

# **Canada's Pharmaceutical Balance of Trade**

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## Executive Summary

- C Exports have increased at almost twice the annual rate of imports over the last six years - 30% per year compared with 18.8%.
- C Exports by PMAC-member companies represented approximately 80% of pharmaceutical exports in 1995, with annual increases averaging approximately 32% since 1991.
- C Exports by the generic industry have increased an average of 52% per year since 1991.
- C Since 1993, the increase in Canada's trade deficit in pharmaceuticals has slowed to approximately 5% per year from its 1981 to 1993 annual average of 18% and was only 3.8% in 1996.
- C The improvement in Canada's pharmaceutical trade deficit has coincided with the strengthening of Canada's patent laws and increased R&D expenditures in Canada.
- C At current rates of growth in exports and imports, increases in Canada's pharmaceutical trade deficit would end in the year 2004 and the deficit eliminated by the year 2008.
- C A further strengthening of patent protection through the introduction of patent term restoration would bring Canada's patent laws in line with its major trading partners, and promote further growth in the industry, including exports.

## 1.0 INTRODUCTION

The purpose of this study is to develop an economic analysis of the Canadian balance of trade in pharmaceuticals. The study will present historical trends in pharmaceutical trade, make comparisons with other high technology sectors and outline opportunities and challenges for the future.

The pharmaceutical industry is an international industry with estimated worldwide sales of \$340 billion<sup>1</sup>. The largest geographical markets are located in the U.S., followed by Europe and then Japan. The industry is highly technological, research-based and heavily regulated. The cost of research and development (R&D) in the pharmaceutical industry is one of the highest rates of any industry, largely due to the cost of discovering, testing and gaining approval for new drugs. It is by nature, high risk.

Canada's pharmaceutical industry is made of up of Canadian subsidiaries of multi-national brand name pharmaceutical manufacturers, domestic brand name pharmaceutical and biotechnology companies as well as domestic generic manufacturers. The industry is oriented toward the domestic market, although some firms have regional or global mandates for specific products. According to the Patented Medicine Prices Review Board, Canada accounted for approximately 2 percent of the world pharmaceutical market in 1995. Its domestic market ranked eighth in 1995 and 1996 compared with the top seven Western European markets, the U.S. and Japan<sup>2</sup>. Canada's major pharmaceutical trading partners include the United States, Switzerland, the United Kingdom, Sweden and Germany.

## 2.0 DATA SOURCES

The trade data which form the basis of this study is sourced from Statistics Canada's catalogue 65-202 (Exports, Merchandise Trade) and 65-203 (Imports, Merchandise Trade) under summary grouping Medicinal and Pharmaceutical Products, in Dosage. This summary groupings is a subset of the Harmonized System's (HS) Chapter 30 - Pharmaceutical Products and includes only medicinal products exported and imported in final dosage form. This summary grouping was chosen for this study because it represents published data which include only medicinal products and are consistent in content from country to country based on the Harmonized System codes.

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Source: Patented Medicine Prices Review Board, Eighth Annual Report for the Year Ended December 31, 1995.

2

Source: Scrip Magazine, January 1996 and January 1997.

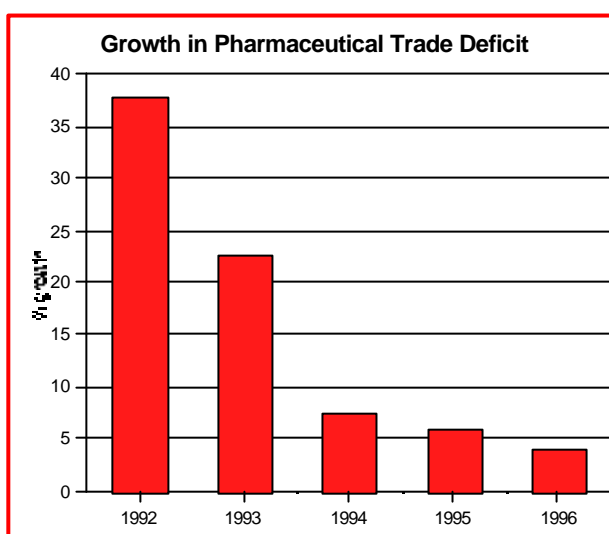
Statistics Canada publishes other import and export pharmaceutical trade data. However, these sources contain information which is either inconsistent for comparison purposes, according to Statistics Canada, or contain trade data related to both medicinal and non-medicinal items.

A detailed description of these published data sources is included as Appendix 1.

### 3.0 BALANCE OF TRADE - PHARMACEUTICALS

Source: Statistics Canada - see Appendix 2  
(1996 based on annual estimate using January -October 1996 data)

In 1996, Canada had a balance of trade deficit estimated to be \$1.3 billion, up only 3.8% from 1995. With the exception of 1985, the deficit has been increasing every year since 1981. However, a rapid growth in exports over the last six years has slowed the increase in Canada's pharmaceutical trade deficit to about 5% per year since 1993. Prior to that time, increases averaged 18% per year with year-over-year increases in many instances well over 20% since 1981. (Appendix 2)

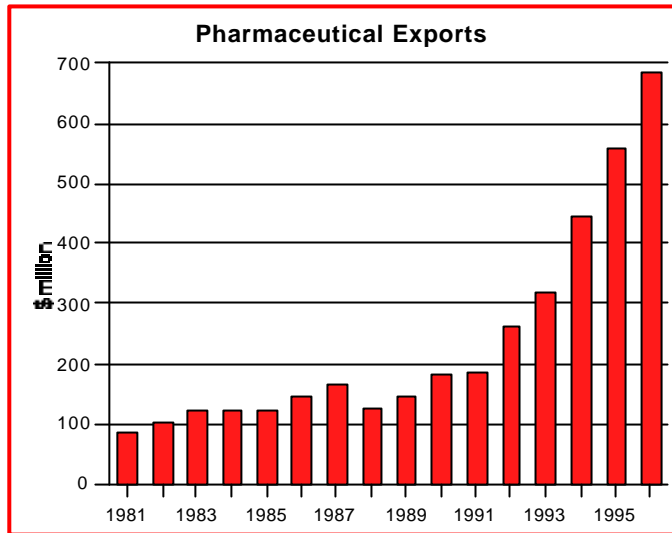


Over half of Canada's pharmaceutical trade deficit results from trade with the United States, its main trading partner. From 1991 through 1994, the U.S. portion of the total pharmaceutical trade deficit has ranged from 56% (1991) to 64% (1993). However, the U.S. share has since dropped to 52% in 1995 and 1996. Although small, Germany and Italy's representative portions have also dropped in recent years. On the other hand, both Switzerland and Sweden have increased their pharmaceutical trade surpluses with Canada over the last six years. In 1991, they represented a combined 15% of Canada's trade deficit in pharmaceuticals. The 1996 data put their combined share at 23%. Canada's pharmaceutical trade deficit with the U.K. has remained fairly constant at approximately 10%. (Appendix 3)

### 3.1 Exports

Source: Statistics Canada - see Appendix 2  
(1996 values estimated using January-October 1996 data.)

Exports of pharmaceutical products increased significantly between 1981 and 1996. However, the largest increases have occurred since 1991. Between 1981 and 1991, exports grew at an average annual rate of 8% (from \$85 million to \$183 million). In 1996, exports more than tripled to \$686 million from their 1991 level - an average annual increase of just over 30%. Based on the Pharmaceutical Manufacturers



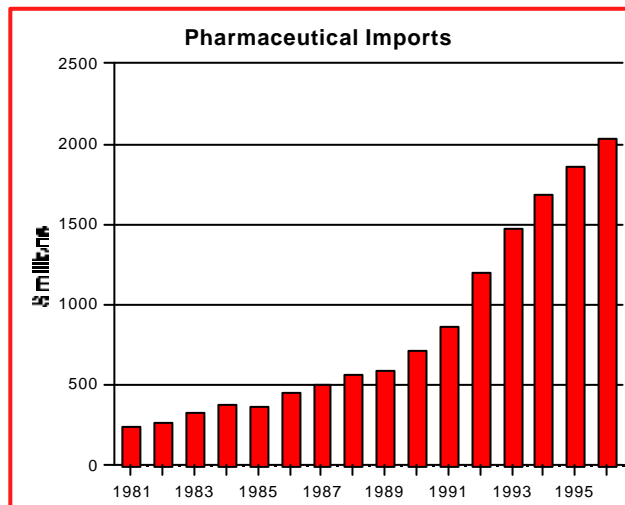
Association of Canada (PMAC) annual survey compiled by Deloitte and Touche, exports by PMAC-member companies represented approximately 80% of pharmaceutical exports in 1995 with annual increases averaging approximately 32% since 1991.

Pharmaceutical exports' share of domestic shipments has also been increasing - from 6% in 1981 to just over 15% in 1996. With domestic shipments increasing over that same period at an average annual rate of 8.5% (3.5% annually over the last six years) and its share of the domestic market dropping from 90% in 1981 to 77% in 1996, the increase in domestic shipments has been directed towards the export market. (Appendix 2)

### 3.2 Imports

Source: Statistics Canada - see Appendix 2  
(1996 estimated using January-October 1996 data.)

The value of pharmaceutical imports into Canada has also increased significantly over the last fifteen years. In 1996, imports totaled \$2 billion compared with the \$239 million worth of pharmaceutical products imported into Canada in 1981. This represents an average annual increase of just over 15% since 1981 with the highest year-over-year increase recorded in 1992 at almost 39%. The value of imports has



more than doubled between 1991 and 1996 (from \$0.86 billion to \$2.0 billion) representing an average annual increase of 18.8%. However, since 1992 increases in the value of imports have slowed considerably. In 1995 and 1996, imports increased by only 10%.

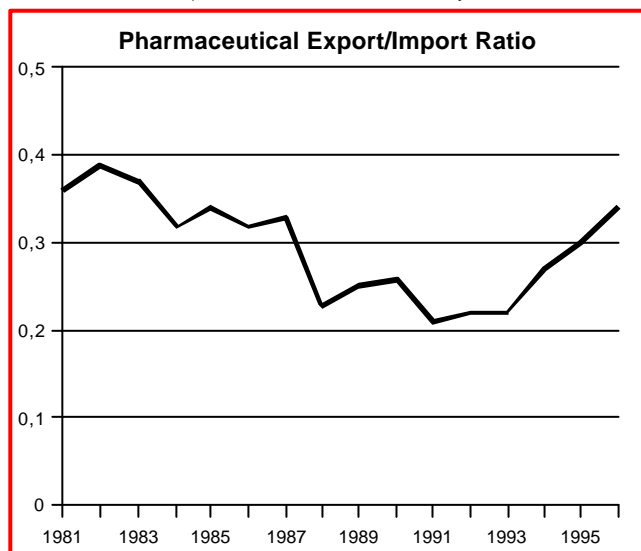
Pharmaceutical imports penetration of the domestic market has increased from 16% in 1981 to 35% in 1996. Over that same period, domestic shipments' share has dropped from 90% to 77% of the domestic market in 1996.

The value of imports are exchange-rate sensitive. The analysis in this study is based entirely on the actual value of imports as reported by Statistics Canada. However, since trade with the U.S. represents the largest portion of Canada's international trade, it is important to note that average annual U.S. exchange rates over the period 1981 through 1996 have fluctuated from a low of 1.1457 (recorded in 1991) to a high of 1.3895 (in 1986). As the exchange rate increases or decreases, so does the value of imports into Canada. For example, when normalized to 1991 exchange rates when the Canadian dollar was strong, the value of imports in 1996 drops by 16% to \$1.7 billion from its actual reported value of \$2 billion and the average annual growth rate since 1991 drops to 14.7% from 18.8%. For information purposes a table demonstrating the effect changes in exchange rates can have on the value of imports has been included as Appendix 4.

### 3.3 Export/Import Ratio

While Canada is historically a net importer of pharmaceuticals, its export/import ratio has improved in the last few years. From 1981 to 1987, pharmaceutical imports represented approximately three times the value of exports. Although there are yearly fluctuations, between 1987 and 1991 there was an overall decrease in the ratio from 0.33 down to 0.21. The value of imports was at approximately five times that of exports by 1991. Since then, the export/import ratio has climbed back to its pre-1987 level with the most significant rise beginning in 1993 - the result of faster growing exports. The pharmaceutical export/import ratio for 1996 is estimated at 0.34.

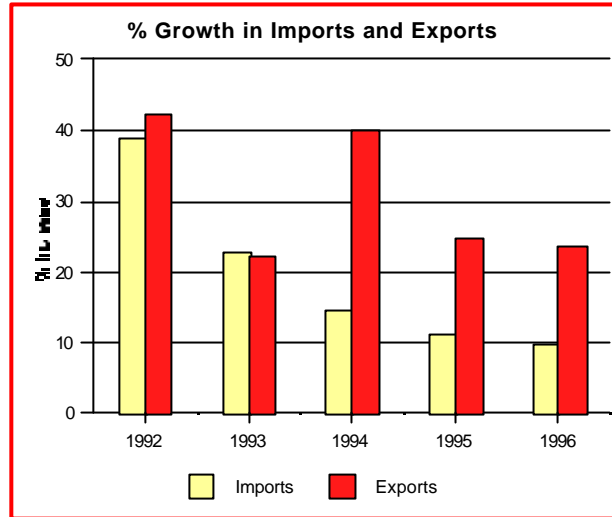
Source: Statistics Canada - see Appendix 2  
(1996 estimated based on January to October 1996 data)



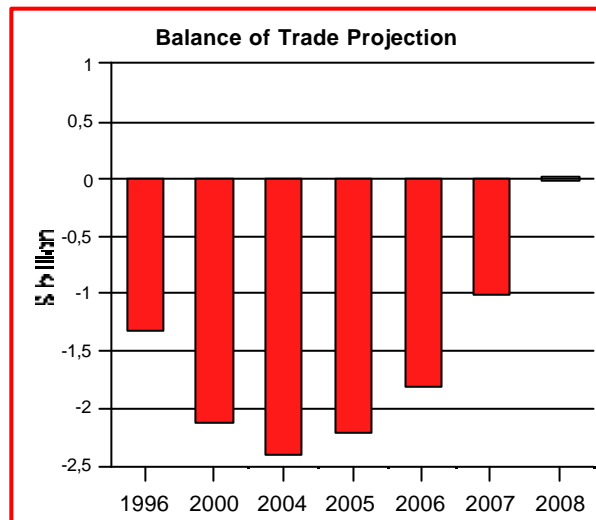
### 3.4 Prospects for the Future

From 1981 through 1991, the annual increase in pharmaceutical imports averaged approximately 14% compared with 8% for exports. However, over the last few years, the value of exports has been growing at a much faster rate than have imports. Exports have increased an average of 30.2% per year over the period 1991 to 1996 compared with 18.8% for imports. As can be seen from the chart at right, the year-over-year increases in pharmaceutical exports since 1993 have been dramatic when compared to the increases in the value of imports.

Source: Statistics Canada - see Appendix 2  
(1996 based on annual estimate using January -October 1996 data)



The marked improvement in Canada's pharmaceutical balance of trade over the last few years has coincided with increased R&D expenditures in Canada and the strengthening of Canada's patent laws. Assuming that pharmaceutical exports and imports continue to grow at an average annual rate of 30.2% and 18.8% respectively as they have since 1991, it is projected that the deficit will begin to decline in 2004 and disappear by 2008. However, because the current pharmaceutical balance of trade deficit is large (i.e. \$1.3 billion), the deficit will continue to increase between 1996 and 2003 when it will peak at \$2.4 billion. The actual balance of trade in pharmaceuticals for these years will of course depend upon many factors, including the ability of Canada, relative to other countries, to attract investment and R&D. This in turn is dependent upon the regulatory regime and the level of patent protection available in Canada.



#### **4.0 OTHER HIGH TECHNOLOGY SECTORS**

In a fiercely competitive international environment, innovative new products are vitally important. The telecommunications and computer industries each have unique situations in the Canadian and global marketplace. In terms of balance of trade, the pharmaceutical sector most closely resembles the Canadian computer industry. However, in terms of growth and development, the telecommunications area is an excellent study of the potential for export growth. Appendix 5 offers a comparison of trade in pharmaceutical industry with that of the telecommunications and computer technology sectors.

##### **4.1 Computers**

The Canadian computer industry's make-up is very similar to that of the pharmaceutical industry. It is comprised of Canadian subsidiaries of multinational corporations such as IBM Canada, Digital Equipment of Canada, and Hewlett-Packard Canada and smaller niche-market domestic firms. These Canadian-owned firms concentrate on developing specialized product lines for regional and world markets.

In contrast to the pharmaceutical industry, access to markets for the computer industry has typically not been a problem. The industry is not heavily regulated. The finished products are shipped to parent companies which distribute them to markets around the world.

As with the pharmaceutical sector, the computer industry has also had a prolonged trade deficit. Canada imports almost all of its computer requirements (i.e. mainframes, mini- and micro-computers and copiers). In 1994, the value of imports totaled \$9.6 billion compared with \$5.2 billion in 1990, an average annual increase of 16%. During that same period, exports increased by 21% per year to approximately \$6 billion in 1994.

The Canadian computer industry's 1994 trade deficit was approximately \$3.6 billion, up from \$2.4 billion in 1990. While the computer industry has the largest trade deficit compared to the pharmaceutical and telecommunications sectors, its domestic manufacturing is growing the fastest. In 1994, the Canadian computer industry shipped close to \$6 billion worth of goods compared with \$2.8 billion in 1990, representing an increase of 19% per year and a 74% increase over 1993.

## **4.2 Telecommunications**

Canada is a leader in the application of advanced telecommunications technology. The country's vast size, widely distributed population and harsh climate have created a unique demand for innovative long-distance telecommunications technology services in Canada. However, it is international demand which has fostered the growth of the industry and made it profitable for the Canadian telecommunications sector to research, develop and produce goods which, based on the small Canadian market, would otherwise not be profitable. Unlike the computer and pharmaceutical industries, the Canadian telecommunications industry is dominated by domestic companies. As with other industrialized countries, the Canadian telecommunications sector grew out of a telephone company that enjoyed a state sanctioned monopoly.

Unlike the Canadian pharmaceutical industry, the telecommunications sector has always enjoyed full patent protection in Canada for its intellectual property. As such, domestic firms have benefited from a stable window of opportunity in which to recoup their high research and development costs. This protection has provided Canadian telecommunications companies with one of the incentives needed to invest in the high-risk development of unique and innovative new products.

Both the pharmaceutical industry and the telecommunications industry face market access challenges abroad. The pharmaceutical industry is heavily regulated within each market and, while some common standards have been developed, individual government approvals must be received. Since telecommunications are still largely protected in many markets, firms must often establish manufacturing facilities in key markets to sell their goods. Its biggest barriers to entry are also product approval and registration.

The telecommunications industry has historically posted trade surpluses in telecommunications equipment. In 1994, it recorded a trade balance surplus of \$520 million, the result of a 31% increase in exports over the previous year. Between 1990 and 1994, domestic shipments increased on average by 5.5% per year while imports and exports grew at annual rates of 13% and 17% respectively. Over that same period, the pharmaceutical industry averaged increases of 5.6%, 24% and 25% per year for domestic shipments, imports and exports respectively.

## **5.0 OPPORTUNITIES FOR GROWTH AND IMPROVED BALANCE OF TRADE**

Although the Canadian deficit in the balance of trade in pharmaceuticals will likely continue for some time, there are opportunities for further improvements, particularly in the innovative pharmaceutical sector. Favorable economic conditions in Canada have created a positive environment for long-term investments. In recent years, Canada has maintained a stable currency and low inflation. Interest rates in 1996 hit their lowest level in more than fifty years. To take advantage of these opportunities, it will be important to maintain a careful balance between regulations governing the pharmaceutical industry and incentives for further investment.

### **5.1 Global/Regional Mandates**

In recent years, there has been a shift in the pharmaceutical industry towards regional and global mandates for particular products. The relaxed trade barriers brought about by the North American Free Trade Agreement (NAFTA) offer opportunities for growth in the North American regional market. The establishment in Canada of a manufacturing site designed specifically to supply a North American regional market, or a global market, with one or two of the world's top-selling medicines could eliminate Canada's pharmaceutical trade deficit. However, Canada must compete with other countries for these mandates. Therefore, these opportunities should be coupled with incentives for increased investment in the manufacturing area. A continued improvement in regulatory approval systems and time to market can provide new products with a better opportunity of being first to market in Canada. This in turn could lead to the acquisition of regional or global markets for those products.

### **5.2 Biopharmaceuticals**

Canada has a young and promising innovative biopharmaceutical industry. As with Canada's telecommunications industry, the biotechnology industry is among the world leaders in R&D. The growth of the Canadian biotechnology industry has been dramatic since changes to the Patent Act, through Bill C-91, were put in place in 1993.

According to Ernst & Young there are, as of 1996, 224 biotech firms in Canada compared with fewer than a dozen before 1990. Their numbers increased by 150 core companies between 1994 and 1996 alone. Of these, 59 percent focus on healthcare. The biopharmaceutical industry has nearly doubled since the passage of Bill C-91 in 1993<sup>3</sup>. Many have formed

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<sup>3</sup>

Source: Ernst & Young Industry Analysis.

alliances with brand name pharmaceutical companies in Canada who, along with their own biopharmaceutical products, will be responsible for the development, regulatory approval and marketing of these innovative Canadian-based discoveries. In the future, as these biopharmaceutical companies reach economies of scale, they will become responsible for the manufacture and distribution of their own products with less need to ally themselves with larger companies.

Canada's trade balance in pharmaceuticals stands to gain from the R&D activities directed towards biopharmaceuticals. Canadian researched and developed biopharmaceutical products have already been approved and sold in world markets. Many others are in development both by multi-national pharmaceutical companies operating in Canada and by Canadian-based pharmaceutical and biopharmaceutical companies. The Canadian development of biopharmaceuticals could eliminate Canada's trade deficit in pharmaceuticals. In fact, a single breakthrough drug can dramatically improve a country's trade balance. For example, Losec (omeprazole), manufactured by Astra Pharma of Sweden, generated world sales of more than \$Cdn3.5 billion<sup>4</sup> in 1996 (almost three times Canada's pharmaceutical balance of trade deficit). As Canadian firms continue to introduce innovative new products, such as 3TC (lamivudine) and Photofrin (porfimer sodium), the potential exists to develop in Canada, a blockbuster drug like Losec.

Canada's position as a world leader in biopharmaceutical development should be protected. This industry, which has already undergone major growth in the last few years, is in position for significant world market growth. The maintenance of protection afforded under current patent laws will provide the incentive for investment, and promote continued innovation in this field. The further strengthening of patent protection has the potential to accelerate this industry's growth.

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<sup>4</sup>

Source: Astra Pharma ([www.astra.com](http://www.astra.com))

### **5.3 Balancing Regulations with Legislation Promoting Investment**

Recent trends in the pharmaceutical industry confirm that legislative changes made since 1987 strengthening Canada's pharmaceutical patent laws, first through Bill C-22 and then through Bill C-91, have resulted in significant growth within the pharmaceutical industry. The increased patent protection has provided the incentive for increased Canadian R & D spending in the pharmaceutical sector. This in turn has resulted in the emergence of Canada as a serious player in the field of biopharmaceuticals. Since the passage of Bill C-91, exports of pharmaceutical products have increased at an average rate of 30% per year leading to an improved balance of trade over the last three years.

The current regulations governing the prices of patented medicines are also effective. In its Eighth Annual Report, the Patented Medicine Prices Review Board (PMPRB) reported that the Consumer Price Index increased by 2.14% in 1995 compared with a 1.75% overall price decrease for patented medicines - the second year in a row that the PMPRB reported an overall patented medicine price decrease. In addition, since 1988, the year-over-year changes in the pharmaceutical component of the Industrial Products Price Index (IPPI) published by Statistics Canada have consistently been higher than the changes in the Patented Medicine Price Index as measured by the PMPRB.

Some countries have introduced changes to their patent laws which compensate pharmaceutical companies for lengthy research efforts or delays in the regulatory review process. This patent term restoration (PTR), in place in Europe, Japan and the U.S. has strengthened their patent laws by increasing the life of a patent to a maximum of 25 years. Canada's current laws, as established by Bill C-91, provide the minimum 20 year patent protection and place Canada at a competitive disadvantage with its major trading partners. Strengthening patent protection through PTR would bring Canada in line with other countries and promote further growth in the industry. Current pricing regulations will ensure that the balance between strengthened legislation and consumer protection is maintained.

### **5.4 Export Growth in the Generic Sector**

Future export growth for the Canadian generic industry is, at best, limited. The U.S. market, although large, is very competitive. It is flooded with domestic generic companies of its own competing for their share of hospital and managed care organizations' fixed budgets. The access to this market, and other countries, is further complicated by regulatory approval processes which are best approached from within. The Canadian generic industry has

recognised this fact and has established subsidiary companies and formed alliances with generic companies in various countries. This strategy is intended to facilitate market entry and not to circumvent Canadian patent laws. Exports by the generic industry have increased at an average annual rate of 52% since 1991. Even so, these exports totaled only \$150 million dollars in 1995<sup>5</sup> and have, over the last few years, represented between 20 and 30% of total pharmaceutical exports from Canada.

## 6.0 CONCLUSIONS

Since 1981, pharmaceutical imports and exports have increased significantly. Although the value of imports has more than doubled the 1991 levels, exports have increased at almost twice the annual rate of imports over the last six years - just over 30% per year compared with 18.8% respectively. While the brand name pharmaceutical manufacturers have traditionally concentrated on the domestic market, this industries' share of total Canadian exports has ranged between 70% and 80% since 1991. Exports by the generic industry have increased at an average annual rate of 52% since 1991.

Investment by the innovative pharmaceutical industry in Canada has increased dramatically since the strengthening of Canada's patent laws. The improvement in Canada's pharmaceutical trade deficit has coincided with this increase. Since 1993, the increase in Canada's trade deficit in pharmaceuticals has slowed to approximately 5% per year compared with annual increases of well over 20% from 1981 through 1992. The balance of trade deficit in pharmaceuticals for 1996 was \$1.3 billion, an increase of only 3.8% from 1995. At current rates of growth for both pharmaceutical exports and imports, Canada's longstanding pharmaceutical trade deficit will be eliminated by the year 2008.

The balance of trade in pharmaceuticals stands to gain from increased R&D and manufacturing mandate activities being carried out by Canada's innovative pharmaceutical industry both in the area of biopharmaceuticals and traditional medicines. The elimination of the pharmaceutical trade deficit could be accelerated with the development of new incentives for investment to promote continued improvement.

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<sup>5</sup>

Source: Canadian Drug Manufacturers Association.

Canada's current patent laws provide the minimum 20-year patent protection and place Canada at a competitive disadvantage with its major trading partners. Trends in the pharmaceutical industry in the 1990's provide evidence of the effects of stronger patent legislation. A further strengthening of pharmaceutical patent protection by introducing patent term restoration, as have its major trading partners, would bring Canada in line with these countries. Current patented medicine pricing regulations will ensure, as they have in the past, that the balance between strengthened legislation and consumer protection is maintained.

## Pharmaceutical Export and Import Data Sources

Statistics Canada provides various sources of published pharmaceutical export and import data. Chapter 30 (Pharmaceutical Products) of the Harmonized System (HS) of commodity codes includes not only medicinal but non-medicinal items such as bandages, first-aid kits and surgical/dental material. The by-industry data captured under the standard industrial code (SIC) 3741 (Pharmaceutical and Medicine Industry) also comprises trade data which is not strictly medicinal and, according to Statistics Canada, contains information which is inconsistent for comparison purposes. Summary groupings 54010 (exports) and 59010 (imports) entitled "Medicinal and Pharmaceutical Products, in Dosage" is a subset of Chapter 30 of the HS commodity codes and includes only medicinal products in final dosage form.

Each of these published pharmaceutical trade data have limitations in that they either include information on items not considered strictly medicinal or do not contain all medicinal items. Although outside of the scope of this study, a hybrid system could be developed in consultation with Statistics Canada and Industry Canada which would better represent the balance of trade in pharmaceuticals. This hybrid system would combine the summary groupings 54010 and 59010 (Medicinal and Pharmaceutical Products, in dosage) with the other relevant medicinal items from the Chapter 30 HS commodity codes.

A detailed description of the contents of each of these data sources follows:

### 1) Chapter 30: Pharmaceutical Products Harmonized System (H.S.) Commodity Codes

The trade information captured under Chapter 30 of the HS commodity classification system and published by Statistics Canada in catalogues 65-202 (Exports, Merchandise Trade) and 65-203 (Imports, Merchandise Trade) comprises all pharmaceutical products including both medicinal (in bulk and in dosage) and non-medicinal items as follows:

- 30.01 Glands and other organs for organo-therapeutic uses, dried, whether or not powdered; extracts of glands or other organs or of their secretions for organo-therapeutic uses; heparin and its salts; other human or animal substances prepared for therapeutic or prophylactic uses, not elsewhere specified or included.
  - 3001.10 *Glands and other organs, dried, powdered or not, for therapeutic use*
  - 3001.20 *Extracts of glands or other organs, or their secretions, for therapeutic use*
  - 3001.90 *Other (heparin & its salts; human or animal substances for therapeutic or prophylactic uses)*
  
- 30.02 Human blood; animal blood prepared for therapeutic, prophylactic or diagnostic uses; antisera and other blood fractions and modified immunological products, whether or not obtained by means of biotechnological processes; vaccines, toxins, cultures of micro-organisms (excluding yeasts) and similar products.
  - 3002.10 *Antisera and other blood fractions and modified immunological products, whether or not obtained by means of biotechnological processes*
  - 3002.20 *Vaccines for human medicine*
  - 3002.30 *Vaccines for veterinary medicine*
  - 3002.90 *Other (human blood; animal blood for therapeutic, prophylactic or diagnostic uses; microbial preparations)*
  
- 30.03 Medicaments (excluding goods of heading No. 30.02, 30.05 or 30.06) consisting of two or more constituents which have been mixed together for therapeutic or prophylactic uses, not put up in measured doses or in forms or packings for retail sale.
  - 3003.10 *Penicillins or streptomycins and their derivatives, formulated, in bulk*
  - 3003.20 *Other antibiotics, formulated, in bulk*
  - 3003.31 *Insulin, in bulk*
  - 3003.39 *Hormones, formulated, not containing antibiotics, in bulk, a/t contraceptives*
  - 3003.40 *Alkaloids or their derivatives, formulated, not containing antibiotics or hormones, in bulk*
  - 3003.90 *Other medicaments, formulated, in bulk*

(Chapter 30 - continued)

- 30.04 Medicaments (excluding goods of heading No. 30.02, 30.05 or 30.06) consisting of mixed or unmixed products for therapeutic or prophylactic uses, put up in measured doses or in forms or packings for retail sale.
- 3004.10 *Penicillins or streptomycins and their derivatives, in dosage*
  - 3004.20 *Other antibiotics, in dosage*
  - 3004.31 *Insulin, in dosage*
  - 3004.32 *Adrenal cortical hormones, in dosage*
  - 3004.39 *Hormones, not containing antibiotics, in dosage, a/t contraceptive*
  - 3004.40 *Alkaloids or their derivatives, not containing antibiotics or hormones, in dosage*
  - 3004.50 *Other medicaments containing vitamins and their derivatives, in dosage*
  - 3004.90 *Other medicaments, in dosage*
- 30.05 Wadding, gauze, bandages and similar articles (for example, dressings, adhesive plasters, poultices), impregnated or coated with pharmaceutical substances or put up in forms or packings for retail sale for medical, surgical, dental or veterinary purposes.
- 3005.10 *Adhesive dressings and other articles having an adhesive layer*
  - 3005.90 *Dressings and similar articles, impregnated or coated or packaged for medicinal use*
- 30.06 Pharmaceutical goods specified in Note 4 to this Chapter.
- 3006.10 *Sterile surgical catgut, similar sterile suture materials and sterile tissue adhesives for surgical wound closure; sterile laminaria and sterile laminaria tents; sterile absorbable surgical or dental haemostatics*
  - 3006.20 *Blood-grouping reagents*
  - 3006.30 *Opacifying preparations for x-ray examinations; diagnostic reagents designed to be administered to the patient*
  - 3006.40 *Dental cements and other dental fillings; bone reconstruction cements*
  - 3006.50 *First-aid boxes and kits*
  - 3006.60 *Contraceptive preparations based on hormones or spermicides*

## 2) Standard Industrial Classification (SIC) - Pharmaceutical and Medicine Industry

Trade data by standard industrial classification (SIC) published by Statistics Canada is an approximated regrouping of import and export commodity data collected and tabulated on the basis of the HS System. The SIC code definitions are not consistent between Canada and the United States. Statistics Canada warns users that the trade data tabulated by SIC can differ in scope and coverage, valuation and timing from other economic series and should be viewed as crude approximations. The information included in SIC code 3741 "Pharmaceutical and Medicine Industry" is comprised of all trade related to companies primarily engaged in manufacturing drugs and medicines for human or animal use. As such, the data includes trade information on items other than medicines such as nutritional feed additives, vitamins and vitamin preparations.

## 3) Statistics Canada Summary Groupings - Medicinal and Pharmaceutical Products in Dosage

The trade data summary grouping "Medicinal and Pharmaceutical Products, in Dosage" published by Statistics Canada in catalogues 65-202 (Exports, Merchandise Trade) and 65-203 (Imports, Merchandise Trade) is a subset of trade data collected and tabulated as defined under Chapter 30 of the HS system (detailed above). Excluded from this grouping are non-medicinal items such as bandages, suture material and first-aid kits as well as medicines imported and exported in bulk. The following items from Chapter 30 of the HS commodity codes are included in the medicinal and pharmaceutical product in dosage summary grouping (codes 54010/exports and 59010/imports):

(Summary Grouping- continued)

All subcategories classified under 30.02

30.02 Human blood; animal blood prepared for therapeutic, prophylactic or diagnostic uses; antisera and other blood fractions and modified immunological products, whether or not obtained by means of biotechnological processes; vaccines, toxins, cultures of micro-organisms (excluding yeasts) and similar products.

All subcategories classified under 30.04

30.04 Medicaments (excluding goods of heading No. 30.02, 30.05 or 30.06) consisting of mixed or unmixed products for therapeutic or prophylactic uses, put up in measured doses or in forms or packings for retail sale.

Subcategory 3006.60 classified under 30.06

*3006.60 Contraceptive preparations based on hormones or spermicides*

Canadian Pharmaceutical Trade Data (thousands of dollars)									
Year	Domestic Shipments	Imports	Exports	Domestic Market	Balance Trade	of Export/Import Ratio	Exports as % of Domestic Shipments	Domestic Shipments as % of Domestic Market	Imports as % of Domestic Market
1981	1,327,416	238,809	85,070	1,481,155	(153,739)	0.36	6.4%	89.6%	16.1%
1982	1,457,757	267,581	103,095	1,622,243	(164,486)	0.39	7.1%	89.9%	16.5%
1983	1,661,985	327,497	121,722	1,867,760	(205,775)	0.37	7.3%	89.0%	17.5%
1984	1,839,823	377,903	120,147	2,097,579	(257,756)	0.32	6.5%	87.7%	18.0%
1985	2,229,814	359,477	120,910	2,468,381	(238,567)	0.34	5.4%	90.3%	14.6%
1986	2,489,344	447,101	144,682	2,791,763	(302,419)	0.32	5.8%	89.2%	16.0%
1987	2,931,876	504,787	164,540	3,272,123	(340,247)	0.33	5.6%	89.6%	15.4%
1988	3,180,422	557,222	128,196	3,609,448	(429,026)	0.23	4.0%	88.1%	15.4%
1989	3,257,349	588,492	146,064	3,699,777	(442,428)	0.25	4.5%	88.0%	15.9%
1990	3,581,976	709,946	181,863	4,110,059	(528,083)	0.26	5.1%	87.2%	17.3%
1991	3,796,938	859,123	183,223	4,472,838	(675,900)	0.21	4.8%	84.9%	19.2%
1992	4,146,954	1,192,703	261,028	5,078,629	(931,675)	0.22	6.3%	81.7%	23.5%
1993	4,543,987	1,461,765	318,638	5,687,114	(1,143,127)	0.22	7.0%	79.9%	25.7%
1994	4,451,277	1,672,232	445,303	5,678,206	(1,226,929)	0.27	10.0%	78.4%	29.5%
1995	4,427,687	1,853,359	555,382	5,725,664	(1,297,977)	0.30	12.5%	77.3%	32.4%
1996*	4,517,530	2,033,107	686,159	5,864,478	(1,346,948)	0.34	15.2%	77.0%	34.7%
Year-over-Year Increases (%)									
1982	9.8%	12.0%	21.2%	9.5%	7.0%				
1983	14.0%	22.4%	18.1%	15.1%	25.1%				
1984	10.7%	15.4%	(1.3)%	12.3%	25.3%				
1985	21.2%	(4.9)%	0.6%	17.7%	(7.4)%				
1986	11.6%	24.4%	19.7%	13.1%	26.8%				
1987	17.8%	12.9%	13.7%	17.2%	12.5%				
1988	8.5%	10.4%	(22.1)%	10.3%	26.1%				
1989	2.4%	5.6%	13.9%	2.5%	3.1%				
1990	10.0%	20.6%	24.5%	11.1%	19.4%				
1991	6.0%	21.0%	0.7%	8.8%	28.0%				
1992	9.2%	38.8%	42.5%	13.5%	37.8%				
1993	9.6%	22.6%	22.1%	12.0%	22.7%				
1994	(2.0)%	14.4%	39.8%	(0.2)%	7.3%				
1995	(0.5)%	10.8%	24.7%	0.8%	5.8%				
1996*	2.0%	9.7%	23.5%	2.4%	3.8%				

Source: Statistics Canada, Exports Merchandise Trade/Imports Merchandise Trade - by summary grouping (54010/59010) Medicinal & Pharmaceutical Products in Dosage.  
 \* 1996 figures are estimated based on January to October 1996 data

## Appendix 4

Effect of Exchange Rates on Value of Imports							
Year	Actual Imports	Adjusted to 1991 (1.1457)	Difference from actual		Adjusted to 1986 (1.3895)	Difference from actual	
1981	238,809	228,198	(10,611)	(4.4)%	276,747	37,938	15.9%
1982	267,581	248,419	(19,162)	(7.2)%	301,270	33,689	12.6%
1983	327,497	304,464	(23,033)	(7.0)%	369,238	41,741	12.7%
1984	377,903	334,394	(43,509)	(11.5)%	405,535	27,632	7.3%
1985	359,477	301,686	(57,791)	(16.1)%	365,869	6,392	1.8%
1986	447,101	368,668	(78,433)	(17.5)%	447,101	0	0.0%
1987	504,787	436,165	(68,622)	(13.6)%	528,958	24,171	4.8%
1988	557,222	518,748	(38,474)	(6.9)%	629,110	71,888	12.9%
1989	588,492	569,482	(19,010)	(3.2)%	690,637	102,145	17.4%
1990	709,946	697,139	(12,807)	(1.8)%	845,453	135,507	19.1%
1991	859,123	859,123	0	0.0%	1,041,898	182,775	21.3%
1992	1,192,703	1,130,541	(62,162)	(5.2)%	1,371,059	178,356	15.0%
1993	1,461,765	1,298,192	(163,573)	(11.2)%	1,574,378	112,613	7.7%
1994	1,672,232	1,402,912	(269,320)	(16.1)%	1,701,376	29,144	1.7%
1995	1,853,359	1,547,195	(306,164)	(16.5)%	1,876,356	22,997	1.2%
1996	2,033,107	1,708,358	(324,749)	(16.0)%	2,071,805	38,698	1.9%

## Appendix 5

<b>High Technology Trade Data, 1990 - 1994</b>					
(thousands of dollars)					
	<b>1990</b>	<b>1991</b>	<b>1992</b>	<b>1993</b>	<b>1994</b>
<b>Telecommunications Equipment*</b>					
Imports	2,011,665	2,062,273	2,376,624	2,753,898	3,275,490
Exports	2,047,680	1,951,528	2,435,819	2,898,483	3,796,210
Balance of Trade	36,015	(110,745)	59,195	144,585	520,720
Manufacturing Shipments	5,510,343	5,760,927	6,215,054	6,271,924	6,825,120
Import Penetration **	37%	36%	38%	44%	48%
<b>Electronic Computer &amp; Peripherals</b>					
Imports	5,224,331	5,879,324	6,785,206	7,839,459	9,593,537
Exports	2,821,063	3,256,564	3,842,354	4,293,010	5,973,678
Balance of Trade	(2,403,268)	(2,622,760)	(2,942,852)	(3,546,449)	(3,619,859)
Manufacturing Shipments	2,837,539	2,884,371	2,960,469	3,241,689	5,647,164
Import Penetration **	184%	204%	229%	242%	170%
<b>Pharmaceutical Products</b>					
Imports	709,946	589,123	1,192,703	1,461,765	1,672,232
Exports	181,863	183,223	261,028	318,638	445,303
Balance of Trade	(528,083)	(405,900)	(931,675)	(1,143,127)	(1,226,929)
Manufacturing Shipments	3,581,976	3,796,938	4,146,954	4,543,987	4,451,277
Import Penetration **	20%	16%	29%	32%	38%

Source: Statistics Canada

Note: \* Telecommunications equipment combined with other communications and electronic equipment.

\*\*Import Penetration: imports/manufacturing shipments