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Canada's Changing Role in Global Supply Chains

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Canada's Changing Role in Global Supply Chains
by *Danielle Goldfarb* and *Kip Beckman*

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Preface

Canadian businesses and governments face a world in which companies can buy or make inputs—either goods or services—anywhere in the world. Despite this significant and dynamic restructuring of global production, we know little about Canada's role in it. The Conference Board of Canada's newly formed International Trade and Investment Centre aims to plug this gap. This study—the Centre's first—takes a step toward describing Canada's role in global production. It examines at what stages other countries use Canadian goods, and at what stages Canadian companies use their goods. And it draws out the implications for government and business.

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Report on Canada's Changing Role in Global Supply Chains

At a Glance

- Canada's parts trade with most of its major trading partners has grown, thus boosting the country's productivity and living standards.
- Most of the recent growth in such trade came from outside the U.S.
- Despite the growth in parts trade, most imports are still in final goods, so Canadian companies' involvement in global supply chains remains limited.
- To enable businesses to succeed globally, policy-makers should remove barriers to trade and investment with all major partners.

Companies increasingly produce products and services from global or regional components or services rather than producing entire products within one country. This matters because the evidence shows that specializing and trading globally ultimately leads to higher overall living standards. Yet available trade studies and data are limited in their ability to paint a picture of Canada's role in global or regional supply chains. In this study, The Conference Board of Canada takes a first step toward describing where Canada fits into global production. It examines at what stage major economies used Canadian goods in their supply chains over the past 15 years, and at what stage Canada used their goods in its supply chains.

The study found that, contrary to common wisdom, the share of Canada's goods exports that enter other countries' supply chains at an early production stage—exports such as raw materials—has fallen when price fluctuations are excluded. Canada has moved toward trading inputs that enter Canada and other's supply chains at a more advanced stage. This suggests that businesses took advantage of efficiency gains that came from dividing production into smaller pieces and then buying or making each input where it could be produced most efficiently.

Canada's parts trade with the United States grew tremendously over the 1990s, but that growth has since come to a standstill. This could mean that few gains from such trade remain to be exploited, or that non-tariff trade barriers—such as regulatory differences—prevent companies from achieving those gains. By contrast, parts trade with other major economies—particularly developing countries—continued to grow in recent years. The use of Chinese components in Canadian supply chains, for example, grew significantly. Continued recent growth in this trade suggests that companies may still be able to benefit from important efficiency gains from parts trade with these other major economies.

Specializing and trading globally ultimately leads to higher overall living standards.

Despite growth in imported inputs, and the increasingly important role of Canada's imported inputs from major developing countries, most imports are still of finished goods. This suggests that, aside from the U.S. market, Canadian companies' involvement in global supply chains remains limited. It also suggests that, despite the expected benefits to Canadian prosperity from global engagement, Canadian companies may not be fully seizing the available global opportunities. To enable them to do so, policy-makers must eliminate remaining trade and investment barriers (while balancing these goals against other public interest goals.) This should include barriers that penalize imported inputs (and, in turn, hurt Canadian prosperity). Policies should address barriers that could impede further gains in Canada–U.S. trade and barriers that affect other major markets. Canada's global success also depends critically on effective domestic policies, such as eliminating inter-provincial trade barriers and improving infrastructure.

Together, these actions will allow businesses to make efficient decisions—to specialize in what they make most efficiently and to buy globally that which others make more efficiently. Businesses will need to respond by taking a hard look at their activities to

assess which ones should be carried out in Canada, which in the U.S., and which in other, faster-growing markets, in order to retain and enhance their global competitiveness.

Introduction

Chapter Summary

- Companies increasingly make or buy inputs from wherever in the world they can be produced most efficiently.
- Specializing and sourcing parts from where they can be made most efficiently results in greater prosperity.
- Canada's role in global supply chains therefore matters for this country's living standards.
- Current data do not adequately describe Canada's role in these complex global linkages.
- This report examines at what stage Canadian goods are used by other countries, and at what stage Canada uses goods from other countries.

Rather than producing something entirely within one country, companies increasingly use inputs from two or more countries to produce a single good or provide a service. Declines in tariffs, transportation costs and communication costs, combined with technological advances, have made it both possible and attractive to break production into smaller parts. Companies then produce or buy each input—for example, goods such as electronic parts or services such as engineering—from wherever in the world it can be made or provided most efficiently. In recent years, exports and their imported inputs have risen together, increasing the share of components in total trade. There has also been a significant increase in global foreign direct investment and sales of foreign affiliates. Combined, these developments provide strong evidence of a trend toward increasingly global or regional—rather than strictly national—supply chains.

Where does Canada fit into this picture? To what degree are Canadian companies involved in global or regional supply chains? Are companies in Canada taking advantage of components produced globally—in the United States and in rapidly growing economies such as China, India, Brazil, and Russia—to reinforce their competitive position? Do others draw on Canadian

components or raw materials to make their products? Where might future opportunities lie? And how should Canadian governments and businesses best leverage Canadian competencies?

The answers to these questions matter. Canada's role in global and regional supply chains affects the country's prosperity. According to available evidence, slicing production into smaller pieces and producing each part where it is most efficient to do so tends to improve productivity. This does not mean working harder but working smarter. Productivity, in turn, drives living standards higher.

Companies increasingly use inputs from two or more countries to produce a single good or service.

For example, by buying information technology components globally from where they were most efficiently produced, U.S. companies lowered their prices by 30 per cent, raised the country's productivity, and boosted gross domestic product by US\$230 billion from 1995 to 2002.¹ In Canada, Canadian plants became more specialized after the Canada–U.S. Free Trade agreement eliminated tariffs.² Companies then traded across the border for parts that could be made more efficiently on the U.S. side. The long-term result was a significant increase in manufacturing productivity.³ Also, specialization in production and trade has resulted in higher Canadian incomes and employment.⁴

1 Catherine L. Mann, *Globalization of IT Services and White Collar Jobs: The Next Wave of Productivity Growth* (Washington: Institute for International Economics, December 2003).

2 John Baldwin and Wulong Gu, *Responses to Trade Liberalization: Changes in Product Diversification in Foreign- and Domestic-controlled Plants*, Micro-economic Analysis Division (Ottawa: Statistics Canada, 2005).

3 Daniel Treffer, "The Long and Short of the Canada–U.S. Free Trade Agreement," *American Economic Review* 94, 4 (2004), pp. 870–895.

4 Eugene Beaulieu and Herb Emery, "Stay the course or find a new path? Canada's reliance on the U.S. as an export market." In Curtis, John M., and Aaron Sydor (Eds.), *NAFTA@10* (Ottawa: Minister of Public Works and Government Services, 2006).

Studies also find that globally engaged companies tend to grow faster than comparable locally focused companies.⁵ Sourcing globally might also allow Canadian companies to regain some of the competitiveness they lost with the Canadian dollar's appreciation in recent years. In addition, it could help offset some of the expected slowdown in economic growth potential associated with Canada's aging population.

Globally engaged companies tend to grow faster than comparable locally focused companies.

Despite the reality that trade is increasingly in the form of inputs, most available studies treat trade as if it were all in completed products. Moreover, available trade statistics fail to convey an adequate picture of the linkages that form global supply chains in the real

world. To get a complete picture of Canada's role in these complex global linkages, one would need to track the economic links between Canada and all countries for all components and service inputs from conception through production and delivery.

This report helps paint a picture of this global reality and Canada's role in it. Data on supply chain activity traced throughout the globe are unavailable, and data on services trade are limited. The report, therefore, focuses on trade in goods between Canada and selected major economies (recognizing that this is only one part of the picture). The study's unique contribution is to examine at what stage Canadian goods are used in other major economies' supply chains, at what stage Canada uses other major economies' goods in its production, and whether this has changed over time. It then draws out key implications for business and government decision-makers.

⁵ Evidence for a range of countries is provided in Lewis III, Howard, and J. David Richardson, *Why Global Commitment Really Matters!* (Washington: Institute for International Economics, 2001).

Examining Trade From the Buyer's Perspective

Chapter Summary

- Trade is classified by the stage at which its international buyer uses the good or service: at entry to the supply chain, at a more advanced or middle point, or as a final or end-point good.
- Middle-point trade suggests countries are breaking down production into smaller parts, with each country or region specializing in those parts of the process that it can carry out most efficiently.
- End-point trade means goods are consumed as final products and could suggest there is little supply chain integration between trading partners.
- To get a truer picture of changes to Canada's trade volumes, we remove price movements from export and import data.

This study examines internationally traded goods according to the stage at which the buyers or importers of those goods would normally use them in their supply chains or as final products. This is different from much previous trade analysis that either categorizes all trade as final goods or examines the stage of production from the exporter's or seller's perspective.

The report looks at Canada's trade with several mature developed-country markets, as well as with a number of rapidly growing developing markets.

Goods were classified according to three stages—entry, middle, and end or final goods. (See boxes “Stages of Entry Into Global Supply Chains” and “Why Stage of Use in Supply Chains Does Not Necessarily Determine Value Added” for explanations of the stages.)

Using the three stages, the study examines Canada's goods trade. (Understanding how services fit into global supply chains is critical to painting a complete picture of Canada's role in global supply chains. However, their inclusion is left for future research, as services data are limited, less reliable than goods data, and only available with a several-year lag. Also, it is not possible to tell from trade data whether services are inputs into other products or final products themselves.)

The report looks at Canada's trade with several mature developed-country markets, as well as with a number of rapidly growing developing markets. (Supply chains extend beyond trade between two countries or regions, but available data are not yet able to trace the path of trade throughout global supply chains.)

The examination covers 1990, 2000, and 2005, in order to capture the post-Canada–U.S. Free Trade Agreement period, and also more-recent developments such as the post-9/11 period and the rapid growth of some large developing markets. Due to the labour-intensity of this process, the points of analysis are limited to these three years.

To capture most of Canada's goods trade, the study examined Canada's top 25 exports and imports¹ to and from major economies. In 2005, these accounted for just under 80 per cent of Canada's total goods trade with the world but over 90 per cent of Canada's trade with large, rapidly growing developing markets. Because the figures were for the top 25 goods traded in each period, the list varied during the different periods, although the variations were small. However, the variations do serve

¹ While we categorize goods by stage of entry into supply chains at the Harmonized System's four-digit level in order to be as precise as possible, we select the top 25 export and import categories at the two-digit level (i.e., broader, more aggregated commodity categories) in order to capture more of total trade.

Stages of Entry Into Global Supply Chains

We sort trade into three stages from the buyer's point of view. The stages are:¹

- 1) Entry into the supply chain at the beginning or *entry point* of the manufacturing process.
- 2) Entry at a more advanced or *middle point* of the process.
- 3) Final or *end-point* goods that do not enter into the buyer's production process at all.

We consider all raw materials trade as entry point. This stage, however, is not confined to raw materials. Goods that have been initially processed are intermediate goods in the eyes of an exporter but might enter an importer's supply chains at an early or entry-point stage. For example, making a steel plate requires converting iron ore into steel and then into steel plate, so the producer would consider the steel plate as an intermediate product. But the buyer might use the steel plate at the earliest stage of building a car—which would make it an entry-point good in his or her supply chain. Similarly, an exporter would classify a two-by-four wood stud constructed from raw lumber as an intermediate good. An importer would use the two-by-four in an early stage of production, making it an entry-point input in this study.

We classify a car bumper as a middle-point good since it is a component used in the advanced stages of building a car. We consider the car itself an end-point good from the importer's perspective, recognizing that someone will still need to market, distribute, and perhaps provide after-sales service for the good before it truly is at the end point of the entire supply chain. All references to components, parts or inputs in this report refer to middle-point trade and some entry-point trade—and exclude end-point trade.

What do these classifications tell us about Canada's role in global supply chains? A large share of entry-point trade suggests a high level of integration in other's supply chains at the raw materials or basic input stage. If the data show a large share of middle-point trade, Canada may be highly integrated in other countries' supply chains, and other countries may be tightly integrated into Canada's supply chains, at a more advanced input stage. This is consistent with companies dividing production into smaller parts. Canada then specializes in those parts of the process that it can carry out most efficiently, and trades internationally for the rest, boosting productivity and therefore living standards. An increase in middle-point imports in particular may suggest that Canadian companies are substituting away from such activities at home. A key difference between middle-point inputs and most entry-point inputs is that raw materials extraction is bound by geography, whereas producers can theoretically buy other entry-stage inputs and middle-point inputs anywhere.

If neighbouring countries rely heavily on middle-point trade in both directions, this suggests that much trade takes place within the same industry. Over 70 per cent of Canada–U.S. merchandise trade, for instance, involves exports and imports within the same industries.² An increase in middle-point trade could also reflect increased trade within multinational companies, either through foreign direct investment or by buying inputs from the cheapest global supplier. The recent observed increase in intermediate inputs imported by developed countries can be explained by three different factors: production inputs bought from outside the company from the cheapest global supplier, increased trade within multinational corporations across national borders, and production relocated to countries with a comparative advantage in a particular product.³

Finally, end-point trade means that goods are traded as final products and consumed without being part of the receiving country's supply chain (unless the receiving country supplied inputs that were used to make the final product). In other words, a high degree of end-point trade could suggest that the supply chains of the two countries are not very integrated.

The relationship between imports and exports at various entry stages may give us further clues about the degree of Canada's global integration. For example, if Canada's end-point export shares have gone up, we might conclude that other countries are less involved in Canada's supply chains. If, however, imported inputs and end-point exports move in parallel, this could be consistent with (though not proof of) more integrated supply chains.

1 Our classifications of exports and imports into entry, middle and end are available upon request. We classified goods at the four-digit level of the Harmonized System of commodities, which is a relatively fine-grained level of analysis. While most classifications were straightforward, some required judgment on our part. We chose this more labour-intensive approach instead of using Statistics Canada's input-output tables for two reasons: First, input-output tables would show trade data by stage of production from the exporter's perspective—and in this study we are interested in how the good is used in the importer's supply chain. Second, input-output data are released only after a several-year lag, whereas trade data are available for the previous year and we are interested in capturing any recent shifts associated particularly with rapidly growing emerging markets. Since the Canadian currency began to appreciate in 2003, if we relied only on input-output data we would miss any shifts in the trade structure associated with the currency appreciation.

2 Foreign Affairs and International Trade Canada, *Seventh Annual Report on Canada's State of Trade: Trade Update—2006* (Ottawa: June 2006), p. 45.

3 Jorn Kleinert, "Growing Trade in Intermediate Goods: Outsourcing, Global Sourcing, or Increasing Importance of MNE Networks," *Review of International Economics* 11, 3 (August 2003), pp. 464–482.

as an alert to major changes in the structure of Canada's involvement in global supply chains (which is, after all, the aim of the study).

We convert trade data into real terms to remove price fluctuations and produce a truer picture of the changes in volumes of raw materials and other goods.

Since our goal is to observe changes in the mix of Canada's trade by stage of entry into the supply chain, we convert trade data into real terms, which takes out the effects of inflation.² The advantage of this approach is that it removes large and frequent price movements of raw materials in particular, thus providing us with a truer picture of the changes in volumes and shares of such goods. Decision-makers should also care about changes to Canada's prosperity arising from changes in the price of what Canada exports relative to the price of what it imports (what economists call "the terms of trade"). This report therefore provides a few summary results in nominal terms, which leave in the effects of inflation.

The study uses bilateral trade data collected by customs officials and provided by Statistics Canada through Industry Canada's Trade Data Online. While official trade data are far from perfect, they provide the best available summary picture of Canada's international trade. (See box "Why Trade Statistics Overstate Canada-U.S. Trade and Understate Canada's Non-U.S. Trade.")

² To convert the data into real terms, we use export and import price deflators closely associated with each commodity at the Harmonized System four-digit level.

Why Stage of Use in Supply Chains Does Not Necessarily Determine Value Added

One might be tempted to conclude that an entry-point good adds little value to the supply chain, and that middle- and end-point goods add more. We should, however, be careful in doing so. Just because a good is classified as entry point does not always mean that it adds little value to the supply chain, nor does an end-point good necessarily represent a higher value-added part of the process. According to calculations from Statistics Canada data, some raw materials—such as oil and gas—represent higher value added than many middle- and end-point goods.¹ Other entry-point goods such as primary metal represent lower value added than more processed fabricated metal that enters supply chains at a more advanced stage. Further, production of an end-point good may represent only a very small amount of the total value added. Car assembly in Canada, for example, represented a value added of less than one-fifth in 2003, while car parts—which arrive at an earlier stage of entry into cross-border supply chains—represented close to one-third of value added. There is also some variation in value added within each of the entry, middle and end categories.

As well, commentators frequently argue that developed countries, such as Canada, should "move up the value chain" to generate increases in living standards. Their rationale is that, if relative prices do not change, it takes more lower value-added exports than higher value-added exports to generate the same increases in living standards. Higher value-added trade is not the only way to improve living standards through trade, however. Canada's wealth also rises when the price of what the country exports increases relative to the price of what it imports. So if Canada primarily exports commodities and imports manufactured goods, and the price of commodities rises relative to the price of manufactured goods, then the country is better off even if volumes do not change. Commodity exports could play an important role in generating increases in Canada's future living standards, especially given the increasing demand for commodities from rapidly growing China.

¹ To calculate value added, we divided gross domestic product by its value-added components from the Statistics Canada input-output tables for 2003.

Why Trade Statistics Overstate Canada–U.S. Trade and Understate Canada’s Non-U.S. Trade

Statistics Canada trade data, as collected by customs officials, likely overstate Canadian trade with the United States. One reason is that customs officials count the entire value of the good each time it crosses the border, rather than just the portion of value that has been added since the last border crossing. Much Canada–U.S. trade is highly integrated, with producers frequently trading parts across the border at different stages of production. Only a small amount of value may therefore be added at each stage, while the value of the entire product is counted in the statistics. The result likely overstates Canada–U.S. trade.

Another reason why official figures might overstate Canada–U.S. trade is that customs data on Canadian exports to the U.S. may inadvertently include goods shipped through the U.S. to final destinations outside the United States. Conversely, U.S. exports to Europe that travel through Halifax, for example, may also be mistakenly recorded as U.S. exports to Canada. So the bias runs in both directions.

One factor, however, likely makes Canada–U.S. trade data more accurate than Canada’s trade numbers with other countries. Statistics Canada uses U.S. customs data on U.S. imports from Canada as its source for data on Canadian exports to the United States. This is because import data are generally more reliable than export data. Customs officials are typically more vigilant in checking goods entering a country than those leaving.

Official measures of Canada’s non-U.S. trade likely understate trade and may be less accurate by comparison. Unlike exports to the U.S., such data are not taken from, or reconciled with, other countries’ import data. The recorded differences are major. Statistics Canada found¹ that Canadian exports to non-U.S. destinations in 2005 as measured by customs statistics were one-fifth lower than figures on exports to those destinations based on transportation data. About one-tenth of the difference was attributed to Japan, with the rest attributed to (on an equal basis) the European Union, other Organisation for Economic Co-operation and Development (OECD) countries, and all other countries. The “all other countries” category likely refers mostly to trade with China, while the “other OECD countries” category likely captures much of the trade with Mexico.

A Statistics Canada study² found that China’s published imports from Canada exceeded Canada’s published exports to China by \$1.4 billion in 2003. It also found that Canada’s published imports from China exceeded China’s published exports to Canada by a much larger \$10.7 billion. To put the magnitude of these differences in perspective, the first difference represents one-third of the value of Canada’s exports to China, and the second difference is almost \$3 billion larger than the entire value of published Chinese exports to Canada. According to the study, most of the difference between Canada’s published imports from China and China’s published exports to Canada is due to goods that arrive in Canada via the U.S. and that China misallocates as exports to the U.S. but Canada records as imports from China. Most of the difference between China’s published imports from Canada and Canada’s published exports to China is due to goods that arrive in China via Hong Kong. Canada may misallocate these as exports to Hong Kong while China may record them as imports from Canada.

The situation is similar for Mexico. According to a Statistics Canada study,³ Canada recorded 2001 exports to Mexico at \$4.2 billion lower than the Mexican authorities recorded imports from Canada. Similarly, Canada’s recorded imports from Mexico were \$7.4 billion higher than Mexico’s published exports to Canada in that year. The main reason for the difference is that goods in both directions pass through the U.S. on their way between Canada and Mexico but are either not recorded at all or misallocated to the United States.

Overall, Canadian trade data appear to overstate Canada–U.S. trade and under-report Canada’s trade with countries other than the United States. Policy-makers and business leaders must keep this in mind as they interpret trade statistics.

1 Author correspondence with Statistics Canada Balance of Payments Division.

2 Sandra Bohatyretz and Bruna Santarossa. *Merchandise Trade Reconciliation Study: Canada-China, 2002 and 2003*, Analytical Paper: Canadian Trade Review. Catalogue no. 65-507-MIE—No. 003 (Ottawa: Statistics Canada, August 2005).

3 Statistics Canada, *Canada-Mexico Merchandise Trade Reconciliation: 2000 to 2001* (Ottawa: Statistics Canada, 2003).

Canada's Global Trade From the Buyer's Perspective

Chapter Summary

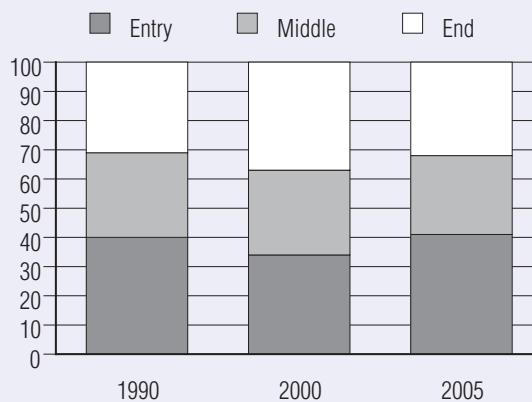
- With price effects removed, Canada's share of raw materials and other inputs that enter foreign supply chains at early stages fell from 40 to 30 per cent between 1990 and 2005.
- Over the 1990s, Canada's share of both middle-point exports and imports rose significantly, suggesting increased integration in supply chains outside Canada.
- This is consistent with evidence of Canadian plants specializing in those inputs they produce relatively more efficiently, and trading for other inputs.
- Over 2000–05, neither Canada's share nor volume of middle-point trade grew, suggesting this country's integration in supply chains hit a plateau.

Looking at Canada's trade with all countries by entry-stage into the importer's supply chain, the first thing to notice is that Canada's trade grew in all three categories over the 1990s, regardless of whether price effects (the effect of price fluctuations) are included or excluded. This is not surprising, since Canada–U.S. trade dominates Canada's overall trade, and the 1990s was a period of strong U.S. economic growth that followed the signing of the Canada–U.S. Free Trade Agreement.

A few other points stand out. Without controlling for price effects, Canada trades a larger share of its total trade at the entry-point stage today than it did 15 years ago. (See charts 1 and 2.) But when we control for price fluctuations, Canada's share of entry-point trade actually falls significantly over the period. (See charts 3 and 4.) Since overall trade grew significantly over the period, this means that entry-point trade grew much more slowly than the other categories. Of course, regardless of the measure, entry-point exports—mostly

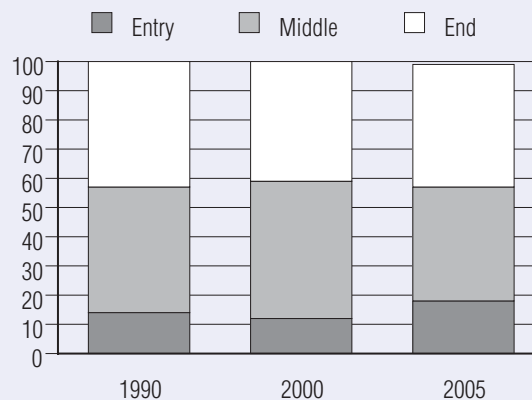
oil and minerals—were, and are, much more important than entry-point imports. This makes sense, given Canada's abundance of a wide variety of natural resources.

Chart 1
Canada's Top 25 Global Exports by Buyer's Stage of Use (including price effects; per cent share)



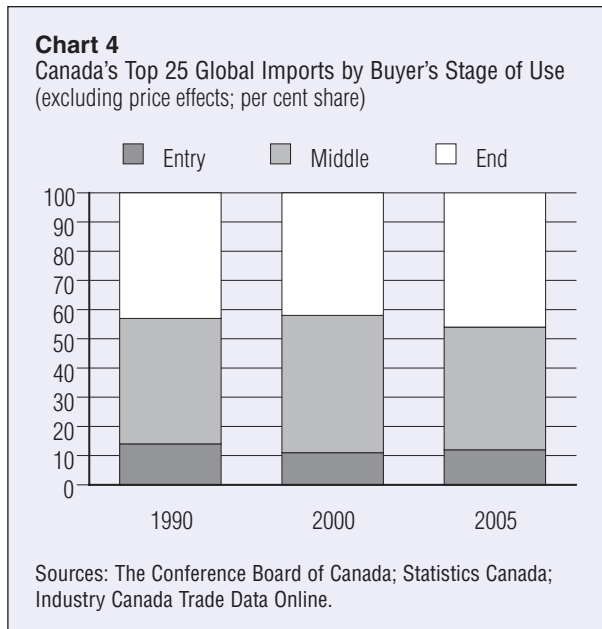
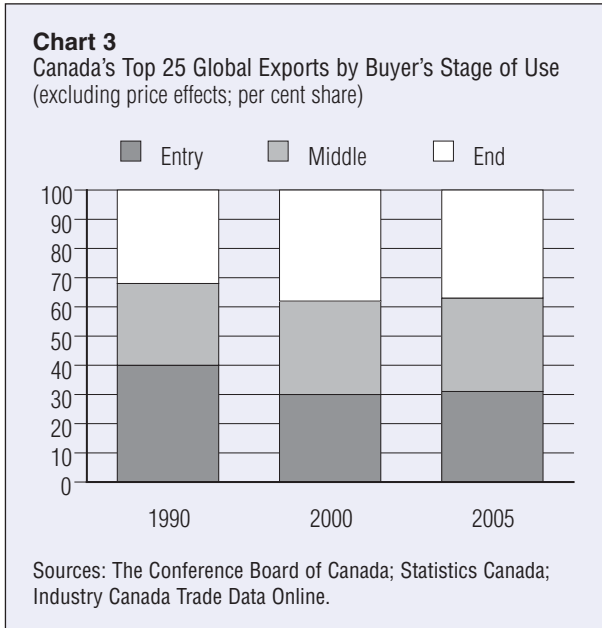
Sources: The Conference Board of Canada; Statistics Canada; Industry Canada Trade Data Online.

Chart 2
Canada's Top 25 Global Imports by Buyer's Stage of Use (including price effects; per cent share)



Sources: The Conference Board of Canada; Statistics Canada; Industry Canada Trade Data Online.

Also, with price effects left in, Canada's share of middle-point exports remained the same over the 1990s and fell over the 2000–05 period with no volume increase. The share of middle-point imports rose during the 1990s. But by 2005 it had fallen back to a share lower than its 1990 share, with a volume decline as well.



After we take out price effects, however, Canada's share of middle-point exports rose significantly over the 1990s. We observe an increase in the share of middle-point imports over the 1990s both with and without price effects. Over 2000–05, the share of middle-point exports (excluding price effects) stayed the same, with volumes falling slightly. The share of middle-point imports (excluding price effects) fell, though volumes stayed the same.

The rise in middle-point trade over the 1990s is consistent with the evidence that Canadian plants became increasingly specialized in that decade.¹ Companies appear to have restructured to focus on those inputs they produce relatively more efficiently. They then trade for those parts that others can make relatively more efficiently. The rise in middle-point exports and imports is also consistent with a significant decrease in the domestic content of Canadian exports over the 1990s, followed by what appears to be a plateau. The domestic content of Canadian exports dropped from over 70 per cent in the late 1980s to 64 per cent by the mid-1990s, before rising slightly to 65 per cent in 2002.²

The rise in middle-point trade over the 1990s is consistent with the evidence that Canadian plants became increasingly specialized in that decade.

With price effects included, end-point goods represented the same proportion of trade in 1990 as they did in 2005. By contrast, with price effects removed, end-point imports rose over the period. (See Table 1.) By 2005, end-point trade represented the most important share of total exports and imports. Most end-point goods traded were cars and machinery.

1 John R. Baldwin, et al., *Changes in the Diversification of Canadian Manufacturing Firms (1973–1997): A Move to Specialization*, Statistics Canada, Analytical Studies—Micro-Economic Analysis Division Series 11F0019MIE. No. 179 (Ottawa: December 2001).

2 Glen Hodgson and Anne Park Shannon, *Mission Possible: Stellar Canadian Performance in the Global Economy*, The Canada Project, Final Report, Volume I (Ottawa: The Conference Board of Canada, 2007), p. 16.

We also find that from 1990 to 2000 and through to 2005, Canada's total imported inputs move in almost perfect parallel with Canada's total exports of middle- and end-point goods, and vice versa.³ This suggests (though does not prove) that Canada supplies inputs for other countries' exports, and other countries supply inputs for Canada's exports.

3 As a measure of the interconnectedness between suppliers in Canada and global supply chains, we calculate the correlation coefficient between the time path (using 1990, 2000, and 2005 as the three points) of the total of entry- and mid-point imports and that of the total of mid- and end-point exports.

In sum, regardless of the measure, there were significant shifts in Canada's overall trade structure over the 1990s. The overall data suggest little change in Canada's involvement in global or regional supply chains over the 2000–05 period. The data do suggest that, overall, there is a moderate to high level of Canadian involvement in supply chains outside Canada and involvement by other countries in Canada's supply chains.

Canada's Trade With Major Developed Economies From the Buyer's Perspective

Chapter Summary

- Canada's trade in middle-point parts with most of its major developed-economy trade partners grew over 1990–2005, suggesting increased integration in their supply chains.
- Trade with the U.S. accounts for both the dramatic increase in Canada's overall parts trade over the 1990s and the plateau in this integrated trade over 2000–05.
- Though Canada–Western Europe trade volumes are low, the partners increased their trade in middle-point parts over both periods.
- Canadian suppliers appear to play little or no role in Japanese supply chains.

Breaking trade down by country or region can show whether the overall results mask important national or regional differences. Again, in order to show shifts in the trade structure, price effects are removed from the equation.

UNITED STATES

The U.S. represents by far the largest share of Canadian trade, at 82 per cent of exports and 58 per cent of imports in real terms (with inflation removed). Therefore, Canada's global trade trends reviewed in the previous chapter probably reflect mostly trends in Canada–U.S. trade. Two-way trade with the U.S. grew significantly between 1990 and 2000. In contrast, exports and imports declined slightly from 2000 to 2005. While entry-point trade volumes grew, they did so more slowly

than trade in middle- or end-point goods. (See Table 1.) This is because inflation—notably higher oil and gas prices—is removed from the calculation.

Though the share of middle-point exports to the U.S. fell slightly over the 1990s, middle-point trade between Canada and the U.S. increased dramatically. This reflects the reality of tighter economic integration between Canada and the U.S. over the period. Parts increasingly went back and forth across the Canada–U.S. border at various stages of production, with each side specializing in what they could make most efficiently. The strength of the U.S. economy and the Canada–U.S. Free Trade Agreement boosted this activity. Engine parts, rubber and plastics, and articles of iron and steel were some of the middle-point exports that grew by more than the average over the 1990s. Similar items accounted for the growth in imports.

Over the 1990s, middle-point trade between Canada and the U.S. increased dramatically, reflecting tighter economic integration between the two countries.

The observation that Canada's top exports to the U.S. are in the same categories as imports from the U.S. is consistent with the observation that 70 per cent of Canada–U.S. trade is in components within the same industry. The growth in middle-point exports to the U.S. coincided with spectacular growth in end-point imports from the U.S. over the 1990s. The growth in Canada's middle-point imports also coincided with a significant increase in end-point exports over the same period.

Table 1

Canadian Trade With the World and Selected Developed Economies, From the Importer's Perspective
(shares and volumes excluding price effects for 1990, 2000 and 2005; top 25 traded goods)

Importer's stage of use	Volumes (billions of 1997 dollars)						Shares of total (per cent)					
	Canadian exports to			Canadian imports from			Canadian exports to			Canadian imports from		
	1990	2000	2005	1990	2000	2005	1990	2000	2005	1990	2000	2005
World												
Entry	61	95	93	18	30	35	40	30	31	14	11	11
Middle	44	103	96	55	134	133	28	32	32	43	47	42
End	49	119	115	55	118	146	32	38	38	43	42	46
U.S.												
Entry	35	71	70	10	14	15	30	26	28	11	7	8
Middle	38	87	82	44	99	91	33	32	32	49	52	50
End	43	116	102	35	76	77	37	42	40	39	40	42
Western Europe												
Entry	9	8	10	10	7	7	67	44	47	65	23	17
Middle	2	4	5	3	10	12	15	21	22	17	31	32
End	2	6	7	3	15	19	17	35	31	18	47	51
Japan												
Entry	8	7	6	0.1	0.3	0.1	87	78	67	1	2	1
Middle	0.9	1.4	1.9	3	7	6	9	15	22	31	44	40
End	0.3	0.7	0.9	7	9	9	3	7	11	67	55	59

Note: Country and regional categorizations are from Industry Canada Trade Data Online.

Sources: The Conference Board of Canada; Statistics Canada; Industry Canada Trade Data Online.

Taken together, this provides more evidence consistent with tightly integrated cross-border supply chains, in which each side gained from specializing in particular inputs and trading across the border for the others.

Things changed after 2000. Rather than continuing the trend of dramatic growth in middle-point goods over 2000–05, Canada–U.S. trade in middle-point goods fell during the post-2000 period. The Canadian dollar appreciation starting in 2003 would not account for the drop in such trade in both directions. The fall-off in middle-point trade suggests slightly less integrated Canada–U.S. supply chains, and could imply that such integration will remain flat or unravel if the present trend continues.

This plateau or fall-off could be interpreted in several possible ways. It could mean that there are few potential efficiency gains left from specializing on the Canadian side of the border and trading with the United States. Or it could mean that there are important gains still to be had from Canada–U.S. trade in inputs, but that non-tariff trade barriers—such as regulatory differences—stand in the way of businesses taking advantage of these opportunities.

WESTERN EUROPE

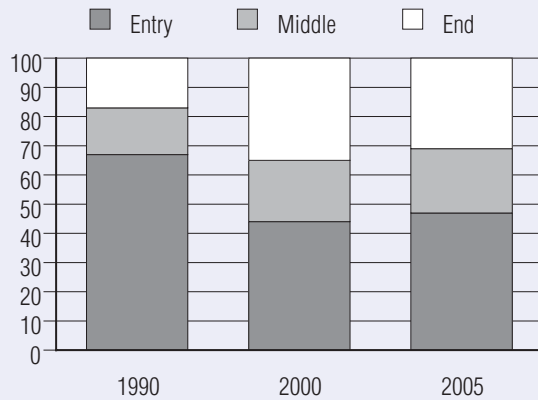
The U.S. results dominate the overall picture and mask some interesting trends elsewhere. Western Europe bought 7 per cent of Canada's exports in real terms, while 12 per cent of Canada's imports in 2005 came from Western Europe. Canada's entry-point exports dominate the mix at just under half of exports in 2005. (See Chart 5.) Still, Canada has shifted substantially away from buying goods at their entry-point from Western Europe. (See Chart 6.)

Canada–U.S. trade in middle-point goods fell after 2000, suggesting less integrated supply chains.

Two-way Canada–Western Europe trade in middle-point goods grew significantly over both periods. This is consistent with trading partners increasing their integration in each other's supply chains over the 15 years, albeit from a relatively low starting point.

Canada also saw large relative growth in its end-point imports from Western Europe. This could mean that Canada is completely uninvolved in Western

Chart 5
Canada's Top 25 Exports to Western Europe by Buyer's Stage of Use
(excluding price effects; per cent share)



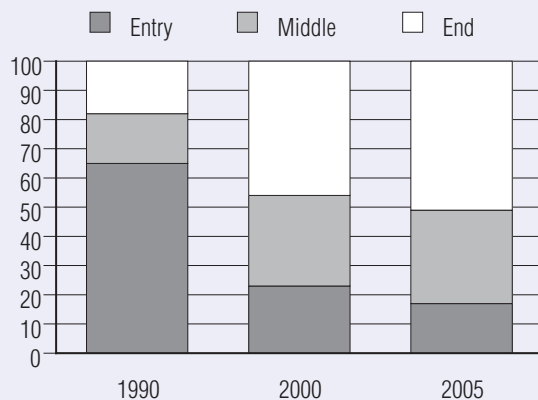
Sources: The Conference Board of Canada; Statistics Canada; Industry Canada Trade Data Online.

European supply chains for these products. But over the 1990–2005 period, Canadian imported inputs from Western Europe moved in sync with Canadian exports of middle- and end-point exports to the region. This suggests there may be a tighter supply chain link that merits further investigation.

Efficiency gains may still be possible from greater parts trade between Canada and Western Europe.

The balance of the evidence, then, is consistent with the two trading partners having become slightly more integrated into each other's supply chains but still at relatively low trade volumes. And the continued growth in middle-point trade suggests there may still be efficiency gains to be had from greater trade in parts between Canada and Western Europe.

Chart 6
Canada's Top 25 Imports From Western Europe by Buyer's Stage of Use
(excluding price effects; per cent share)



Sources: The Conference Board of Canada; Statistics Canada; Industry Canada Trade Data Online.

JAPAN

Japan accounted for only 3 per cent of Canada's exports and 4 per cent of imports in 2005 (with inflation removed). Canada's exports to Japan declined over the 15-year period, mostly because of Japan's stagnant growth since the early 1990s. Imports, on the other hand, grew between 1990 and 2000, before declining more recently. In 2005, Canada's exports to Japan were heavily tilted to those used at entry point, with few middle- or end-point goods. (See Table 1.) Imports from Japan were mainly end-point (59 per cent) and middle-point (40 per cent) goods. This marked a significant shift from 1990, with a decline in entry-point exports and increase in middle-point trade.

Taken together, these findings suggest that, except as providers of raw material inputs, Canadian suppliers play little or no role in Japanese supply chains or as providers of final goods to Japanese consumers. On the other hand, Canadian supply chains use slightly more Japanese parts now than in 1990.

Canada's Trade With Major Developing Economies From the Buyer's Perspective

Chapter Summary

- Over the 1990s, Canada reduced its share of raw materials and other entry-point trade with China.
- Canada–China middle-point trade volumes increased over the 1990s and between 2000 and 2005, with a particularly dramatic surge in Canada's imported inputs.
- Despite low trade volumes, a similar pattern of increased input trade in recent years emerges for Canada's trade with most other major developing countries.
- Canadians are increasingly taking advantage of production efficiencies by trading in more inputs.
- However, imports of final goods from countries such as China and Mexico dominate Canada's trade with developing countries, suggesting Canada is not participating in those supply chains.

more significant 10 per cent of this country's imports. Two-way trade has been growing rapidly, though more rapidly for Canadian imports from China than the other way around.

Though small, the volume of Canadian trade with some rapidly growing economies is rising quickly.

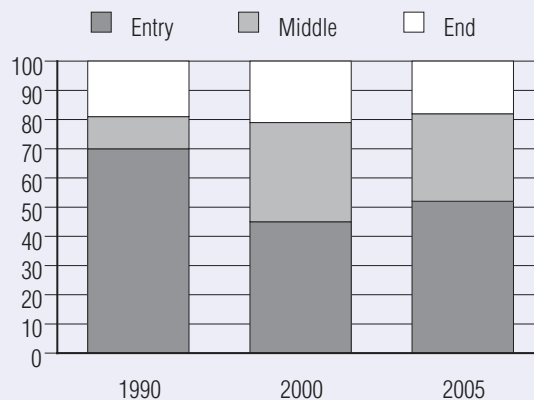
Even with price effects removed, Canadian exports to China mostly enter China's supply chains at the entry stage. (See Chart 7.) Over one-half of Canada's exports in 2005 were entry-point goods. These were mostly pulp and paper and cereals. Of the remaining exports, one-third entered China at the middle-point stage (mostly organic chemicals, machinery parts and auto components) and only one-fifth entered China as

Though trade volumes with developing countries still represent a small share of overall Canadian trade, trade with some rapidly growing economies is rising quickly, and published statistics understate trade with these countries.

CHINA

China is Canada's most important trading partner in the developing world and a country of great current public interest. Canadian exports to China account for only 2 per cent of Canada's exports in real terms (i.e., taking out the effect of prices). Still, Canadian statistics significantly understate Canada's published exports to China. In contrast to Canadian exports to China, Canadian imports from China account for a much

Chart 7
Canada's Top 25 Exports to China by Buyer's Stage of Use (excluding price effects; per cent share)



Sources: The Conference Board of Canada; Statistics Canada; Industry Canada Trade Data Online.

finished goods (mostly machinery and equipment). By contrast, Canada imports mostly end-point goods from China. (See Chart 8.) End-point imports from China accounted for over two-thirds of Canada's imports from China in 2005.¹

In addition to selling Canadians final products, China is supplying more inputs to Canadian supply chains.

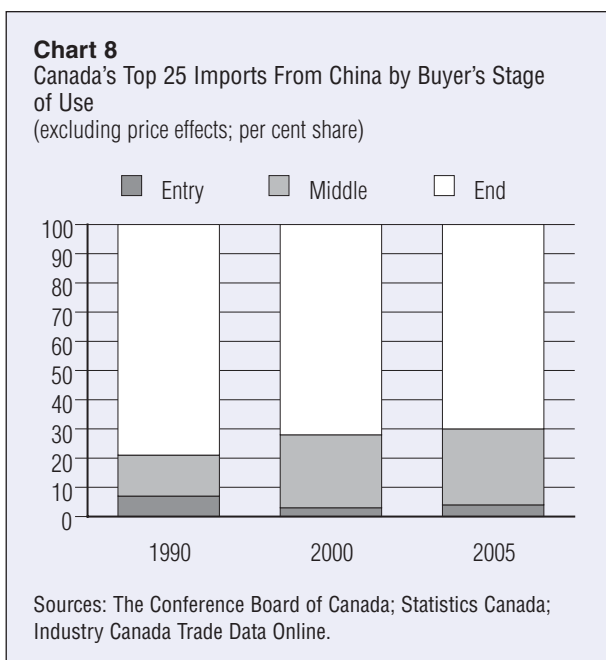
The public is well aware of Canada's natural resource sales to China and Canada's imports of Chinese finished goods such as electronics and games. Over the 1990s, however, Canada actually shifted away from entry-point trade in both directions in favour of dramatic increases in middle-point trade. This was partly due to a significant decline in cereal exports combined with important increases in auto parts, machinery parts, and electronic components.

Canada's share of middle-point exports fell slightly from 2000 to 2005, and auto parts exports to China fell. Overall, however, Canada and China continued to increase their sales of middle-point products into each other's supply chains at a rapid rate—at an average

annual compound growth of 9 per cent for exports and a massive 29 per cent for imports. (See Table 2.) This compares with negative rates for Canada-U.S. trade in middle-point products (and overall exports) over the same period, though overall Canada-U.S. trade volumes were much higher.

The spectacular increase in middle-point imports over the entire 15-year period was due to important increases across many different types of goods, but particularly electronic components and mechanical parts. Toys, clothing, and games were the top imports from China in 1990. By 2005, more sophisticated products and components—such as electrical and machinery equipment and parts—had displaced clothing and toys as the top categories. Imports of mechanical appliances had also assumed a much more important role. While Canada's auto parts imports from China were not on the list of Canada's top 25 imports from China in 1990, they were ranked as the 12th largest import in 2005, and the Chinese government is actively pushing for a strong auto parts sector in the future.

Overall, China has moved to supplying both more sophisticated inputs to Canadian supply chains and more final goods to consumers. Trade in middle-point products points to Canadian efficiency gains that come from specializing in smaller fragments of production while trading for those items that China can make more efficiently. China appears, however, to be supplying Canadian supply chains with far more of these inputs than it is taking from Canada. Further, the rapidly growing volume and dominant share of end-point imports from China may suggest that Canada is not very involved at all in Chinese or Asian goods supply chains (though it does benefit from the resulting cheaper goods). But an analysis that included services might uncover greater Canadian involvement in supplying inputs to Chinese supply chains.

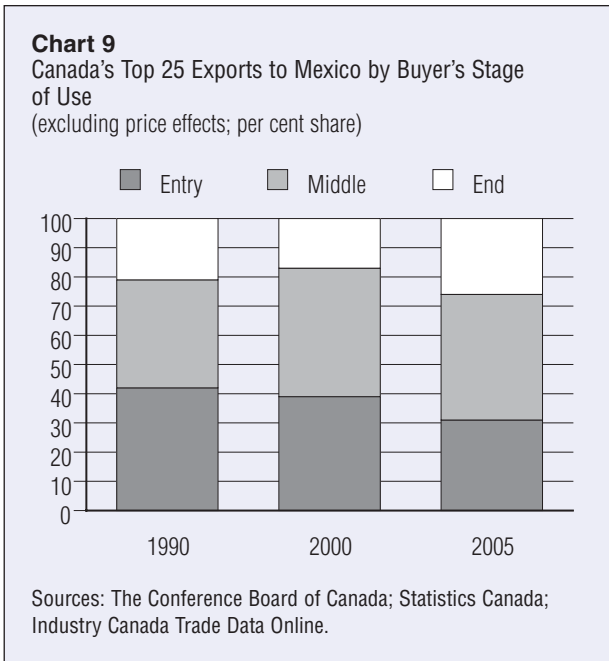


MEXICO

Mexico is Canada's most important trade partner in the developing world after China. Still, with inflation excluded, Mexico represents a mere 1 per cent of Canada's exports and 4 per cent of imports. Canada's trade with Mexico grew rapidly in the post-North American Free Trade Agreement (NAFTA) period. From 2000 to 2005, growth was less rapid but still relatively strong.

¹ Asia is highly economically integrated, so while official statistics record these imports as coming from China, most were likely created and processed elsewhere in Asia with final assembly in China. Trade with China therefore captures relationships between Canada and Asian suppliers to some extent.

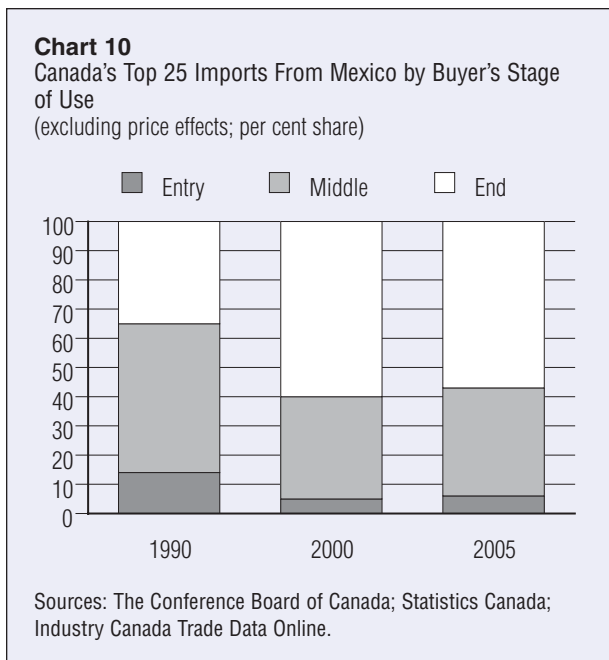
By 2005, entry-point exports to Mexico had become relatively less important (see Chart 9), though they still grew over the 15-year period. (See Table 2.) Canada primarily sold Mexico goods used at the middle-point of production (43 per cent) in 2005. At the same time, Canada bought mostly middle-point goods for use in its supply chains (37 per cent) and end-point goods (57 per cent) from Mexico. (See Chart 10.)



Canada's end-point imports from Mexico rose dramatically over the 1990s, mostly in electronic machinery and cars. This could suggest limited Canadian involvement in these Mexican supply chains. Canada's end-point exports to Mexico—also electronic machinery, cars, and a range of other goods—grew by a similar pace over the more recent period (though the volumes are much smaller than for Canada's end-point imports from Mexico).

As well, middle-point exports and imports both grew significantly post-NAFTA. After 13 per cent compound annual average growth between 1990 and 2000 and 9 per cent over the following five years, exports that enter Mexico's production at the middle point now play a more important relative role. (Recall that over the latter period, Canadian middle-point exports to the U.S. declined.) The growth over 2000–05 was due more to increased exports of paper and paper articles than to exports of more sophisticated electronic or machinery components (which grew only slightly).

Middle-point trade volumes with Mexico grew rapidly over the 1990s and continued to grow quickly in recent years.



Though the share of middle-point imports from Mexico actually fell, Canada's overall middle-point imports from Mexico still grew significantly. Middle-point imports were up by a compound annual average of 16 per cent between 1990 and 2000. This slowed to a still significant 8 per cent rate for 2000–05, which was higher than the 6 per cent rate for all Canadian imports from Mexico. High import growth rates over both periods were due in part to dramatic growth in imported electrical components. This occurred not just in the immediate post-NAFTA period but also in more recent years.

Mexican parts may be used to produce Canadian exports to Mexico and vice versa. From 1990 through 2005, Canadian exports to Mexico of materials and parts rose or fell almost perfectly in sync with Mexico's exports to Canada of parts and final goods (though the volumes of Canada's imports from Mexico were much higher). Although not conclusive, taken together with increases in middle-point trade volumes, this is consistent with

supply chains between the two countries being highly integrated. The continued growth in both middle-point exports and imports over both periods suggests that the two countries seem to be taking advantage of efficiencies in production location by trading in more inputs. It may suggest that there are still efficiency gains to be had from greater trade in inputs. However, Canada seems to be providing less sophisticated middle-point inputs into Mexico's supply chain in more recent years, while Mexico appears to be providing more sophisticated middle-point components into Canada's supply chain.

BRAZIL, INDIA, AND EASTERN EUROPE

Canada's trade with three other major economies—Brazil, India, and Eastern Europe—is relatively minor. Still, if trade continues to grow at current rates, volumes will increase to more meaningful levels. Like the previous countries, this group also traded more middle-point goods with Canada over the same time period.

(See Table 2.) Canada's middle-point exports to Brazil grew by a spectacular annual average compound growth rate of 18 per cent over the 1990s. This was double the growth rate of Canada's global exports. It represented a dramatic shift away from entry-stage exports toward goods that enter Brazil at a more advanced stage of the supply chain. In the post-2000 period, however, the volume of middle-point exports to Brazil fell.

Most major developing economies dramatically increased their middle-point trade with Canada over the last 15 years.

The pattern reversed for Canada's middle-point imports from Brazil. They grew relatively little over the 1990s but rose at a compound annual average of 17 per cent over the 2000–05 period (when Canada's middle-point imports from all countries hit a plateau).

Table 2

Canadian Trade With the World and Selected Developing Economies, From the Importer's Perspective
(shares and volumes excluding price effects for 1990, 2000 and 2005; top 25 traded goods)

Importer's stage of use	Volumes (billions of 1997 dollars)						Shares of total (per cent)						
	Canadian exports to			Canadian imports from			Canadian exports to			Canadian imports from			
	1990	2000	2005	1990	2000	2005	1990	2000	2005	1990	2000	2005	
World	Entry	61	95	93	18	30	35	40	30	31	14	11	11
	Middle	44	103	96	55	134	133	28	32	32	43	47	42
	End	49	119	115	55	118	146	32	38	38	43	42	46
China	Entry	1.6	1.5	3.1	0.1	0.3	1.3	70	45	52	7	3	4
	Middle	0.3	1.2	1.8	0.2	2.5	9	11	34	30	14	25	26
	End	0.5	0.7	1.1	1.2	7.3	24	19	21	18	79	72	70
Mexico	Entry	0.3	0.8	1.0	0.3	0.6	0.9	42	39	31	14	5	5
	Middle	0.3	0.9	1.3	0.9	4.0	5.8	37	44	43	51	35	37
	End	0.1	0.3	0.8	0.6	7.0	9.0	21	17	26	35	60	57
Brazil	Entry	0.3	0.2	0.2	0.2	0.5	0.9	51	24	24	25	36	33
	Middle	0.1	0.5	0.3	0.2	0.3	0.7	16	46	38	18	24	26
	End	0.2	0.3	0.3	0.5	0.6	1.2	33	30	38	57	40	42
India	Entry	0.1	0.2	0.4	0.0	0.3	0.3	40	48	44	16	27	16
	Middle	0.12	0.15	0.3	0.0	0.3	0.5	32	28	30	12	24	32
	End	0.11	0.13	0.3	0.2	0.5	0.8	29	24	26	72	49	52
Eastern Europe	Entry	0.1	0.1	0.2	0.1	0.8	1.3	47	8	16	21	47	44
	Middle	0.0	0.2	0.6	0.1	0.3	0.6	16	36	41	20	21	20
	End	0.1	0.3	0.7	0.2	0.5	1.1	37	55	43	59	32	36

Note: Country and regional categorizations are from Industry Canada Trade Data Online.

Sources: The Conference Board of Canada; Statistics Canada; Industry Canada Trade Data Online.

The surge in Canadian imports from Brazil over this period—at all stages of entry into Canada’s supply chain—makes sense in light of Brazil’s rapid economic growth. Canadian inputs and Brazil’s manufactured exports did not move in sync between 1990 and 2005, nor did Brazilian inputs and Canadian manufactured exports. So there does not appear to be a highly integrated supply chain relationship in either direction.

India and Eastern Europe, however, increased their trade with Canada at a middle stage of entry into the supply chain, and across imports and exports. Again, as far as these small volume increases indicate, this is consistent with increasing fragmentation of production to specialize and achieve greater efficiency. Of course, including trade in services would show higher volumes of trade with India, and this represents an important area for future research.

Discussion of Key Findings

Chapter Summary

- Canada has followed the global trend of increased trade in parts.
- Canada's recent plateau in middle-point trade with the U.S. could mean either that few remaining gains from such trade exist or that policy barriers prevent companies from accessing them.
- Canada's growth in parts trade with major non-U.S. partners continued in recent years, implying that important efficiency gains from parts trade still exist with these countries.
- Imported inputs play an increasingly important role in feeding Canadian supply chains.
- Canada may play a more limited role in the goods supply chains of the major developing economies we examine.

Overall, this analysis highlights several points related to Canada's role in global supply chains and the role of other countries in Canada's supply chains:

1. *Canada's share of raw material exports has fallen over the past 15 years.* Recent global commodity price increases benefit Canada tremendously. However, when these price effects are removed (in order to show only changes in the trade structure), entry-point goods represent less than one-third of all exports—down from over 40 per cent 15 years ago. It is now the least important overall export category, even with a definition broader than simply raw materials. With the U.S. removed, the share of entry-point goods was higher, at just under 50 per cent in 2005. But that is still a big drop from the massive 70 per cent recorded in 1990. Still, China's explosive growth, among other factors, will likely mean that Canada's entry-point exports remain an area of strong comparative advantage for Canada and a key part of how Canada fits into other countries' supply chains for the foreseeable future.

2. *Since 1990, Canada has increased its trade in inputs that enter other countries' supply chains at a more advanced stage.* Overall, Canada followed the global trend of increased trade in parts. This is consistent with companies in Canada making components more efficiently than elsewhere and exporting them into other countries' supply chains. It is also consistent with these companies improving their competitive position by importing cheaper or better components made elsewhere and using them to make more advanced products.
3. *Canada's middle-point trade with the U.S. seems to have hit a plateau.* Canada–U.S. component trade grew significantly over the 1990s but has actually declined in recent years. This could mean there are limits to any further gains being realized from businesses slicing production into even smaller fragments and trading more across the Canada–U.S. border. Alternatively, it could mean that existing rules, such as regulatory differences between the two countries, act as barriers to further efficiency gains from trade.

Overall, Canada increased its trade in parts, though middle-point trade with the U.S. has plateaued.

4. *Canada's parts trade outside the U.S. has grown significantly in recent years, mostly due to Canadian suppliers using developing country inputs.* Middle-point trade with a number of major economies—such as China, Mexico, India, and Eastern Europe—continued to rise between 2000 and 2005. The continued strong growth in middle-point trade suggests there may still exist important gains to be had from breaking production down further and buying parts from these regions as inputs into Canadian supply chains. This may mean that, despite low current trade volumes, future efficiency-driven middle-point trade growth is more likely to come from Canada's trade outside the U.S.

5. *Canada has limited involvement in global or regional supply chains for large parts of its trade.* Despite large increases in middle-point trade, the volume of developing country parts used in Canadian supply chains far exceeds the volume of Canadian goods inputs into developing countries' supply chains. Even with this large growth in imported inputs,

most of Canada's 2005 imports—from the U.S. and elsewhere—are of final products. So overall, Canada may still have limited involvement in global supply chains (aside from with the U.S., with which it has highly integrated trade in parts that are inputs into those final products).

Implications for Policy-Makers and Business Leaders

Chapter Summary

- Canadian governments should remove remaining barriers to trade and investment, to trade with the U.S. and with other major trading partners, and to trade in both inputs and final products.
- Policy-makers should anticipate some short-term displacement, while appreciating the long-term benefits of trade through productivity gains and higher living standards.
- Business leaders should take a hard look at their supply chains to determine which parts of their process are best done in Canada and which are best done elsewhere.
- Businesses should seize global opportunities to improve their competitive positions, through both exporting and investment.

POLICY

If present trends persist, businesses will continue to align along global or regional supply chains in order to produce goods and services more efficiently. That means competition for those parts of the process that can move from country to country—whether for goods such as electronic components, or services such as data management—will intensify. In this environment, it will be even more critical to create policies that enable Canadian businesses to seize the benefits of increased global involvement. Governments will need to ensure that policies in Canada and elsewhere do not impede companies’ ability to source or buy globally that which others can make more efficiently. (This should, of course, be balanced against other policy considerations.)

In light of the findings of this study and the current global context, policy-makers should:

1. *Remove trade and investment barriers.* Canadian policy-makers should remove barriers that limit companies’ ability to source and produce inputs and final products globally from the most efficient location. Barriers to exports, imports, and inward and outward investment impede Canadian companies’ ability to compete globally and make the most efficient decisions. The bulk of evidence shows that trade and investment increasingly feed off each other in today’s integrated global supply chains. To start, Canada could remove barriers where there is no current policy purpose, or where the key policy objective can be met through other means. Policy-makers might begin with those barriers most within Canada’s control—such as interprovincial trade barriers—where the gains would likely be greatest.
2. *Anticipate some adjustment while recognizing long-term gains.* If a surge in imports of final goods or inputs displaces activity in Canada, some workers will need to adjust in the short term. Government should anticipate this and help them. Over the long term, however, the bulk of evidence shows that trade boosts productivity and therefore living standards, improving outcomes for all Canadians.¹ Such a policy would also have the added benefit of improved outcomes for developing countries.²

1 For evidence on trade’s short-term and long-term effects, see Trefler, Daniel. “The Long and Short of the Canada–U.S. Free Trade Agreement.” *American Economic Review* 94, 4 (2004), pp. 870–895.

2 For a larger discussion of the benefits of trade for poverty reduction, see Goldfarb, Danielle. *Effective Aid and Beyond: How Canada Can Help Poor Countries*. Calgary: Canadian Defence and Foreign Affairs Institute, January 2007.

3. *Remove barriers to trade with the U.S. and other major trading partners.* The bulk of Canada's trade continues to be with the U.S., but there has been little growth in Canada–U.S. trade in inputs in recent years. By contrast, trade—and trade in inputs in particular—with other major economies has continued to grow. To enable companies to take advantage of the best available opportunities, policy-makers should seek to eliminate barriers between Canada and the U.S. and between Canada and other major economies. Remaining Canada–U.S. barriers may impede further efficiency gains from Canada–U.S. supply chains and limit investment in Canada as a vehicle to serve the North American market. If barriers get worse, or border crossing becomes rife with uncertainty, companies can move Canadian production elsewhere over the medium term. With significant growth in Canada's component and other types of trade outside the U.S., Canada should also address trade barriers in the markets where it is likeliest to see the greatest payoffs (such as rapidly growing markets with which Canada already has significant economic activity). Ideally, Ottawa would aim to reduce these barriers through multi-lateral negotiations that will yield the largest gains. Unfortunately, the current round of the World Trade Organization's free trade talks has stalled, as have negotiations for Western hemispheric free trade. More practically, Canadian leaders may address these issues through other regional forums, bilateral deals, or unilateral policies.
4. *Remove barriers to imported inputs.* Companies in Canada chose to significantly increase imported parts from rapidly growing markets over 2000–05. This enabled them to produce their final product or service more efficiently, making their products more competitive globally. Barriers to such trade could therefore jeopardize Canada's ability to attract or retain high value-added production or increase efficiency in areas of Canadian comparative advantage. This ultimately penalizes Canadian prosperity. The size of the penalty increases as trade in parts rises globally. Moreover, a component can cross borders multiple times, in various stages of processing, facing the same trade barriers at each stage. And, unlike raw material extraction, parts production is

not tied to a specific location—it can be moved. As a result, trade in parts is very sensitive to trade barriers. As part of the efforts to eliminate all trade and investment barriers, Canada should continue to work proactively to ensure border security policies slow down illegitimate travel but speed up legitimate economic activity. Policy-makers should also further simplify barriers such as complex rules of origin. These rules are included in all free trade agreements and specify criteria to be met in order for goods to enter a country duty free. The rules increase business input costs by penalizing imported inputs that may be cheaper than those available within the free trade area. In turn, this increases the cost of final goods and reduces Canadian prosperity.

Canada–U.S. trade is overstated and exports to other countries are significantly understated.

5. *Get domestic policies right.* Many parts of production are now mobile. If Canada wants global companies to buy its goods or services inputs, it needs to ensure it has the right tax, education, competition and other domestic policies in place. The evidence suggests that the most effective policy measures for deriving productivity gains from trade are strengthening human capital, infrastructure and institutions.³
6. *Ensure statistics better reflect global supply chain realities.* Traditional trade statistics do not capture the reality of imports feeding into exports at various stages along global or regional supply chains. Canada–U.S. trade is overstated and exports to other countries are significantly understated. Trade in services data are less reliable and published with a lag. Statistics Canada should continue efforts to make the trade data better reflect reality. Where Canada's export data have been reconciled with another country's import data, Industry Canada—which makes the trade data available—should provide a footnote with the export data stating the other country's import volume from the reconciliation study, as well as a link to the study itself.

³ Hildegunn Nordas, et al., *Dynamic Gains from Trade*, OECD Trade Policy Working Paper No. 43 (Paris: OECD, November 2006), p. 21.

BUSINESS

As competition for parts of the production process intensifies, Canadian business leaders need to ensure they are taking advantage of global opportunities. Businesses should consider the following strategies in light of this report's findings and global trends:

1. *Businesses should examine which parts of their process are best done in Canada and which parts are best done elsewhere.* Among other pressures, the aging of the Canadian population and the associated labour shortages will force companies to look for new alternatives to maintain their growth. This report's findings suggest that Canadian companies may not be taking full advantage of opportunities to source globally and improve their competitive position. Businesses should invest or source globally if it will improve their competitiveness (assuming all else is equal, and after appropriate due diligence). Canadian exporters that understand the global supply chain model of trade, based on both exporting and investment, can seize opportunities to increase their competitive positions. If businesses lose their Canadian activities, they should turn this into an opportunity to refocus.
2. *Businesses should keep in mind where future gains from parts trade are likely to occur.* Though individual businesses need to do their own cost-benefit calculations and carefully weigh the risks, they should keep in mind that the gains from increased breaking down of production between Canada and the U.S. may be limited unless policy-makers remove remaining trade and competitive barriers.

Conversely, even though trade volumes are small, there may still be important gains to be made from parts trade with rapidly growing developing markets and non-U.S. developed markets.

Businesses must constantly reassess how they allocate production within Canada and across national borders, in response to quickly changing conditions.

3. *Businesses in Canada could move to higher value-added activities in which they have a comparative advantage.* Canada increased its parts and final product imports from a number of rapidly growing economies over 2000–05. This indicates that these low-cost countries are more efficient at producing these items, and Canada is better off specializing in other areas. Businesses should consider ways to improve their efficiency in areas of comparative advantage and to move into areas in which they can compete. Services are one important potential growth area in which Canada has underperformed relative to its peers.⁴
4. *Businesses must be nimble and reassess their business model constantly.* Global supply chains are dynamic. Businesses must constantly reassess over time how they allocate production within Canada and across national borders, in response to quickly changing conditions.

⁴ See the discussion of this issue in Hodgson, Glen, and Anne Park Shannon. *Mission Possible: Stellar Canadian Performance in the Global Economy*. The Canada Project. Final Report. Volume I, (Ottawa: The Conference Board of Canada, 2007).

Conclusions and Future Research

Chapter Summary

- This study is a first step toward measuring in more concrete terms Canada's role in global supply chains and what it means for decision-makers.
- Raw materials exports are, and will continue to be, an important part of Canada's contributions to other countries' supply chains, but their role has diminished.
- Canadian trade in more advanced inputs plays a much more important role today than in the past—and more so for imported inputs.
- Overall, Canada appears to be more integrated in global or regional supply chains than in the past, though much Canadian trade may not involve Canadian inputs into global production at all.

This study attempts to measure in more concrete terms Canada's role in global production. By looking at Canada's trade through the buyers' lens, it takes a step toward identifying how major economies incorporate Canadian goods and services into their national or regional supply chains. It also examines at what stages Canada uses other countries' inputs in its own production processes. The broader objective is to better inform business and government leaders about Canada's current role in global supply chains in order to help them determine how best to seize global economic opportunities.

Clearly, Canada's role in global supply chains has changed. Canada has benefited significantly from recent global commodity price increases. But once these price effects are stripped out, the data show that the country has moved away from its raw materials and other goods entering other countries' supply chains at an early stage. Still, entry-point goods represent one-third of all exports and—given the large demand from rapidly growing economies such as China—will likely continue to play an important role in Canada's prosperity.

Over the 1990s, Canada followed the global trend of important increases in trade in parts. Businesses increasingly bought inputs regionally from where they were made most efficiently. More recently, Canada's middle-point trade with the U.S. hit a plateau. This could mean either that few remaining gains from such trade exist to be exploited, or that policy barriers prevent companies from accessing them. By contrast, middle-point trade with other major economies continued to grow in recent years. This suggests that companies can still achieve important efficiency gains from parts trade with these partners.

The study also found that Canada's imported inputs from major developing countries play an increasingly important role in feeding Canadian supply chains, but Canada may play a more limited role in the goods supply chains of the major developing economies examined.

Policies should address barriers that could impede further gains from Canada–U.S. trade, while also removing barriers that affect other major markets.

Canadian businesses may not be taking full advantage of global and regional opportunities, despite expected benefits to Canadian prosperity from increased global involvement. Global supply chains present opportunities. For businesses to seize these opportunities and maintain global competitiveness, policy-makers need to simplify or eliminate trade and investment barriers. This will allow businesses to make efficient decisions—to specialize in what they make most efficiently and to buy globally that which others make more efficiently. Policies should address barriers that could impede further gains from Canada–U.S. trade, while also removing trade barriers that affect other major markets. Canada's global success and ability to attract global investment depends critically on effective domestic policies such as eliminating interprovincial trade barriers and improving infrastructure.

Business leaders will need to be pragmatic in assessing which activities should be done in Canada, and which are better done elsewhere, to maintain or enhance their competitive position globally. They will need to weigh the opportunities presented by the massive volume of Canada–U.S. trade in parts against fast-growing opportunities for trade in parts with other major economies.

This study is a starting point in the effort to describe Canada’s role in global and regional economic linkages and what it means for this country’s leaders. The Conference Board recommends the following extensions for future research:

1. *Services* Due to data limitations, the study examined only trade in goods. But services are a key part of global supply chains. Future research should examine the extent to which Canada is engaging or has the potential to engage in global supply chains through services. This is important because, while services are increasingly tradable and may represent relatively high value-added activities, Canada ranks near the bottom of the 30-member OECD in services trade as a share of GDP.
2. *Multiple country supply chains* This study examined Canada’s bilateral trade patterns. But global or regional supply chains often involve the use of parts and assembly in more than two countries, and it could be that Canadian goods and services enter global supply chains through U.S.-based multinationals.
3. *Supply chains from conception to delivery* This study focused on production activities. But future research must examine the full range of economic activities, from conceiving of a product or service, through to marketing and delivery.
4. *Comparisons with peers* An extension could compare Canada’s stage of entry into supply chains with the degree of involvement of its major competitors in global supply chains.
5. *Foreign direct investment and sales* A more complete analysis of global supply chains would examine foreign direct investment flows and sales from foreign affiliates to determine whether those findings reinforce the trade findings in this study.
6. *Dynamics of global supply chains* Global supply chain linkages change frequently. Future studies should examine how patterns change over the next few years.

Future research should examine the extent to which Canada is engaging or has the potential to engage in global supply chains through services.

The Conference Board of Canada’s International Trade and Investment Centre intends to build on this study and address some of these extensions in future. In particular, the Centre plans to track a supply chain for a particular industry throughout its global or regional activity in order to paint a more realistic picture of Canada’s changing role in global supply chains.

Related Products and Services

- **International Trade and Investment Centre**

The Centre aims to help Canadian leaders better understand what global economic dynamics—such as global and regional supply chains—mean for public policies and business strategies. The Centre brings together business and government leaders in an off-the-record forum to discuss successful trade and investment strategies. The Centre’s independent, evidence-based reports propose effective policy and business solutions for improving Canada’s trade and investment performance.

- **Mission Possible: Sustainable Prosperity for Canada—Volume I: *Mission Possible: Stellar Canadian Performance in the Global Economy***

This volume focuses on the investments, strategies and priorities that will improve our productivity and competitiveness. It takes a comprehensive look at the dominant forces reshaping the global economy, assesses Canada’s performance and potential in adapting to these forces, and outlines five strategies for positioning Canada to remain among the top nations. It offers a blueprint for building a new era of economic prosperity through policies and practices rooted in long-term sustainability and success.

- **The NAFTA Effect: Multinational Enterprises in Canada**

Based on a detailed survey of senior management representatives from 62 multinational enterprises (MNEs), this report examines the roles and characteristics of MNEs operating in Canada during the post-NAFTA period.

- **The Exchange Rate and Wages: How They Affect Capital Investment**

This study concludes that currency depreciations have significant negative effects on investment in physical capital. An increase in real wages without a corresponding increase in labour productivity, therefore, would have important negative consequences for investment in the medium and long term.

- **Opportunity Begins at Home: Enhancing Canadian Commercial Services Exports**

Global exports of commercial services are growing significantly, but Canada has not kept pace with other major countries. This study proposes the elements of a national strategy for boosting commercial services exports.

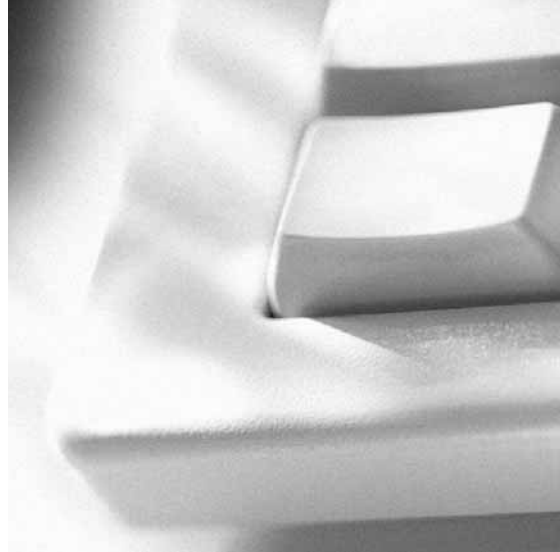
- **Death by a Thousand Paper Cuts: The Effect of Barriers to Competition on Canadian Productivity**

This report examines the extent of the barriers to competition in Canada and explores their impact on productivity. The report concludes that productivity could be enhanced by eliminating barriers to competition in a core group of primary and manufacturing industries.

- **In Search of a New Equilibrium in the Canada–U.S. Relationship**

The need for a new equilibrium in bilateral relations with the United States has been widely recognized. The report highlights four areas that Canada should focus on: border security, Canada’s role in American strategy, access to the U.S. market, and our relationship with the United States.

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