporated sector that is defined as sole proprietorships account for about 4 percentage points of the total gap—or about one third of the total gap in 1999 and for about 2 percentage points of the total gap in 2005.. While this group does not account for the entire gap, it must be recognized that this group of small firms makes up only a part of the small-firm universe. Further work is required in order to examine how other small firms in the corporate sector also contribute to the Canada–United States productivity gap.

Identifying the source of the productivity gap and understanding the reasons for this gap are different matters since differences in relative productivity between the unincorporated and corporate sector can arise from a number of separate causes.

These differences may be due to the smaller size of the Canadian market. Economists have attributed differences in firm size to differences in market size (Kumar, Rajan, and Zingales 1999; Davis and Henrekson 1999). Smaller markets may not permit small firms to grow to become larger entities. Unincorporated firms are at the first stage in the life cycle of firms. New producers often start off as unincorporated entities and later make the transition to corporations if they can afford the costs of incorporation and can achieve the corporate organizational form needed in order to limit liabilities.

If this is the explanation behind a larger share of small unincorporated producers in Canada, then market size is indirectly at the heart of the differences that are reported here. The differences between Canadian and U.S. productivity levels would arise in this instance not from differences in the lack of entrepreneurs at the early-development stage but from the failure to grow this dynamic group.

Other explanations may lie in institutional differences that are not necessarily related to the size of markets (Garen 2006). It is possible that only the most unproductive small firms in Canada remain unincorporated, while the more productive small firms become incorporated. This could arise if tax incentives for the very small firms being run by the self-employed to incorporate are greater in Canada than they are in the United States and if this impacts more heavily on the most productive of the small firms. The tax system may also encourage paid workers to become self-employed (Schuetze 2000; Bruce 2000)—if the tax system allows the unincorporated self-employed to deduct what would otherwise be consumption expenditures.

Tax policy differences then could be at the heart of the Canadian disadvantage that results from having a less productive sector of self-employed. Evaluating this possibility is beyond the scope of this paper.³³

Other potential differences in the underlying structure of the two economies may also account for the relatively large size of less productive self-employed in Canada. Unincorporated self-employed are particularly important in agriculture and are relatively more important in this industry in Canada than in the United States. As well, the relatively harsher northern Canadian climate may produce a lower productivity in this sector than in the United States.

There may also be different incentives in the two countries for companies to outsource workers—to change the status of a workforce from being employed to being hired as contract workers. The latter can reduce benefit payments that companies incur (Zeytinoglu and Cooke 2005). Some of these benefits arise from legislated entitlements; others may arise from differences in payroll taxes (Lin 2000). If this is done more for higher-paid workers and if these workers choose to become unincorporated entrepreneurs, an increase in the measured income of the unincorporated workers in one country relative to the other will result.³⁴

Finally, the differences in the financial and real estate sectors in the two countries likely stem from differences in the two economies (resulting from the central role played by the United States in world financial markets) or differences in tax laws governing real estate investments.

The range of possible explanations of the source of the difference in the size of the unincorporated sector in Canada and in the United States offers a rich set of hypotheses as to the factors that have caused the gap in the overall productivity level between Canada and the United States arising from the unincorporated sector.

33. Evaluating differences in tax policies between the two countries would require comparing the personal-tax rates and corporate-tax rates of the two countries and examining the different incentives to incorporate. For example, the United States offers a form of organization that is not corporate but nevertheless provides the limited liability protection of corporations—the Limited Liability Company (LLC)—which does not exist in Canada.

34. For a discussion of outsourcing in the United States, see Dey, Houseman, and Polivka (2007).

Appendix

Table A1
Gross domestic product at market prices, hours worked, and relative labour productivity of sole proprietorships and rest of the business sector (including partnerships and corporations), Canada and the United States, 2002 to 2005

| | 2002 | 2003 | 2004 | 2005 | Average growth rate, 2002 to 2005 |
|---|-------------------------|-----------|-----------|-----------|-----------------------------------|
| | millions of dollars | | | | percent |
| Gross domestic product at market prices | | | | | |
| Business sector | | | | | |
| Canada | 892,450 | 937,985 | 1,004,220 | 1,072,459 | 4.7 |
| United States | 8,132,800 | 8,502,800 | 9,084,600 | 9,695,500 | 4.5 |
| Sole proprietorships | | | | | |
| Canada | 63,900 | 67,229 | 71,353 | 71,687 | 2.9 |
| United States | 575,038 | 601,219 | 635,858 | 665,386 | 3.7 |
| Corporate and partnerships | | | | | |
| Canada | 828,550 | 870,756 | 932,867 | 1,000,772 | 4.8 |
| United States | 7,557,762 | 7,901,581 | 8,448,742 | 9,030,114 | 4.6 |
| | millions of hours | | | | percent |
| Hours worked | | | | | |
| Business sector | | | | | |
| Canada | 22,441 | 22,711 | 23,399 | 23,587 | 1.3 |
| United States | 221,270 | 219,659 | 222,250 | 225,892 | 0.5 |
| Sole proprietorships | | | | | |
| Canada | 3,103 | 3,124 | 3,181 | 3,149 | 0.4 |
| United States | 24,539 | 25,076 | 25,486 | 25,730 | 1.2 |
| Corporate and partnerships | | | | | |
| Canada | 19,338 | 19,587 | 20,217 | 20,438 | 1.4 |
| United States | 196,731 | 194,583 | 196,764 | 200,162 | 0.4 |
| | dollars per hour worked | | | | percent |
| Labour productivity | | | | | |
| Business sector | | | | | |
| Canada | 39.8 | 41.3 | 42.9 | 45.5 | 3.4 |
| United States | 36.8 | 38.7 | 40.9 | 42.9 | 4.0 |
| Sole proprietorships | | | | | |
| Canada | 20.6 | 21.5 | 22.4 | 22.8 | 2.5 |
| United States | 23.4 | 24.0 | 24.9 | 25.9 | 2.5 |
| Corporate and partnerships | | | | | |
| Canada | 42.8 | 44.5 | 46.1 | 49.0 | 3.4 |
| United States | 38.4 | 40.6 | 42.9 | 45.1 | 4.1 |

Sources: Tables 6, 8, 9, and 11; and the 2002 and 2007 U.S. Census.

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