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Canada: A Macroeconomic Study of the United States' Most Important Trade Partner

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Abstract

Canada has become the most important trading partner of the United States in terms of total trade and agricultural trade. In 2005, exports to Canada amounted to 23 percent of total U.S. exports and 17 percent of U.S. agricultural exports, while imports from Canada amounted to 17 percent of total U.S. imports and 21 percent of U.S. agricultural imports. Canada is a large exporter to the United States of critical raw materials, including natural gas, petroleum, and wood products, and a substantial importer of finished industrial and consumer goods. Canadian agricultural exports to the United States are primarily in consumer processed goods such as beef, fish, seafood, breads, and confectionery items, while Canadian imports from the United States include baked goods, fruit and vegetable juices, and fresh fruits and vegetables. Canadian agricultural trade continues to grow in importance reflecting trade liberalization and greater integration of agricultural markets. The trade outlook is enhanced by Canada's prospects for long-term economic growth of about 3 percent per year, which is underpinned by expected moderate growth in working-age population and labor productivity.

Keywords: U.S.-Canadian trade, capital flows, capital structure, real trade weighted exchange rate, labor productivity, multifactor productivity, long-term growth outlook.

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Introduction

Canada has become the most important trading partner with the United States, with almost 20 percent of U.S. trade; in addition, the United States depends increasingly on Canada for supplies of strategic resources such as energy, metals, and lumber. Canada is the largest supplier of energy in the form of oil and oil products, natural gas, and electricity to the United States. In 2004, U.S. exports of goods and services to Canada exceeded the combined U.S. exports to Mexico and Japan, the second and third largest U.S. export markets. Canada plays a key role in the U.S. manufacture of automobiles, automobile components, lumber products, and metal products. Canada is also the largest market for, and supplier of, agricultural commodities to the United States, mostly in the form of high-value products.

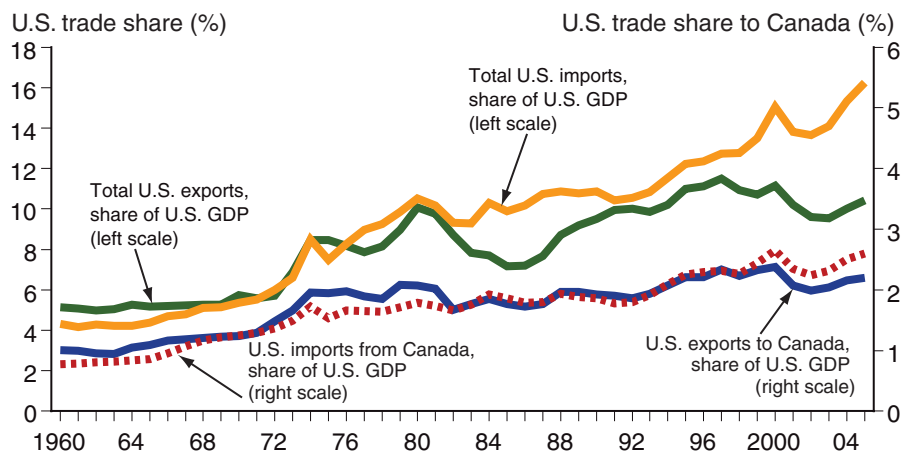
Canadian and U.S. industries have become increasingly integrated, as goods in various stages of production cross the two countries' border for completion. Thus, what happens to the Canadian economy in the years ahead is important to the long-term stability and growth of both the U.S. economy and the U.S. agricultural sector.

As the United States has become more dependent upon trade and foreign macroeconomic and financial conditions, Canada has become an increasingly important strategic and economic partner. U.S. exports as a share of gross domestic product (GDP) have doubled since 1960, while imports as a share of GDP have tripled (fig. 1). Much of that growth in trade has been with Canada. All of this occurred in spite of the fact that Canada's population and GDP are 11 and 9 percent, respectively, of those of the United States.

The growth in trade between Canada and the United States has benefited both countries by encouraging stronger economic growth through economic specialization, new product development, foreign investment, and increased competition. Consumers have also gained from lower prices and a greater

Figure 1

U.S. trade, total and with Canada, has more than doubled since 1960



Source: Bureau of Economic Analysis. U.S. International Transactions Accounts Data (http://www.bea.gov/bea/international/bp_web/simple.cfm?anon=71&table_id=10&area_id=9).

diversity of consumer goods. Increasing world financial integration has resulted in increased foreign capital inflows into the United States and Canada. Increased foreign capital inflows have helped to lower capital costs in the United States and Canada, but have increased the sensitivity of U.S. and Canadian interest rates to shifts in the willingness of global investors to hold North American financial assets. North American economic growth and trade is increasingly dependent on international customers around the world. Foreign growth, changing exchange rates, worldwide costs, and the international availability of major productive inputs are becoming increasingly important to both Canada and the United States.

This report provides an analysis of the Canadian economy, focusing on its trade with the United States and the rest of the world and evaluates Canada's long-term growth prospects. Knowledge of Canada's economic structure, trade patterns, and growth prospects is increasingly important in understanding the overall U.S. trade outlook, especially the export outlook for diverse U.S. industries that are heavily involved in exporting to Canada. Export growth is especially important for U.S. agriculture and manufacturing, which, in turn, are especially important to the economic welfare of rural America.

Given their geographical proximity, open trade regimes, and complementary factor endowments and production, it is not surprising that Canada and the United States are each others' most important trading partner. Canada's economic conditions have a significant impact on U.S. trade while Canadian-U.S. trade is so large a component of the Canadian economy that U.S. economic conditions have a direct impact on the Canadian economy. In 2005, 23 percent of all U.S. exports went to Canada, and 17 percent of all U.S. imports came from Canada. U.S.-Canadian trade is broad based, with Canada the destination for 25 percent of U.S. manufacturing and transportation exports and 19 percent of agricultural exports. Canada's exports represented 15 percent of U.S. manufacturing imports, 21 percent of agricultural imports, and 23 percent of energy and mineral imports. The United States, however, is the source and destination for the overwhelming majority of all Canadian imports and exports

The further expansion of trade between the United States and Canada will be heavily influenced by the long-term growth prospects of the U.S. and Canadian economies. Strong Canadian economic growth translates into increased Canadian demand for U.S. exports and greater trading opportunities over time between Canada and the United States. Strong Canadian growth prospects enhance the willingness of U.S. firms to devote additional resources to the production and distribution of U.S. goods and services in Canada. Trade growth is enhanced when both Canada and the United States experience rapid growth spurred by economic innovation and specialization. Increased trade benefits consumers in both countries by providing a greater variety of goods at lower prices.

Canada's long-term potential GDP growth is around 3 percent. Canada's favorable long-term outlook is supported by moderate (1.3 percent) population growth and moderate (1.4 percent) growth in labor productivity. Rising labor force participation is contributing 0.3 percent to long-term growth. Canadian productivity growth has received a large boost from very strong

growth in business equipment investment. (Specifically, real business equipment investment has grown at an annualized average rate of 7.7 percent since 1995.) Canada's long-term growth outlook is also enhanced by its low rate of inflation (generally under 3 percent) and relatively mild business cycles over the past two decades. As a net energy exporter, Canada is less sensitive to worldwide energy price shocks than most industrialized countries. The Canadian economy is expected to continue to receive a boost from expected strong U.S. growth (3 percent or more) for the remainder of 2006 and 2007.

Overview of Canadian Economy, Industry, and Trade

Canada is a modern industrialized economy whose economic output and growth are enhanced by its highly educated population and intense use of capital. In 2005, Canada's population of 32.3 million was about 11 percent of the U.S. population while Canadian real purchasing power parity (PPP) GDP was approximately 9 percent of U.S. real GDP (table 1).¹ Canadian real PPP disposable per capita income is about 64 percent of the U.S. level. Canada depends much more on trade than does the United States: its export and import shares of real GDP are both around 41 percent, approximately 3 and 2.5 times the respective U.S. shares. The three largest categories of Canadian exports are energy, automotive and truck vehicles and parts, and wood and furniture products. On the import side, motor vehicles, computers and nonelectrical machinery, and chemicals are the dominant traded goods. Agriculture was 7 percent of Canadian exports and 6 percent of Canadian imports.²

Table 1

Canadian and U.S. economies in brief

	Canada	U.S.
GDP and population, 2005		
Population (millions)	32.3	296.8
Real GDP (PPP basis) ¹	1,006	11,135
Real per capita disposable income (PPP basis) in terms of 2000 U.S. dollars	17,352	27,341
	<i>Percent</i>	
Real exports' share of GDP	40.8	10.7
Real imports' share of GDP	40.6	16.4
Percent of real private industry output (value-added basis), 2004		
Primary industries (agriculture, forestry, fishing, and mining)	6.5	2.3
Agriculture	1.4	0.8
Other primary	5.1	1.5
Construction	6.1	4.6
Manufacturing	18.3	15.6
Services	69.1	77.6

¹ The purchase power parity (PPP) exchange rate adjusts currencies for differences in their purchasing power. Specifically, PPP adjusts real GDP and real personal income in Canada downward to reflect the overall higher prices of similar goods in Canada relative to the U.S. The real Canadian National Income and Products Account (NIPA) data (based on 1997 Canadian dollars) was approximated to real 2000 U.S. dollars by multiplying Canadian nominal GDP for 2000 by 1 plus the growth in Canadian real GDP over the 2000 to 2003 period and then dividing by the IMF Canada PPP index value for 2000 of 1.214. The Canadian PPP index for GDP is from the IMF's World Economic Outlook Database (April 2005) and its construction is discussed in Gulde and Schulze-Ghattas (1993).

Source: Bureau of Economic Analysis and Statistics Canada. BEA private industry output data can be found at http://www.bea.gov/bea/industry/gpotables/gpo_action.cfm?anon=1367&table_id=14099&format_type=0; Statistics Canada data can be found at <http://www40.statcan.ca/l01/cst01/econ41.htm>.

¹In this case, purchasing power parity measures the ratio of the total Canadian dollars required to purchase a given market basket of goods priced in American dollars. Since the market basket of goods in the two countries is assumed to be the same, the purchasing power exchange rate should be equal to the ratio of the price levels in the two countries.

²Canadian world trade data were obtained from Statistics Canada and U.N. COMTRADE. Data on bilateral trade between the U.S. and Canada were taken from the U.S. Department of Commerce and the Foreign Agricultural Trade of the United States (FATUS) databases. National Income and Products Accounts (NIPA) data came from the Bureau of Economic Analysis and the Canadian System of National Accounts (CSNA).

Canadian industry depends more on primary industries (agriculture, forestry, and mining) than does the United States, and basic manufacturing, and less on services and information technology. Primary industries' share of real GDP was 6.5 percent for Canada and 2.3 percent for the United States; agriculture has a 1.4-percent share of GDP in Canada and a 0.8-percent share in the United States (table 1). Canada's energy and forestry products industries export heavily to the United States. While Canada is somewhat more dependent upon overall manufacturing than the United States, the mix of manufacturing activity differs between the two countries. Transportation, wood and paper, and metals account for 43 percent of Canadian manufacturing, while these industries account for 37 percent of U.S. manufacturing. High-tech manufacturing is much more important in the United States than in Canada. Manufacturing of computers and their components, other electronic goods, and publishing accounted for 33 percent of U.S. manufacturing compared with 10 percent of Canadian manufacturing. Finally, the service economy in the United States has an 8.5-percent larger share than in Canada. Finance, insurance, and real estate services as a percentage of industry output were 2 percent higher and computer and communication technology services 1.5 percent higher in the United States than in Canada.

Canada's capital structure influences the composition of its output and trade (table 2). Almost 75 percent of Canada's capital stock is in land and structures compared with 33 percent in the United States. To overcome the relative scarcity of labor compared with its large land base, Canada's capital to

Table 2

Comparison of Canadian and U.S. private business capital services for 2002

Private capital stock in levels	Canada	U.S.
	<i>Billions of 2000 U.S. dollars</i>	
Total capital stock	335.0	2368.3
Information technology	24.6	553.6
Other machinery and equipment	80.3	623.6
Other capital assets (structures, residential rentals, land, and inventories)	230.3	1193.3
	<i>2000 U.S. dollars¹</i>	
Private capital to labor ratios for 2002 (Value of private business capital stock service flows divided by private business employment)	23,103	20,259
Total capital stock labor ratio	1,697	4,736
Information technology labor ratio	5,538	5,334
Other machinery and equipment labor ratio (structures, residential, rental, land, and inventories)	15,883	10,208

¹ Capital service flows are the value of services from the capital stock and are equal to the quantity of effective (age adjusted) capital stock multiplied by the average flow of income from a unit of capital (its rental return). Canada and the United States use similar procedures in estimating capital service flows; see U.S. Department's of Labor's *Trends in Multifactor Productivity, 1948-81*, for a detailed discussion of the methodology used in calculating service flows. Canadian service flows in 2000 Canadian dollars were converted to 2000 U.S. dollars by dividing the Canadian dollar estimate by the IMF purchasing power parity conversion factor for Canada in 2000 of 1.214.

Source: Statistics Canada and Bureau of Labor Statistics. Statistics Canada can be found from the national balance sheet data (table 378-0004 and unpublished rental cost of capital data; BLS data can be found in capital services by asset type (<http://www.bls.gov/web/prod3.suppl.toc.htm>))

labor ratio was 14 percent higher than the U.S. ratio in 2002.³ The greater capital intensity in Canada reflects a rational response to its large land mass, its highly educated work force (over 44 percent of Canadians over 15 years of age had a post-high-school education), and its highly developed economy. Canada's highly developed capital structure and its long open border with the United States encourage economic specialization to achieve economies of scale in production. This specialization results in Canada's concentrating production in industries such as light vehicle parts and assembly and wood and energy products, where it has significant product and cost advantages.

³The greater overall capital intensity for Canada relative to the United States for 2002 is similar to Salvatore's finding for 1979 and 1997 (p. 208).

Canada Depends on U.S. Trade

Canadian exports were 3.5 percent of world exports in 2004. Canada's export and import shares of GDP have expanded sharply since the early 1990s. The United States and Canada are each other's major trade partner. In general, Canadian trade reflects Canada's role as an exporter of raw materials, importer of finished consumer and business capital goods, and the importance of the North American automobile industry.

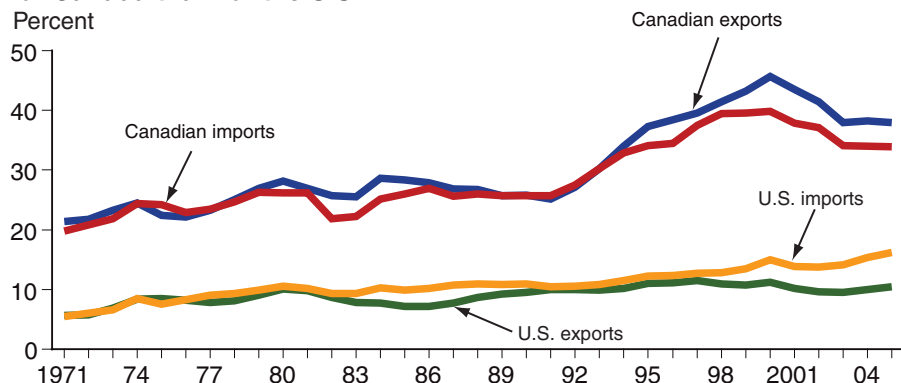
Canadian exports to the world and to the United States are heavily concentrated in the areas of passenger vehicles and transport trucks, mineral fuels and oils, and wood, paper, and furniture. Canadian exports reflect both comparative advantage in factor endowments and bilateral intra-industry trade in similar products fueled by economies of scale, product differentiation, and specialization in various stages of the production process. Canadian imports are concentrated in the areas of passenger vehicles and transport trucks (especially parts), computers, and electrical and nonelectrical machinery. The share of Canadian exports to the United States has expanded since 1990 while the U.S. share of Canadian imports has fallen, primarily because of increased competition for U.S. exports from China, Mexico, and Southeast Asia.

Canada's trade share of nominal GDP is much higher than that of the United States and has risen appreciably since 1990 (fig. 2). In 2005, Canadian exports totaled 38 percent of GDP, while imports totaled 34 percent. This compares to 26 percent for both in 1990. In 2005, the U.S. exports amounted to 10 percent of GDP, while imports amounted to 16 percent. Canada's greater reliance upon trade is due to its proximity to the United States, its relatively specialized domestic economy, its harsh climate, and its relatively high internal transportation costs.

Three main factors are behind the rise in Canada's trade share of GDP. First, trade liberalization through the Canada-U.S. Free Trade Agreement (Canada-U.S. FTA, 1989) and North American Free Trade Agreement (NAFTA, 1994)

Figure 2

Trade's share of nominal GDP is far greater for Canada than for the U.S.¹



¹Trade includes services.

Sources: Bureau of Economic Analysis and Statistics Canada. BEA data is found at <http://www.bea.gov/bea/di/home/bop.htm> and Statistics Canada data is located at <http://www.statcan.ca/english/nea-cen/data/index.htm>.

has eliminated most tariffs and other trade barriers between the United States, Canada, and Mexico. Second, lower transportation costs for international goods and improved communication systems have increased the variety of goods available for world trade and inter-industry trade in similar goods. Third, strong U.S. growth since the mid-1990s and a strong U.S. dollar over most of that period increased the U.S. demand for Canadian exports and further expanded opportunities for bilateral trade in similar goods.⁴

The United States is Canada's dominant trading partner. The United States accounted for 84 percent of Canadian merchandise exports in 2005 and supplied 57 percent of Canadian imports (table 3). Merchandise exports to Canada accounted for 23 percent of total U.S. merchandise exports, while imports from Canada accounted for 17 percent of total U.S. merchandise imports. Canada's other major trading partners include Japan, China, the EU, and Mexico (table 3). Japan, with 2.1 percent of Canadian exports, is a far distant second to the United States. Canadian exports to Japan are heavily concentrated in wood products, pork, canola, copper, and coal. The Western Europe export trade share has fallen since 1990, reflecting rising intraregional trade for both the EU and Canada and slow overall Western European economic growth over the period. Exports to China have gradually risen in recent years as China's rapid growth has increased its demand for Canadian wood pulp, industrial machinery, and organic chemicals.

Canadian exports are heavily concentrated in natural gas, crude oil, electricity, motor vehicles and parts, and wood, paper, and furniture products.

⁴For a detailed discussion of the evolution of Canadian merchandise trade from the late 1980s to the late 1990s, see Dion (2000).

Table 3
Canada trade shares for merchandise exports and imports

Country	1990	2005
	<i>Percent</i>	
Total exports	100.0	100.0
United States	75.8	84.0
Japan	5.5	2.1
United Kingdom	2.3	1.9
China	1.1	1.6
Mexico	0.4	0.8
Germany	1.5	0.7
South Korea	1.1	0.6
France	0.9	0.6
Netherlands	1.0	0.5
Belgium	0.8	0.5
Other countries	10.4	8.3
Total imports	100.0	100.0
United States	64.5	56.6
China	1.0	7.8
Mexico	1.3	3.8
Japan	7.0	3.8
United Kingdom	3.6	2.7
Germany	2.8	2.7
Norway	1.2	1.6
South Korea	1.7	1.4
France	1.8	1.3
Italy	1.4	1.2
Other countries	13.7	17.0

Source: Global Trade Atlas Canadian Edition and United Nations Statistics Division COM-TRADE, extracted from World Integrated Trade Solution (WITS) (<http://wits.worldbank.org>).

These areas represent 50 percent of total Canadian exports and 56 percent of Canadian exports to the United States (table 4). Canadian exports reflect the abundance of Canada's natural resources and the bilateral trade within the North American auto industry. Canada's agricultural exports are mostly wheat, rapeseed, pork, and beef.

Canada is the largest exporter of energy to the United States. In 2005, Canadian exports were 24 percent of U.S. energy imports. Canada's 13 percent share of crude oil exports to the United States trailed only Venezuela and Saudi Arabia. Canada was the largest source of refined fuel oil (15 percent) to the United States and dominated U.S. imports of natural gas and electricity. Real Canadian energy exports are likely to continue to increase at a rapid pace as continued high energy prices encourage more Canadian energy production and as the supply of energy continues to be tight worldwide.

Canada is a large world exporter of wood and furniture products, with a 12-percent share of wood- and paper-related exports and a 6-percent share of world furniture exports. Canada's large trade surplus in wood products reflects its endowment of soft and hardwood forests and its expertise in wood furniture manufacturing. Canadian wood exports to the United States focus on high-end lumber and wood products with less emphasis on wood pulp. Canada is the primary source of softwood lumber imports to the United States, despite prolonged disputes and restrictions on such imports since the early 1980s. These disputes have not yet been fully resolved.

While Canada is primarily a net exporter of raw materials, Canada's imports reflect its relative dependence upon finished consumer and industrial goods. Imports of vehicles and parts, computers, chemicals, metals, and machinery comprise 59 percent of Canadian imports and 64 percent of imports from the United States (table 5). The great importance of passenger vehicle and transportation trucks reflects the long history of intra-industry trade between the United States and Canada in the motor vehicle industry. Despite continued heightened global competition for the North America automobile industry, passenger vehicles and trucks for goods transport still had an 18-percent share of Canadian exports and 17-percent share of Canadian imports in 2005.

Canada's net imports of machinery reflect its general lack of comparative advantage in that area and the expanding role of computers and information technology in consumer goods and business capital goods spending. In 2005, Canada had a \$23-billion trade deficit in nonelectrical machinery and a \$14-billion deficit in electrical machinery. Since 1990, U.S. exports to Canada of chemicals, metals, plastics, and agricultural goods have grown at a faster pace than other U.S. exports.

The overall U.S. share of Canadian imports has fallen significantly since 1990 (see table 3), as competition, especially in manufacturing, has increased from China, Mexico, and Southeast Asia. The increased competition from these countries has been especially pronounced in the areas of telecommunications and computer equipment, vehicles, and apparel. Western Europe's share of Canadian imports has fallen over this period, reflecting the increased importance of interregional trade for Western Europe and Canada as well as increased global competition for Western European exports of electrical and nonelectrical machinery.

Table 4

Canadian composition of merchandise exports to the world and the United States

Exports, by type	Total		U.S.	
	1990	2005	1990	2005
	<i>Percent</i>			
Total exports	100.0	100.0	100.0	100.0
Mineral fuels, oils and other energy	10.0	20.1	11.2	22.8
Natural gas	2.0	8.1	2.5	9.7
Crude oil	3.7	6.9	5.4	8.2
Non-crude petroleum products	1.7	2.7	1.2	3.0
Other mineral fuels, oils, and electricity	2.6	2.4	2.1	1.9
Passenger vehicles and transport trucks	21.5	18.0	28.0	20.7
Passenger cars and trucks	11.1	10.4	14.6	12.2
Auto parts and accessories	4.6	3.7	5.9	4.1
Goods transport trucks	4.8	2.7	6.3	3.2
Other vehicles and trucks	1.0	1.2	1.2	1.2
Wood, paper, and furniture products	16.4	12.0	15.3	11.8
Wood (mostly lumber and composite)	5.0	4.7	3.9	4.9
Paper and paperboard	6.1	3.5	6.8	3.6
Furniture	1.1	1.8	1.4	2.0
Woodpulp	4.2	1.5	2.8	0.8
Other wood products	0.0	0.5	0.4	0.5
Computers, and machinery generating nonelectrical goods and services	8.3	7.8	8.6	7.2
Automotive engines and parts	1.5	1.3	2.1	1.7
Other equipment and computers	6.8	6.5	6.5	5.5
Metals	7.8	7.5	7.7	7.2
Iron and steel	2.5	2.8	2.8	3.0
Aluminum	2.3	2.2	2.2	2.3
Other metals	3.0	2.5	2.7	1.9
Agriculture	6.9	7.0	3.6	5.1
Consumer processed	1.8	3.6	1.6	3.3
Fresh horticulture	0.2	0.4	0.3	0.5
Processed intermediates	1.6	1.2	1.3	1.0
Bulk	3.4	1.8	0.4	0.3
Chemicals and related products	4.3	5.3	3.9	4.7
Plastic and rubber products	2.5	4.2	2.7	4.6
Plastics	1.6	3.3	1.7	3.5
Rubber	0.9	0.9	1.0	1.1
Electrical machinery and appliances	4.7	4.7	5.1	4.1
Aircraft and spacecraft	2.1	2.3	1.9	2.0
Stone and glass	2.3	2.2	1.4	0.6
All other exports	13.2	8.9	10.6	9.2

Source: Global Trade Atlas Canadian Edition and United Nations Statistics Division COMTRADE, extracted from World Integrated Trade Solution (WITS) <http://wits.worldbank.org>.

Table 5

Canadian composition of merchandise imports from the world and the United States

Imports	World		U.S.	
	1990	2005	1990	2005
	<i>Percent</i>			
Total imports	100.0	100.0	100.0	100.0
Passenger vehicles and transport trucks	19.4	17.2	22.9	22.9
Passenger cars and trucks	8.1	6.4	8.1	6.9
Auto parts and accessories	8.2	6.4	10.9	9.6
Goods transport trucks	1.7	2.4	2.3	3.7
Other vehicles and trucks	1.4	2.0	1.6	2.7
Computers, and machinery generating nonelectrical goods and services	18.1	16.4	19.6	7.2
Computers and office equipment	3.9	3.6	4.1	4.8
Automotive engines and parts	2.5	2.3	3.1	4.0
Other machinery	11.7	10.5	15.5	8.4
Chemicals and related products	5.6	8.4	5.9	8.5
Organic chemicals	1.5	1.9	0.8	1.9
Pharmaceutical chemicals	0.6	2.4	0.5	1.6
Other chemical products	3.5	4.1	4.6	5.0
Metals	6.3	7.5	6.8	7.9
Iron and steel	3.3	4.5	3.3	4.7
Other metals	3.0	3.0	3.5	3.2
Electrical machinery and appliances	10.9	9.9	11.0	7.5
Int. circuits, audio-video transmission, and phone equip.	2.7	2.8	2.3	1.6
Televisions, radios, audio-video equip., and rec. sound media	1.9	2.2	1.5	1.4
Other electrical machinery and appliances	6.3	4.9	7.2	4.5
Plastic and rubber products	4.0	5.1	4.8	6.8
Plastics	2.6	3.6	3.3	5.2
Rubber	1.4	1.5	1.5	1.6
Agriculture	6.0	5.9	5.5	5.9
Consumer processed	2.6	2.9	2.1	2.9
Fresh horticulture	1.6	1.3	1.7	1.3
Processed intermediates	1.2	1.1	1.1	1.2
Bulk	0.6	0.6	0.5	0.6
Wood, paper, and furniture products	5.2	5.4	6.4	6.5
Optical, photo, and medical equipment	3.1	3.0	3.3	3.0
Stone and glass	2.4	2.3	2.3	1.9
Textiles	3.9	3.2	1.9	1.7
All other commodities	20.7	24.1	15.5	18.7

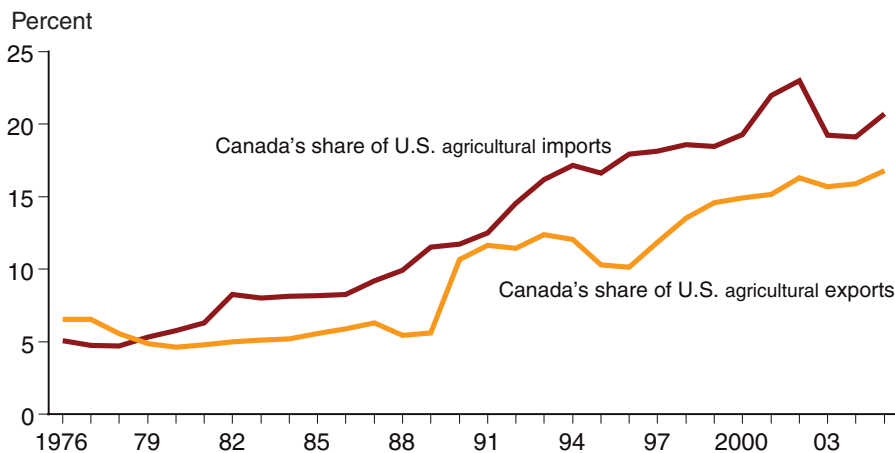
Source: Global Trade Atlas Canadian Edition and United Nations Statistics Division COMTRADE, extracted from World Integrated Trade Solution (WITS) <http://wits.worldbank.org>.

Canadian Agricultural Trade: Exporting Meats and Grains, Importing Fresh Produce

Canada has increasingly become a more important market and source for U.S. agricultural trade (fig. 3). Since 1975, both the import and export shares have about tripled. By 2005, Canada supplied almost 21 percent of U.S. agricultural imports and was a market for 17 percent of U.S. agricultural exports. While Canada was the most important agricultural trading partner with the United States, the United States accounted for a far larger share of Canadian agricultural trade than the reverse. By 2005, the United States supplied almost 60 percent of Canada's agricultural imports and purchased more than 75 percent of its agricultural exports (fig. 4). Further, while the United States has been the dominant supplier of agricultural prod-

Figure 3

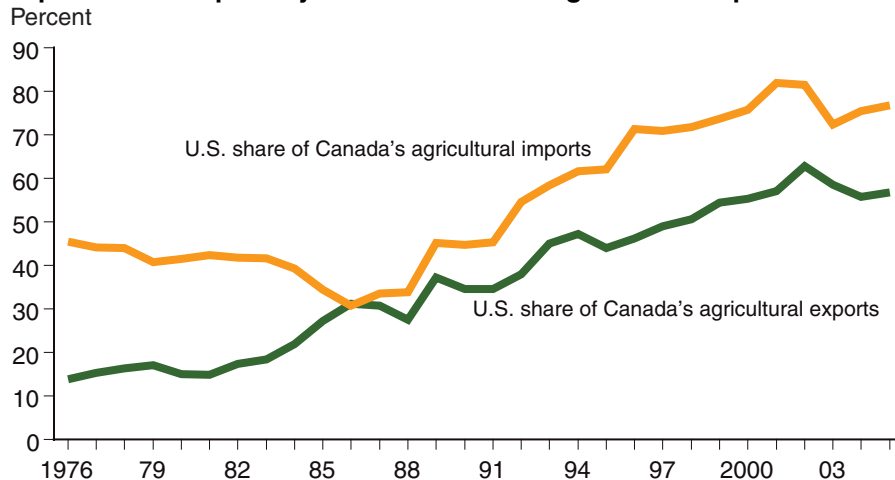
U.S. share of agricultural trade with Canada has increased since 1990



Source: ERS, FATUS Database, June 2006.

Figure 4

The United States is the dominant source for Canada's agricultural imports and the primary destination for its agricultural exports



Source: ERS, FATUS Database, June 2006.

ucts to Canada over the past 30 years, the share of Canadian exports going to the United States has likewise risen dramatically, from slightly over 15 percent to almost 60 percent.

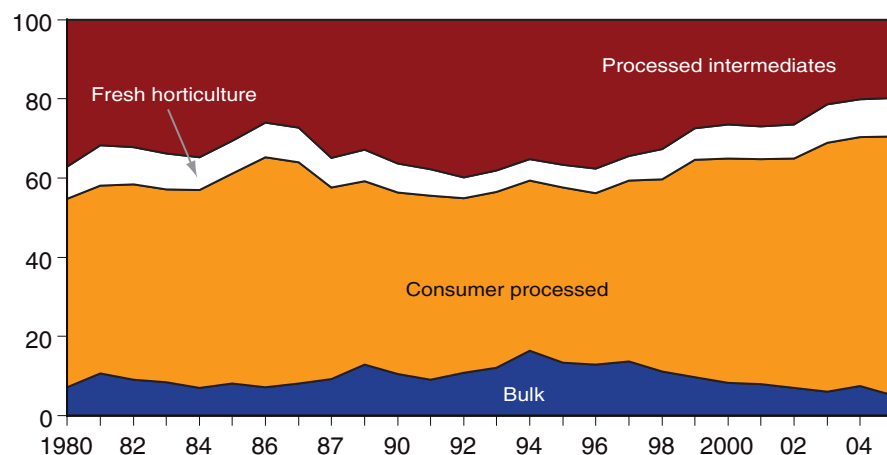
More than 80 percent of Canada's agricultural exports to the United States consist of processed products, most of which are consumer-ready products such as meats and confectioneries (fig. 5). The elimination of the Western Grain Transportation Act in 1994 probably contributed to the increased concentration of consumer processed products evident after 1995.⁵ Consumer processed goods include consumer-ready as well as consumer foods requiring minimal processing. While Canada's total agricultural exports were historically dominated by bulk products, the share of Canadian bulk exports declined from around 65 percent in 1980 to just over 20

⁵For a more complete analysis of the impact of the repeal of the Western Grain Transportation Act, see Langley (2001).

Figure 5

Canadian exports to the United States are primarily processed products

Percent

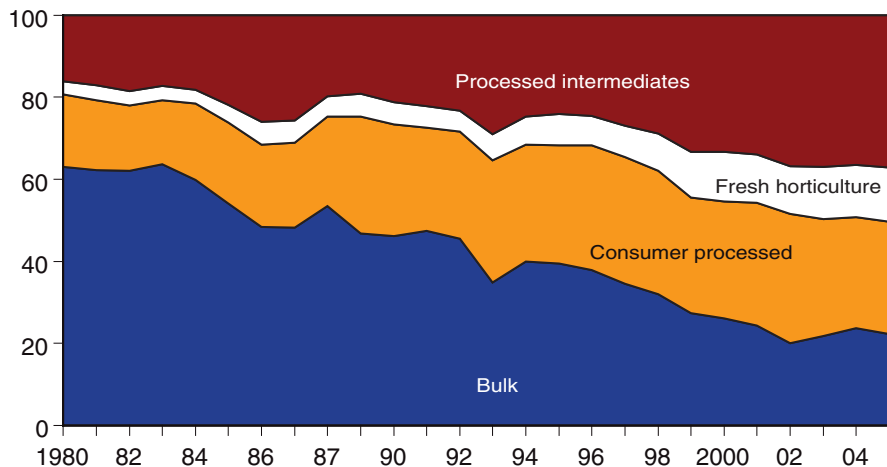


Source: ERS, FATUS Database, June 2006.

Figure 6

Composition of Canadian exports to the world

Percent



Source: UN COMTRADE Dataset, June 2006.

percent in 2005 (fig. 6). Over the same period, processed products have expanded proportionally from around 30 percent of exports to nearly 70 percent. Canada has obviously found a niche in supplying processed agricultural products to both the United States and other countries.

The composition of Canada's agricultural exports to the United States has changed over time (table 6). While Canadian exports to the United States have more than tripled in real value terms between 1989 and 2005, some high-valued exports have shown remarkably high real growth rates. Beef and veal exports have tripled in real value, processed grain products have increased nine-fold, prepared and preserved vegetables have increased more than 6.5 times, and confectionery products increased more than nine-fold. Other beverages (bottled water), dairy products, poultry meat, and prepared fruits, which are less important in the export mix, have shown even more spectacular growth in exports to the United States.

Canada has been a good market for U.S. agricultural products as well (fig. 7). Around 60 percent of U.S. exports to Canada are processed. About 30 percent of U.S. exports to Canada are horticultural produce; Mexico too is increasingly becoming an important supplier of horticultural products to Canada.

Thus, while it is true that the United States and Canada compete in world markets for wheat and some other bulk commodities, most U.S. and Canadian agricultural exports expand the range of products available to consumers in both markets.

Table 6

Canadian exports to the United States, high-growth products

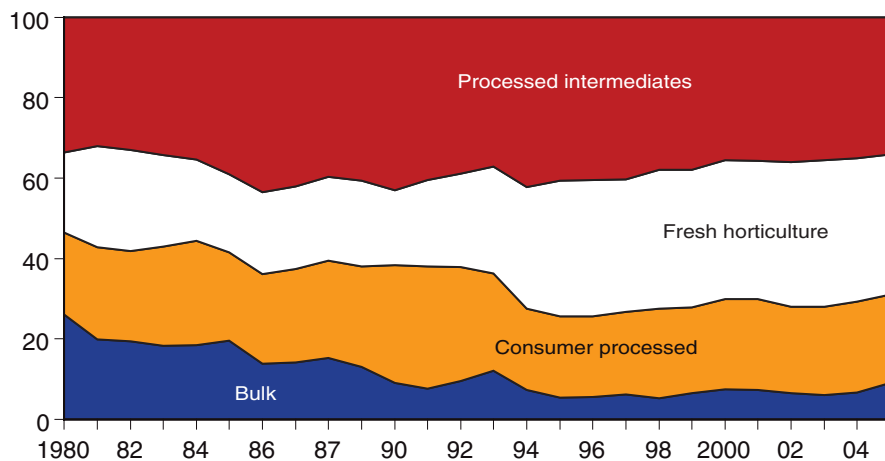
Commodity/ product	Real value of exports		Share of total		Real value growth	Growth relative to total
	1989	2005	1989	2005		
	— Million dollars —		— Share (%) —		— Percent change —	
Total agricultural exports (CIF)	2,928.31	12,267.75	100.00	100.00	318.94	--
Beef and veal	257.97	1074.71	8.81	8.76	316.60	-2.34
Other grains and preparations	66.99	688.03	2.29	5.61	927.08	608.14
Biscuits and wafers	149.89	680.54	5.12	5.55	354.03	35.09
Vegetables--prepared or preserved	66.46	503.89	2.27	4.11	658.24	339.31
Oils and waxes not vegetable based	91.42	347.25	3.12	2.83	279.84	-39.09
Dairy products	20.89	356.55	0.71	2.91	1606.88	1287.95
Confectionery products	33.80	338.60	1.15	2.76	901.74	582.81
Poultry meat	7.25	112.69	0.25	0.92	1454.37	1135.43
Other beverages	7.84	100.00	0.27	0.82	1175.49	856.55
Fruits--prepared or preserved	3.49	55.01	0.12	0.45	1475.86	1156.92
High-growth products' share of total			24.11	34.70		

Source: FATUS Database, ERS, USDA, June 2006.

Figure 7

Composition of U.S. agricultural exports to Canada

Percent



Source: ERS, FATUS Database, June 2006.

Canada's Long-Term Growth Outlook

Once most of the trade-expanding effects of NAFTA have materialized, additional expansion of trade between Canada and the United States will depend more on real growth in these two countries and the real value of the Canadian dollar. Long-term growth refers to trend growth in the economy after the impacts of cyclical, seasonal, and irregular variation are removed. In the short and intermediate term, economic growth is impacted by economic shocks, such as energy, and financial market shocks, which can have sizeable impacts on short-term growth but whose influence diminishes over time. Thus, economic growth over intervals greater than 3 to 5 years is dominated by the long-term trend in labor hours worked and labor productivity.

Strong Canadian economic growth translates into increased Canadian demand for U.S. exports and fosters expanded trading opportunities between Canada and the United States. Strong Canadian growth prospects enhance the willingness of U.S. firms to devote additional resources to the production and distribution of U.S. goods and services in Canada. In part because of trade liberalization and strong Canadian growth, foreign direct investment in Canada was 4.7 times higher in 2005 than in 1990. Over 50 percent of the increased foreign direct investment came from the United States. The United States is likely to maintain or increase its comparative advantage in the production of and investment in high-tech capital goods, allowing further U.S. export expansion of these goods. Increased trade benefits consumers in both countries by providing a greater variety of goods at lower prices.

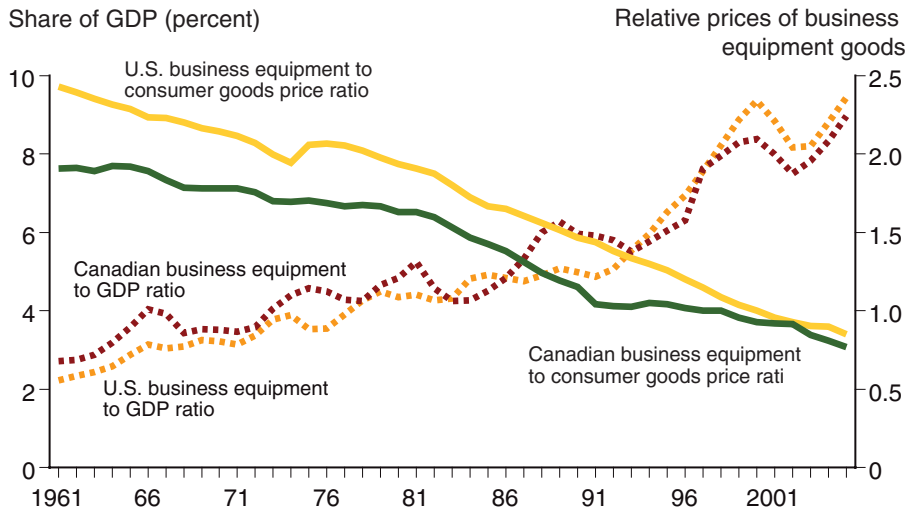
Canadian long-term potential GDP growth is about 3 percent. Canada's proximity to the open trade borders with the United States provides a large market for its exports as well as an important source of capital and industrial goods that facilitate Canadian production. Other factors underlying Canada's favorable long-term growth outlook are continued moderate growth in population (1.3 percent) and labor productivity (1.4) percent. Additional growth in labor force participation of approximately 0.3 percent is expected as more women and immigrants continue to enter the labor force. Canadian productivity growth has received a large boost from the large share of its GDP devoted to business equipment investment and its highly educated workforce. Growth in annual real business equipment spending of nearly 8 percent since the mid-1990s has increased the productive capital stock of Canada and encouraged growth in both labor and multi-factor productivity.⁶

In 2005, Canadian investment in business equipment was 9 percent of real GDP compared with a 1960s average of 3.3 percent (fig. 8). As in the United States, Canada's business equipment investment share of GDP is receiving a long-term boost from falling business investment prices relative to consumption goods. The long-term investment outlook for Canada is also strengthened by favorable long-term growth prospects for the United States, its major trading partner.

⁶A more detailed analysis of Canada's long-term growth outlook using growth accounting analysis is presented in the Appendix to this report.

Figure 8

Falling prices for business equipment have raised the investment shares of GDP



*Relative price ratios set equal to 1 in 1997 for Canada and 1 in 2002 for the United States.

Source: Statistics Canada and Bureau of Economic Analysis. Statistics Canada data may be found at <http://www.statcan.ca/english/nea-cen/data/index.htm> while BEA data may be found at <http://www.bea.gov/bea/dn/home/gdp.htm>.

When productivity growth falls, growth in labor hours worked often increases, as firms hire more staff and expand the average workweek to meet growth in demand. Over the 2003-2005 period, a tighter Canadian labor market was reflected by a 2.5-percent annualized increase in total hours worked. That increase in hours was generated primarily by a fall in the unemployment rate from 7.6 to 6.8 percent and a longer work week. Over this period, the percentage of the labor force employed full-time increased from 74.9 percent to 76.1 percent. Productivity growth fell in 2003-2004 due to negative shocks from the Severe Acute Respiratory Syndrome (SARS) health crisis, the Ontario electrical blackout, and the discovery of bovine spongiform encephalopathy (BSE, also known as mad cow disease) that interrupted cattle and beef production and exports.

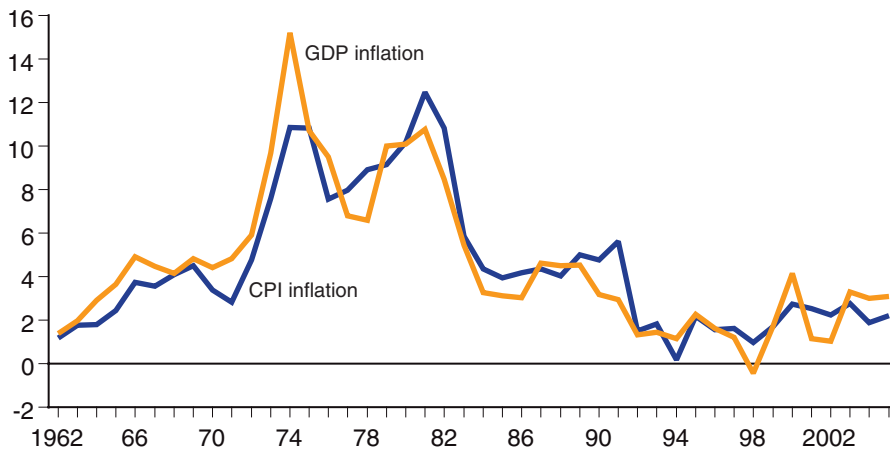
In 2005, business labor productivity growth rebounded to 1.7 percent, which was above its long-term trend rate of 1.4 percent. Over 2006 and 2007, productivity will likely remain at or above long-term trend as the impacts of the negative productivity shocks of 2003 and 2004 diminish, employment growth slows, and growth in Canadian business investment remains high. However, productivity growth is not expected to rebound to the 2.5-percent level of 1997-2002. Expected continued labor market tightening and expected tighter monetary policy, both in Canada and the United States, coupled with the lagged trade impact of the sharply higher Canadian dollar, will moderate Canadian productivity and real growth in 2006 and 2007.

Canada's long-term growth outlook is enhanced by its low rate of inflation and relatively mild business cycles over the past two decades. Between 2000 and 2005, inflation, as measured by the GDP deflator and the consumer price index (CPI), averaged approximately 2.5 percent per year (fig. 9). Low rates of inflation (3 percent or less) and inflation volatility reduce economic inefficiencies, thus lowering the cost of capital and allowing markets to

Figure 9

Canadian inflation has remained low since the early 1990s

Percent



Source: Statistics Canada. (<http://www40.statcan.ca/l01/cst01/econ46a.htm> and <http://www40.statcan.ca/l01/cst01/econ06.htm>).

function more efficiently. Canada's post-1985 history of mild business cycles (infrequent recessions of moderate depth and duration) has further lowered the general default risk and capital costs, enhancing the long-term Canadian outlook. Canada's last two recessions (in 1990-91 and 1981-82) were moderate in terms of depth and duration. Canada's economy should also receive a significant near-term boost from likely strong (near 3.5 percent) U.S. growth in 2006.

The Canadian economy benefits from being a net energy exporter of both crude petroleum and natural gas. In 2005, Canada had a \$61-billion surplus in mineral fuels and other energy sources, with most of the surplus in natural gas and crude oil production. Being a net exporter of petroleum and natural gas reduces Canada's sensitivity to worldwide energy price shocks that contain large increases in both oil and natural gas prices. In times of high energy prices, the Canadian economy benefits from larger trade surpluses in energy goods and higher equity prices and investment spending by Canadian energy firms. These positive energy sector influences soften the negative impacts on Canadian growth of slower world growth and higher domestic inflation resulting from worldwide energy price supply shocks (Szadurski).

Overall Canadian Economy Not Greatly Hampered by Stronger Canadian Dollar

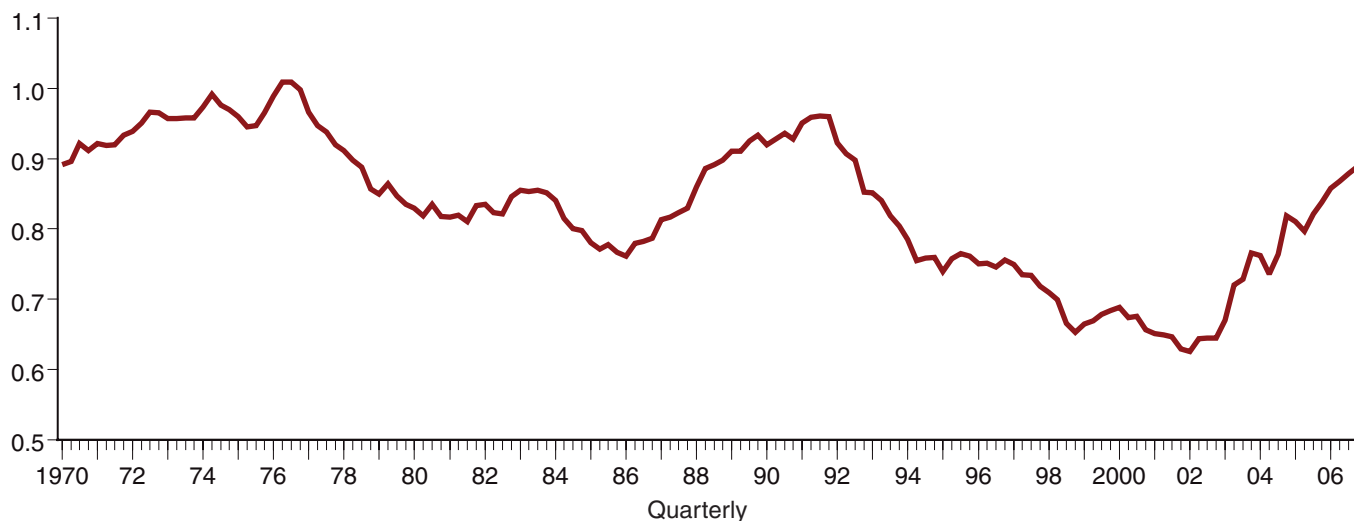
The Canadian economy has weathered the effects on trade and overall economic growth of the strong appreciation in the Canadian dollar since 2002. The stronger value of the Canadian dollar has been felt primarily in slower growth in primary commodities exports, such as wood pulp and wheat, and through greater import penetration, especially in the automotive, industrial, and electrical machinery areas. The exchange rate effects of the stronger Canadian dollar have been largely offset by strong growth in Canadian domestic demand, modest price increases in Canadian exports, and strong growth of its primary trade partner, the United States. In addition, the lower price of Canadian imported goods brought about by the stronger Canadian dollar has encouraged lower overall inflation and lower costs of imported capital goods, thus improving the intermediate term productivity outlook. Further expected moderate appreciation in the Canadian dollar is not expected to cause significant deterioration in the intermediate- to longer-term Canadian outlook.

Between January 2002 and February 2006, the real trade-weighted Canadian dollar appreciated 27.2 percent, with two-thirds of that increase taking place between January 2002 and December 2003 (fig. 10). Despite that appreciation, the real trade-weighted dollar remains low by long-term standards. The strengthening Canadian dollar has had only a modest impact on the competitiveness of most Canadian goods and service exports. The combined effects of the stronger Canadian dollar, the SARS epidemic, and BSE-induced restrictions on cattle and beef exports slowed growth in real Canadian exports to a 1-percent annualized rate over 2002 and 2003. However, with a slower rate of appreciation in the dollar since 2004, stronger world growth,

Figure 10

Real Canadian exchange rate has risen significantly since 2002

\$U.S. per Canadian dollar



Source: ERS Exchange Rate Data Set. Quarterly average of monthly observations.

(<http://www.ers.usda.gov/Data/ExchangeRates/Data/RealMonthlyCountryExchangeRates.xls>).

increased travel by foreigners in Canada (with the end of the Canadian SARS crisis), and the easing of restrictions on Canadian beef and cattle exports, Canadian real exports grew at a 3.7-percent annualized rate over 2003-05.

Overall, Canadian export competitiveness has been aided by small increases in Canadian export prices that have partially offset the much stronger Canadian dollar. Aggregate Canadian export prices rose 3 percent from 2002 through 2005. The small increase in Canadian export prices was achieved despite sharply higher prices for Canadian energy exports. The stronger Canadian dollar has forced Canadian exporters to accept smaller profit margins to maintain international competitiveness and market share. Exports and profit margins expanded rapidly in the 1993-2002 period, when the Canadian dollar trended sharply downward. The expanded exports and foreign market share gained in those highly profitable times will be defended by continued relatively modest price increases, even if the Canadian dollar continues to appreciate moderately as expected. Expected future gains in Canadian productivity should further lessen price pressures on Canadian export prices.

Real Canadian imports grew at an annualized 6.4-percent rate over the 2002-05 period. The strong import growth reflected solid income growth and the stronger Canadian dollar. Canadian real final domestic demand grew at an annualized rate of 4 percent in this period, providing strong income growth to fuel the expansion of Canadian imports of business equipment, consumer durables, and higher priced processed food items. Canadian import prices fell 9.9 percent in the period as the stronger Canadian dollar allowed importers to lower import prices in terms of Canadian dollars. The combination of strong domestic income growth and the stronger Canadian dollar caused the trade surplus, in terms of real net exports, to fall from C\$58.7 billion in 2002 to C\$2.1 billion in 2005. However, because of the improvement in the Canadian terms of trade (price of exports relative to the price of imports), Canada's nominal trade surplus rose from C\$50.4 to C\$54.3 billion. The rise in Canada's nominal trade surplus coupled with the favorable short-term and long-term outlook for the Canadian economy indicates likely continued upward pressure on the Canadian dollar.

Despite the appreciation in the Canadian dollar since 2002, Canada's merchandise trade surplus with the United States has widened by \$44.2 billion since then, with \$32.9 billion of the rise in the trade surplus occurring in the energy area. The widening Canadian trade surplus indicates that additional appreciation in the Canadian dollar relative to the U.S. dollar will likely be required to significantly diminish Canada's trade surplus in the intermediate term, especially in the less volatile nonenergy areas. The nominal Canadian dollar appreciated 6.9 percent against the U.S. dollar in 2005. Continued appreciation in the Canadian dollar is expected in 2006, but at a somewhat slower rate.

Negative Factors in the Short-Term Canadian Growth Outlook

Five factors that boosted Canadian growth since 1995 have become, or are expected to become, less favorable. First, as discussed in the previous section, the Canadian economy cannot expect large-scale depreciation in the Canadian dollar as a source of economic growth over the intermediate term. Over the 1990–2002 period, the Canadian real trade-weighted dollar, as measured by J.P. Morgan, depreciated nearly 23 percent. The dramatically weaker Canadian dollar helped boost Canada's net export share of real GDP from 0.5 percent in 1990 to 5.1 percent in 2002. The 14.1-percent appreciation in the real Canadian dollar over the 2003–2005 period contributed to the shrinking of the real trade surplus to 2 percent of GDP in 2004 and to 0.2 percent in 2005. The deterioration in trade competitiveness was especially pronounced in the wood pulp, wheat, automotive, industrial, and electrical machinery areas. The Canadian dollar is likely to continue to appreciate moderately in 2006 under the weight of continuing large trade surpluses with the United States and the rest of the world.

Second, real wage demands are rising and are likely to rise at a faster pace over time in response to the higher trend rate of worker productivity since 1995. Canadian labor productivity accelerated after 1995, although not as strongly as in the United States. High Canadian productivity growth lowered growth in unit labor costs, raising profitability, encouraging stronger business investment and employment growth, and fostering low inflation. However, as argued by many economists, real wage demands will eventually rise in response as workers raise their perceptions of their long-term trend productivity growth and as labor markets tighten.⁷ As real wage demands increase in excess of productivity gains, employment and GDP growth will slow. Growth in Canadian hourly labor compensation and unit labor cost picked up significantly in 2005 with increases in wages rising to 4.4 percent from 1.1 percent and unit labor costs rising to 2.3 percent from 1.4 percent.

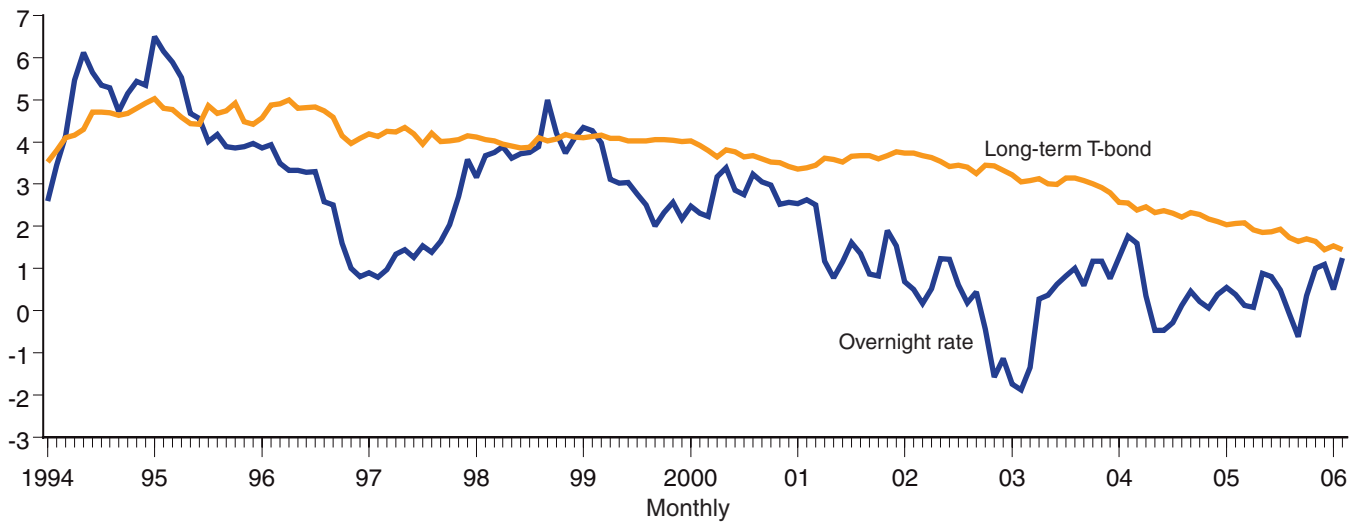
Third, Canadian interest rates have been very low by historical standards but are likely to be under significant upward pressure (fig. 11). Low real Canadian interest rates have been generated by the accommodative monetary policies of many central banks (including those in Canada, the United States, Japan, and the European Union) and soft aggregate demand in many industrialized countries in recent years. However, the U.S. Federal Reserve and the Canadian central bank (Bank of Canada) are now in the tightening phases of their monetary policy. Specifically, the Federal Reserve began raising its Federal funds rate target in June 2004 and the Bank of Canada followed in September 2004. The Bank of Canada raised its interbank overnight interest rate target from 2.0 percent in September 2005 to 3.75 percent in March 2006. Given that the Canadian economy is operating at or near full capacity, while Canadian real interest rates remain low by historical standards, upward pressures on inflation signal the likelihood of additional tightening by the Bank of Canada in 2006. Growth in domestic demand is expected to remain somewhat above long-term trend while most Canadian exports remain price competitive on world markets despite the much stronger Canadian dollar. The sharpest rise in the Canadian dollar was

⁷For a more detailed explanation of this argument see Ball and Mankiw (2002) and Eller and Gordon (2002).

Figure 11

Canadian real interest rates are low by historical standards¹

Percent



¹Inflation-adjusted Canadian Real Return T-Bonds and nominal overnight money market financing rate minus CPI inflation over previous year. The T-bond is the inflation-adjusted long-term benchmark bond.

Source: Bank of Canada (<http://www.bankofcanada.ca/en/rates/index.html#interest>).

the 8-percent rise (in real terms) in 2003, but its impact on real Canadian economic growth is diminishing.

Fourth, as in the United States, Canadian consumer spending has been boosted by a reduction in the personal savings rate; it is not likely to fall much further. The Canadian savings rate out of personal disposable income fell to -1.2 percent in 2005, compared with 9.5 percent in 1994. The 8.1-percent rise in the Canadian household wealth-to-income ratio over this period suggested a much smaller fall in the Canadian personal savings rate than what actually occurred. The savings rate has also been under downward pressure from the 2000-2004 residential construction boom and low real interest rates. Growth in residential construction slowed significantly in 2005 and is expected to slow further in 2006, especially if mortgage rates rise as expected. Thus, the low personal savings rate and strong growth in Canadian consumption is vulnerable to rising interest rates and slower growth in residential construction spending over the next 2 years.

Fifth, an additional concern is the vulnerability of the Canadian economy to the U.S. business cycle, especially U.S. recessions. Since 2000, Canadian exports to the United States have accounted for between 27 and 33 percent of nominal Canadian GDP. The 1995-2000 U.S. economic boom helped generate real Canadian GDP growth averaging 4 percent per year during that period. A major slowdown in U.S. growth, coupled with an appreciating Canadian dollar, would significantly slow Canadian growth.

Fortunately, the impact of a U.S. economic slowdown on the Canadian economy, while potentially substantial, is probably less likely than usual. Canada is most susceptible to a U.S. economic slowdown when Canadian domestic demand is growing slowly or contracting. While U.S. economic growth is expected to remain strong through 2006, a repeat of the late 1990s

economic boom appears unlikely. Strong U.S. growth will allow continued growth in Canadian exports despite a likely continued rising Canadian dollar. Moreover, growth in Canada's real domestic demand is expected to remain strong: real final domestic demand in Canada grew by 4.3 percent in 2005 after growing by 3.9 percent in 2004. Such strong growth in final demand in recent years and high levels of existing labor and capital utilization point toward continued strong growth in employment, personal disposable income, consumption, and business capital spending in 2006.

Canadian Economic Conditions Will Remain Important to the United States

Canada will remain the United States' most important trading partner for at least the next decade. Canada's economic conditions, growth prospects, and the competitiveness of the Canadian dollar strongly influence U.S. exports to Canada. Canada is an extremely important market for U.S. exports of motor vehicles and parts, computers and electronic products, nonelectrical machinery, chemicals, metals, and agricultural products including fresh vegetables and fruit, oilseed products, feed grains, poultry products, fruit juices, beef, and sugar products. Canadian exports of business equipment, automotive and truck parts, metals, and chemicals compete against similar U.S. products in both U.S. and world markets. Likewise, Canadian agricultural exports of wheat, beef, pork, and cattle compete with U.S. agricultural products in both U.S. and world markets. NAFTA has expanded the importance of both agricultural and nonagricultural trade between the two countries.

The intermediate and long-term outlook for Canada is favorable and should further boost trade between the two countries. Like the United States, Canada has benefited from strong productivity growth since 1995. Canada's potential GDP growth is about 3 percent per year. Productivity and business investment spending will continue to receive boosts from falling relative prices for business investment goods and increasing use of information technology. Rising labor force participation and increasing labor quality are additional sources of growth for the Canadian economy. Canada's achievement of low inflation and relatively mild business cycles over the past two decades provides a favorable financial environment for growth. The stronger Canadian dollar has not dampened overall Canadian growth, and the economic risks to the Canadian economy appear lower than normal given its strong growth in domestic demand, high utilization of existing labor and industrial capacity, strong growth in corporate profits, and favorable growth outlook for the United States, its primary trading partner.

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Appendix: Canada's Longer-Term Growth Outlook: A Growth Accounting Analysis

Canada's potential long-term growth may be broken into its labor supply and productivity components. Aggregate demand fluctuations affect short-term economic growth and longer term growth by influencing long-term capital costs through their impact on business-cycle risk premiums that are embedded in returns demanded by investors in business debt and equity securities. However over the intermediate to longer term, economic growth is primarily determined by growth in the supply of labor and productivity. The supply of goods and services produced may be represented by the following relationship:

$$(1) \text{ GDP} = \text{Working-Age Population} * (\text{Labor Force} / \text{Working Age Population}) * (\text{Employed Workers} / \text{Labor Force}) * (\text{Hours} / \text{Employed Workers}) * \text{GDP/Hours}$$

Thus, GDP can be decomposed into the following components: (1) a country's working-age population, (2) the percentage of the working-age population in the labor force (the labor force participation rate), (3) the percentage of the labor force that is employed (the employment rate), (4) the average hours worked per employee, and (5) GDP produced per hour (total economy labor productivity). Because the equation is multiplicative in levels, the growth rate in GDP is simply the sum of the growth of these components.

Labor hours worked reflects the interaction of supply and demand factors. Short-term changes in labor demand primarily affect the employment rate and the average hours worked, while, over the long term, changes in employee hours are primarily determined by changes in population growth and, to a lesser extent, changes in labor force participation. Growth in labor productivity is generated by growth in the quality of labor, the amount of capital per worker, the intensity that labor is employed, and growth in technology or total factor productivity. Total factor productivity allows increased economic output for any given level of labor and capital usage. A highly readable overview and an application of growth accounting of labor supply and productivity in the United States may be found in McNees (1991).

Hodrick-Prescott trend analysis is used in this paper to derive estimates of trend Canadian potential GDP growth.¹ The trend analysis indicated that long-term growth in Canadian labor hours is contributing 1.9 percent to trend Canadian GDP growth while labor productivity is contributing 1.4 percent to trend GDP growth. Trend growth in multifactor productivity was found to be 1.5 percent, indicating virtually all productivity growth was achieved through technological progress. According to Coulombe, Canada is likely overestimating its multifactor productivity by underestimating its labor and capital stock inputs.

Judgment is necessary in using trend analysis since factors that generated the recent trend estimates may not persist. In the case of Canada, it is likely that a stronger Canadian dollar (especially relative to the U.S. dollar), rising real wage demands, rising real interest rates, slower future growth in consumer and

¹The Hodrick-Prescott filter estimates the trend component of a series by penalizing sharp changes in the underlying trend in the series. Specifically, the filter minimizes the variation of a variable around its trend, subject to a smoothing constraint on the changes in the estimated trend. The filter requires the user to supply the smoothing constraint parameter where a higher value for the smoothing parameter produces a smoother more linear trend. The Hodrick-Prescott filter is a versatile filter in that numerous small breaks in the underlying trend are allowed. A relatively high smoothing factor of 1,000 was chosen for supply factors related to trend growth rates in population, labor participation, employment rate, and productivity. From an economic standpoint, the underlying long-term trend in these variables should change relatively slowly over time. For a discussion of the Hodrick-Prescott filter and the appropriate choice of smoothing parameters, the reader should refer to Ball and Mankiw (2002) and Hodrick and Prescott (1997).

residential spending, and slower growth in the United States relative to the late 1990s will lower the Canadian long-term growth outlook. These factors slowing Canadian growth should be partially offset by expected strong long-term growth in business investment, which will likely generate moderate to strong productivity growth, and an expected slower decline in the average work week. Overall, the judgmental factors lowered the Canadian growth estimate by 0.3 percent, producing an adjusted long-term growth estimate of 3 percent. This estimate is consistent with the Bank of Canada's long-term potential growth estimate of 2.75 to 3.25 percent.² The strong long-term Canadian growth estimate is also consistent with a long-term U.S. potential growth estimate of around 3.2 percent (Moore, 2005), which should stimulate moderate to strong growth in Canadian exports to the United States and encourage continued strong Canadian investment.

The next two sections examine the trend labor supply and productivity growth estimates produced by the Hodrick-Prescott filter in greater detail. In addition, economic factors influencing the trend growth components are discussed in more detail.

Labor Supply's Contribution to Growth

As stated above, the Hodrick-Prescott trend analysis indicated that growth in labor hours is contributing 1.9 percent to long-term Canadian GDP growth while growth in labor productivity is contributing 1.4 percent. It is useful to break the growth in labor hours into its four growth components: (1) working-age population, (2) labor force participation, (3) percentage of labor force employed, and (4) average hourly work week. Growth in trend Canadian labor hours was decomposed into a 1.3-percent growth in trend working-age population, 0.3-percent growth in trend labor force participation, 0.4-percent rise in the trend rate of employment, and a 0.1-percent fall in average hours worked. The breakdown is useful since some forms of labor growth, such as working-age population, tend to be more stable over time. Growth in the employment rate and growth in the average work week tend to be more influenced by business cycles. Growth in the employment rate is bounded by the long-term NAIRU (non-accelerating inflation rate of unemployment). In the absence of major supply and demand shocks, major demographic and cultural changes, or approaching binding supply constraints, trend-adjusted labor force participation rates, labor force employment rates, and the average work week should be relatively stable over the intermediate term.

Canada, like the United States, has experienced sharply lower population growth over the last 40 years (app. fig. 1). Since 1995, Canada's working-age population growth has varied between 1.1 and 1.5 percent. Smoothing the data with the Hodrick-Prescott filter indicated that trend population growth for Canadians 15 years and older has stabilized at approximately 1.3 percent. Canada's low birth rate and the relatively low percentage of children in the population indicate continued slow growth in the working-age population over the foreseeable future. Immigration is the major source of growth in the working-age population. From 1991 to 2001, immigration exceeded emigration by over 220 percent and net immigration (immigration less emigration) represented 54 percent of population growth for the period.

²Bank of Canada (Gordon Thiessen et al.), *Monetary Policy Report*, November 2000, p. 17.

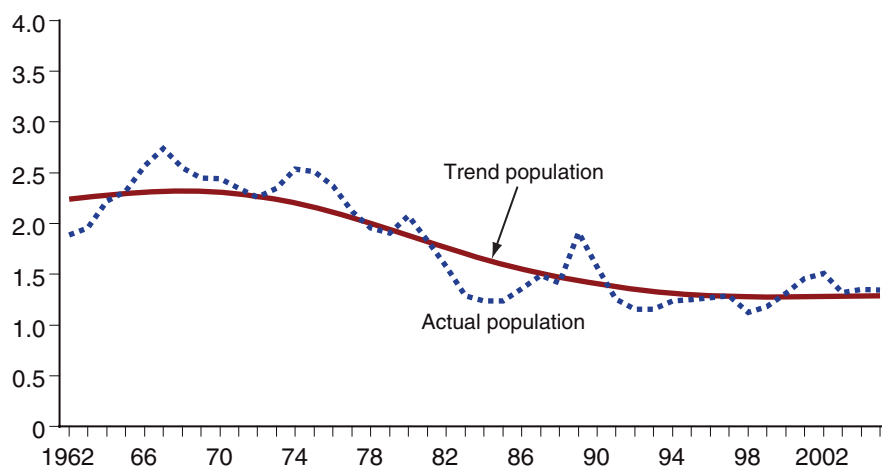
Nearly 60 percent of immigration over the period was from Asia and the Middle East. Immigration will likely continue to be a major source of population growth for the foreseeable future.

From 1996 to 2003, labor force participation trended upward (app. fig. 2). However, in the last 2 years, growth in labor force participation slowed a bit. Part of the reason for the slower growth in labor force participation is likely Canada's extreme dependence upon immigration in supporting its population growth. In 2005, net immigration contributed 70 percent to Canadian population growth. Given that immigrants (at least initially) are likely to have lower labor participation rates, Canada's high rate of net immigration is likely holding down labor force participation rates.

Appendix figure 1

Growth in Canada's working age population moderate and stable since the mid-1990s¹

Percent



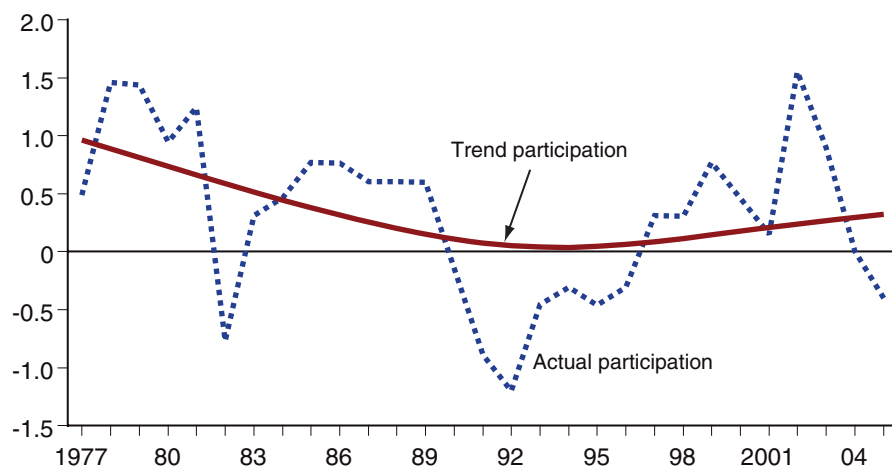
¹Working age population is defined as 15 years old and older.

Source: Statistics Canada (<http://www40.statcan.ca/l01/cst01/econ10.htm>).

Appendix figure 2

Canada's labor force participation trending upward since 1996

Percent



Source: Statistics Canada (<http://www40.statcan.ca/l01/cst01/econ10.htm>).

Labor force participation depends upon numerous factors including employment and retirement opportunities, the age distribution of workers, and cultural standards concerning the employment of women and children. Canadian labor force participation has rebounded significantly since its deep trough caused in large part by the 1990-1991 recession. The overall rising quality of the Canadian labor force and the tightening of Canadian labor markets in recent years are expanding the employment opportunities of Canadians and will tend to increase labor force participation. The expanding pool of workers entering Canada from abroad will likely generate an increase in labor force participation rates over time as they are fully acclimated to the Canadian labor markets. However the continued aging of the Canadian population will tend to place downward pressure on labor force participation.

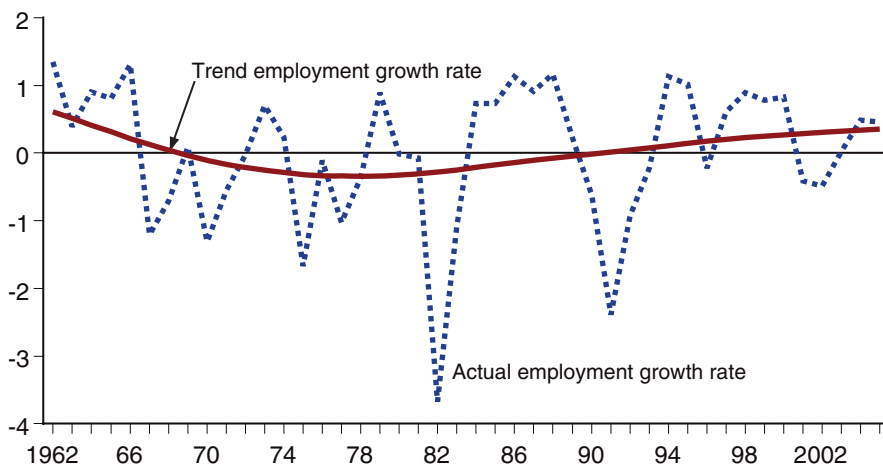
Canada's labor force participation rate reached a historical high of 67.5 percent in 2003 and 2004 before falling to 67.2 percent in 2005. Labor force participation peaked for women in 2004 before falling in 2005. Labor force participation rates have natural ceilings especially for secondary family wage earners such as women and children. Thus while the trend growth in labor force participation was estimated to be 0.3 percent, the actual trend growth rate is likely to be lower.

Since the mid-1990s, growth in Canada's employment rate has contributed strongly to Canadian economic growth. From 1994 to 2005, Canada's unemployment rate fell from 10.4 percent to 6.8 percent. The Hodrick-Prescott filter indicated that the growth in the rate of Canadian employment is contributing approximately 0.4 percent to Canadian growth (app. fig. 3). However, future declines in the unemployment rate will be more difficult to achieve. The 6.4-percent unemployment rate for February 2006 is the lowest since 1974 and is at or below the lower bound of most empirical estimates of the Canadian NAIRU (non-accelerating inflation rate of unemployment). Canadian manufacturing capacity utilization is also high by historical standards. High levels of resource utilization are putting upward pressure on inflation which is being held down by the stronger Canadian dollar. As

Appendix figure 3

Growth in the employment rate has added to Canada's growth

Percent



Source: Statistics Canada (<http://www40.statcan.ca/101/cst01/econ10.htm>).

mentioned earlier, growth in wages and unit labor costs picked up significantly in 2005.

The average Canadian work week has trended downward over most of the last four decades, although the trend has been less pronounced since the early 1990's. The slight downward trend reflects the long-term trends of rising share of part-time employment since the mid-1990's and a shorter work week in general for most full-time workers (app. fig. 4). Cyclically, the average work week tends to expand in strong expansions and contract in recessions. The trend decline in the average work week was measured at 0.1 percent for 2005. Strong productivity growth also tends to shorten the average work week since a given level of output can be produced with fewer labor hours. In 2003, however, the average work week for the year fell by a very large 1.7 percent before rebounding 1.0 percent in 2004 and 0.7 percent in 2005. The unusually large fall in the average work week in 2003 was primarily due to unfavorable economic shocks including SARS (Severe Acute Respiratory Syndrome), BSE (bovine spongiform encephalopathy), the large August Ontario electrical power outage, and below-average weather. Current tight labor markets and the associated hiring of a greater proportion of full-time workers should lengthen the average work week in 2006.

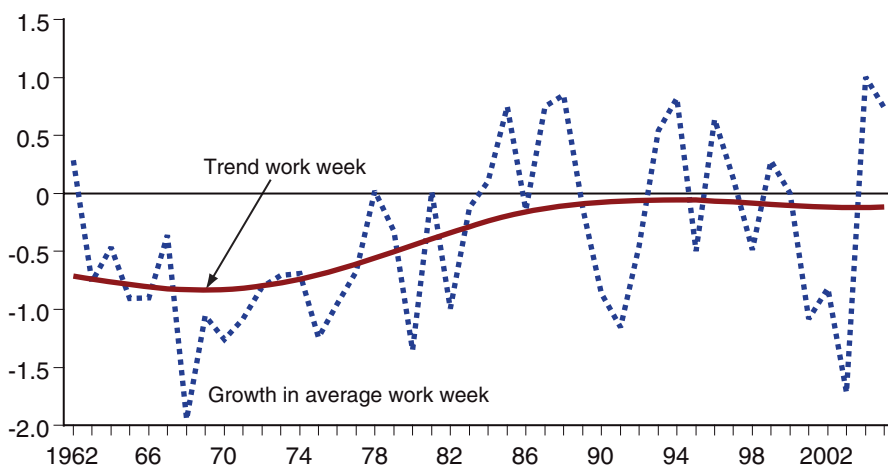
Productivity's Contribution to Growth

Productivity growth can be measured as labor productivity or multifactor productivity. Labor productivity is the broadest productivity measure and measures average real output per unit of labor input, typically a labor hour. Labor productivity is the broadest productivity measure in that it depends upon the quality and intensity of labor usage, the amount, quality, and intensity of capital usage per worker, and the rate of growth in multifactor productivity. Multifactor productivity measures the impact of changing technology on output. Gains in multifactor productivity allow the increased production of all goods and services at any given level of labor and capital

Appendix figure 4

Average Canadian work week has trended downward since the mid 1990's

Percent



Source: Statistics Canada (<http://www40.statcan.ca/01/cst01/econ10.htm>).

usage. Total factor productivity is derived by subtracting from labor productivity the impact on labor productivity of changes in labor quality and the impact on labor productivity of changes in the quality adjusted capital stock.

Long-term growth in labor productivity depends on improving worker quality and the long-term quality and quantity of capital per worker. Gu, Kaci, Maynard, and Sillamaa (2002, p. 90) found that, from 1995 to 2000, improving labor quality contributed 18 percent to growing business sector labor productivity. During this period, business capital spending averaged a very high (by historical standards) 11.9 percent of real GDP. High rates of business investment spending raise the quantity and quality of the capital stock and improve the likelihood of future economic growth from economic specialization, invention, and innovation. As pointed out by Romer (1987), continued economic specialization brought about by high levels of investment spending is an important source of long-term productivity growth.

Both productivity measures have their advantages and disadvantages. Labor productivity is available with less time delay and is subject to fewer measurement problems since labor quality and capital quantity and quality are not directly measured. Total factor productivity may be a better indicator of long-term growth trends in productivity than labor productivity, but is dependent on how labor and capital quality and quantity are measured. In the case of Canada and the United States, differences between BLS and Statistics Canada in their measurement of their effective labor supply and capital stock make interpreting multifactor productivity differences between the two countries very difficult.

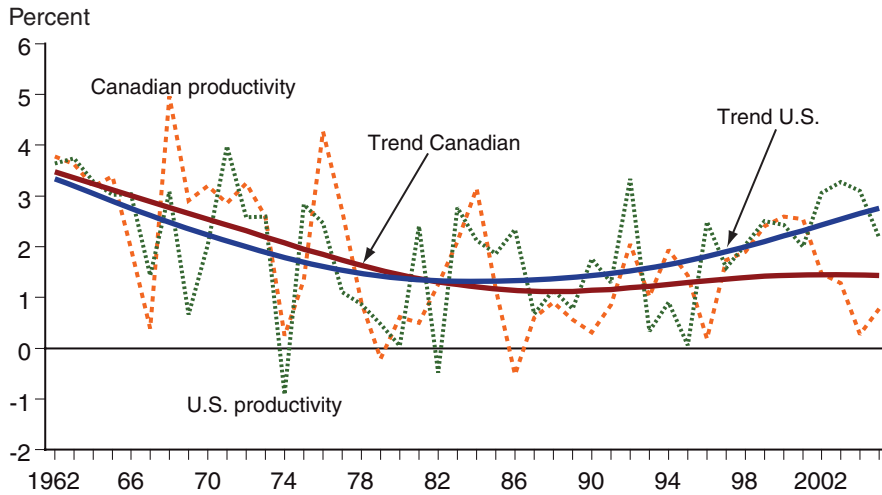
Labor Productivity

Since 1995, trend labor productivity growth has been roughly flat in Canada, while trend productivity growth in the United States has accelerated. Both countries observed strong above-trend productivity growth from 1995 to 2001. After 2001, however, productivity growth in Canada slowed, while productivity growth accelerated in the United States. Specifically, trend economy-wide labor productivity (real GDP divided by total labor hours worked) for the Canadian economy rose from 1.3 percent in 1995 to 1.4 percent in 2005 (app. fig. 5). The deviation in trend business labor productivity was even more pronounced for measured business sector productivity. Trend Canadian business sector labor productivity fell from 1.4 percent in 1995 to 1.3 percent in 2005 while trend U.S. business productivity rose from 2.1 percent to 3.4 percent over the period (app. fig. 6).

Growth in Canadian productivity relative to the United States after 2000 has been down because of weaker growth in Canadian aggregate demand, stronger growth in Canadian employment, and greater U.S investment in information processing equipment. Specifically, growth in Canadian aggregate demand has been held down by slower growth in Canadian exports due to the stronger Canadian dollar and the U.S. recession and mild economic recovery until 2004. Canadian productivity rebounded in 2005 and likely will continue to strengthen in 2006 in light of tight labor markets and continued strong growth in business investment and domestic final demand.

Appendix figure 5

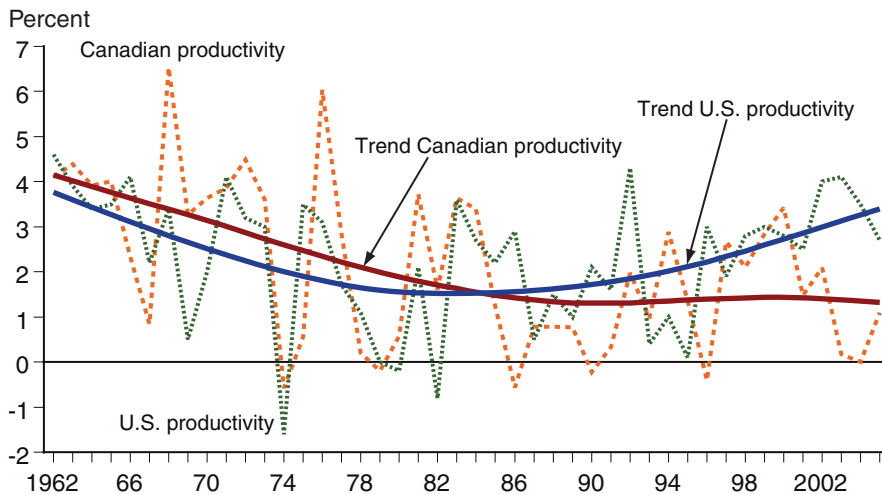
Overall Canadian labor productivity below U.S. level since the early 1980s



Sources: Statistics Canada and Bureau of Labor Statistics. Statistics Canada productivity data may be found in Table 383-0012 at http://cansim2.statcan.ca/cgi-win/cnsmcgi.exe?Lang=E&RootDir=CII&ResultTemplate=CII/CII_PICK&Version=2&Array_Pick=1&ArrayId=383-0012&C2USER=&C2PASS=. BLS productivity series is unpublished but available at <ftp://ftp.bls.gov/pub/special.requests/>.

Appendix figure 6

Growth in Canadian business sector labor productivity has been below U.S. level



Sources: Statistics Canada and Bureau of Labor Statistics. The Statistics Canada series may be found at CANSIM Labor Productivity Measures 383-0008, http://cansim2.statcan.ca/cgi-win/cnsmcgi.exe?Lang=E&RootDir=CII&ResultTemplate=CII/CII_PICK&Version=2&Array_Pick=1&ArrayId=383-0008&C2USER=&C2PASS=. The BLS series is available at <http://data.bls.gov/cgi-bin/surveymost?pr>.

As stated earlier, the Canadian and U.S. equipment share of GDP has been trending upward since the 1960s (app. fig. 7). Over this period in both countries, the improved quality of business equipment increased the effective supply of capital goods relative to other goods (such as consumer goods), lowered the relative price of capital goods, and raised their investment returns. Greater business investment has increased the quantity and quality of the capital stock, raising both labor and multifactor productivity. Trend

and cyclical changes in the relative prices of capital goods underlie the capital-embodied technical change theory of long-term economic growth and business cycles as advanced by Fisher (1999) and Greenwood, Hercowitz, and Krussell (1997).

Expected continued lower relative prices of business equipment should offset some of the impact of expected moderately higher capital financing costs in 2006 and 2007 in both countries. Real business equipment investment in Canada and the United States is expected to grow over the intermediate term. Information technology (IT) investment's share of GDP surged in both Canada and the United States in the late 1990's and 2000 until the sharp drop in information processing company stock prices in 2001 (app. fig. 7). IT investment rebounded in both countries in 2004 and 2005. Information-based industries had a 4.4-percent share of Canadian real GDP, compared with a 5.3-percent share in the United States in 2005.

Harchaoui, Tarkhani, Jackson, and Armstrong estimated that over the 1995-2000 period, IT investment contributed directly 0.4 percent to Canadian labor productivity growth through capital deepening in addition to its impact on multifactor productivity (2002, p. 9).³ Most economists believe that, in addition to contributing to higher productivity growth directly through more powerful and less expensive IT output, IT investment has impacted other sectors of the economy through improving the production, inventory management, and retailing of goods and services. For example, the use of IT equipment in retailing has allowed firms to establish more direct supply lines with manufacturers, manage inventory better, and produce product lines that better meet the demands of customers.⁴

Strong IT investment is likely to persist as IT costs continue downward and as more Canadian firms seek greater use for IT products. Canadian business investment in non-IT business equipment and structures should get a boost from the high-level utilization of productive resources in labor and capital

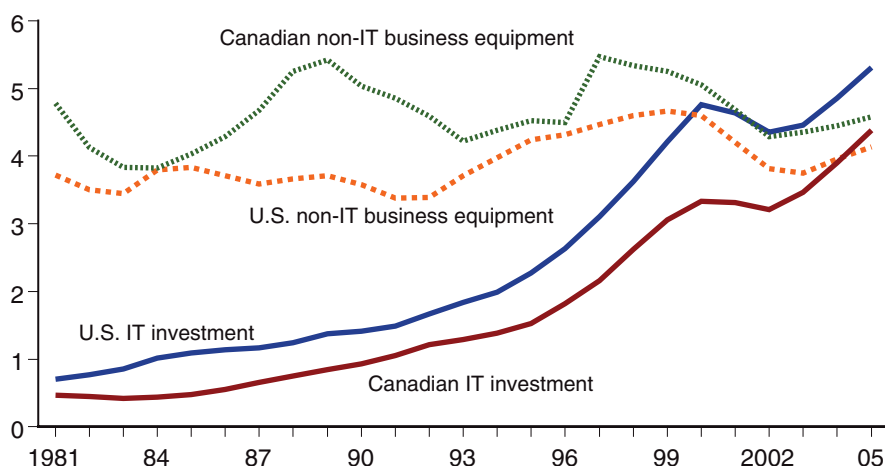
³For a discussion of industry share and productivity growth for Canadian IT and non-IT industries the reader should examine Harchaoui, Tarkakhani, Jackson, and Armstrong (2002) and Faruqui, Gu, Kaci, Laroche, and Maynard (2003).

⁴Information technology's role in the production, inventory, and sales process is discussed in Stiroh (2002), Oliner and Sichel (2000), and Baily 2004.

Appendix figure 7

Relative importance of Canadian IT investment has increased sharply

Share of GDP (percent)



Source: Statistics Canada and BEA. Statistics Canada may be found at CANSIM in Table 380-0026 Investment in Nonresidential Structures and Equipment and BEA data may be found at <http://www.bea.gov/bea/dn1.htm>.

markets and strong growth in corporate profits in 2004 and 2005. Although financing costs in Canadian long-term debt and equity markets are expected to rise roughly 0.5 percent in 2006, the overall outlook for Canadian investment and productivity growth remains highly favorable.

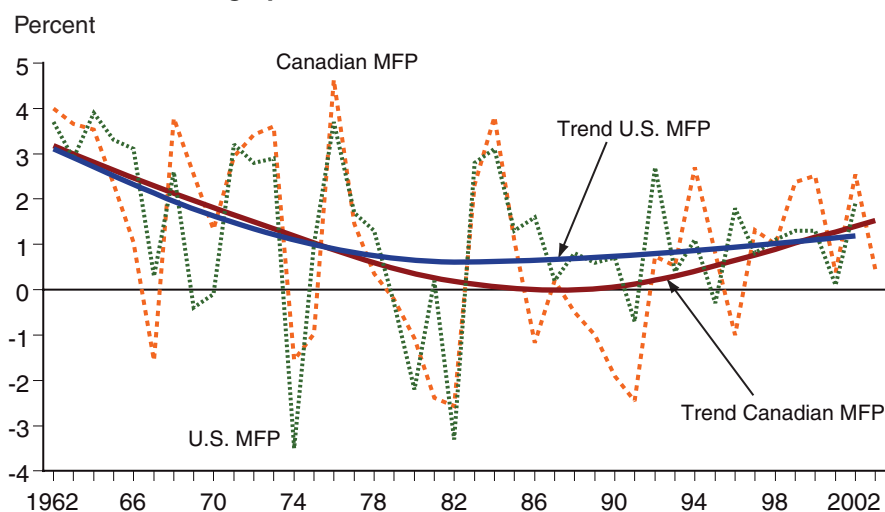
Multifactor Productivity

Canadian business multifactor productivity, as measured by Statistics Canada, has trended upward, increasing from 0.8 percent in 1995 to 1.5 percent in 2003 while, in comparison, trend U.S. multifactor productivity growth has been stable in the 0.7- to 0.8-percent range (app. fig. 8). The finding of higher multifactor productivity for Canada is troubling given the much higher rates of U.S. labor productivity and business investment in the United States. The estimated higher Canadian multifactor productivity is likely due to the underestimation of quality-adjusted labor and capital in Canada.⁵

However, the outlook for growth in Canadian multifactor productivity is still favorable given the positive outlook for strong growth in Canadian fixed business investment in general and information processing investment in particular, as well as economic growth in general. A dynamic growing economy with strong growth in business investment fosters specialization in labor and capital markets that generates prolonged growth in labor and multifactor productivity. The major ongoing restructuring in the automobile industry involving plant consolidations and renovations should raise productivity in the Canadian automobile industry while high oil prices encourage new investment in the Canadian energy industry.

Appendix figure 8

Canadian business multifactor productivity has been trending upward



Source: Statistics Canada and BLS. Canadian multifactor productivity data may be found at in Cansim Table 383-0013 while BLS productivity data may be found at <http://data.bls.gov/cgi-bin/surveymost?mp>.

⁵Canada and the United States differ significantly in how labor and capital services are measured in calculating multifactor productivity. For example, the Bureau of Economic Analysis explicitly accounts for worker quality in terms of worker experience, education, and sex, while Statistics Canada does not. Compared with the U.S. approach, Coulombe (2002) finds the Statistics Canada approach led to an overestimate of the growth of quality-adjusted hours worked in Canada in the 1960s and the early 1970s but generated an underestimate of quality-adjusted hours worked in the mid-1970s through late 1990s. Land and inventories are not counted in the Canadian capital stock but are included in computing the U.S. capital stock. According to Coulombe, the largest source of difference in the multifactor productivity numbers is Statistics Canada's use of higher rates of overall asset depreciation, especially in the early years of assets. The higher rate of asset depreciation generates a smaller estimate of the capital stock, particularly in times of recent strong growth in business investment. To remove these data inconsistencies, Coulombe recommends that Statistics Canada adapt the U.S. methodology in computing multifactor productivity.