

NUMBER 54 • OCTOBER 1999

**ALBERTA: EVALUATING A DECADE'S EXPERIENCE WITH THE
CANADA-U.S. FREE TRADE AGREEMENT (FTA)**

*By Edward J. Chambers, Rolf Mirus, and Barry Scholnick
with S. Stephen Janzen and Nataliya L. Rylska*

*Western Centre for Economic Research
Faculty of Business, University of Alberta*

Canadian Cataloguing in Publication Data

Chambers, Edward J.

Alberta

(Information bulletin/University of Alberta. Western Centre for Economic Research ; no. 54)

Includes bibliographical references.

ISBN 1-55195-053-7

1. Alberta--Economic conditions--1945-1991.* 2. Alberta--

Economic conditions--1001-* 3. Free trade--Alberta. I. Mirus, Rolf.

II. Scholnick, Barry, 1964- III. Janzen, S. Stephen. IV. Rylska, Nataliya L. (Nataliya

Leonidivina), 1970- V. University of Alberta

Western Centre for Economic Research. VI. Title. VII. Series:

Information bulletin (University of Alberta. Western Centre for Economic Research) ; no. 54.

HC117.A4C52 1999 330.97123'03 C99-911172-8

TABLE OF CONTENTS

EXECUTIVE SUMMARY.....	1
Section 1: Highlights.....	1
Section II: Highlights.....	3
Section III: Highlights.....	4
Section IV: Highlights.....	5
Section V: Highlights.....	6
INTRODUCTION	7
The Public Policy Environment	7
The Path of the Alberta Economy 1988-1998.....	8
Making the Best of FTA Evaluation.....	9
SECTION I: THE FTA/NAFTA EXPERIENCE FROM 1988-1998: MERCHANDISE EXPORTS... 11	
Introduction.....	11
Aggregate Export Values.....	11
Greater Access to the U.S. Market.....	16
Western Canada's Top 20 Exports: Their Contribution to Export Growth.....	17
Alberta's Top Twenty Exports: Their Contribution To Export Growth.....	19
Distribution of Alberta Exports on the U.S. Market By State.....	21
<i>Distribution Pattern in The Energy Sector.....</i>	<i>21</i>
<i>Distribution Pattern By State in The Agricultural Sector.....</i>	<i>23</i>
<i>Distribution Pattern By State For The Rest of Categories.....</i>	<i>25</i>
Aggregate Price Change in Alberta Exports.....	27
Other Western Provinces.....	28
Alberta: Selected 1998 Export Highlights.....	32
<i>Energy and Plastics Export.....</i>	<i>32</i>
<i>Exports of Lumber , Pulp and Paper Products.....</i>	<i>33</i>
<i>Meat Products.....</i>	<i>35</i>
<i>Vegetable Products and Oilseeds.....</i>	<i>36</i>
<i>Electrical Equipment and Parts.....</i>	<i>38</i>
<i>Optical, Measuring and Precision Instruments.....</i>	<i>39</i>
Exports to Mexico.....	40
<i>Alberta Merchandise Exports to Mexico.....</i>	<i>42</i>

Exports to Chile.....	44
<i>Alberta Merchandise Exports to Chile</i>	45
Conclusion	47
SECTION II OVERVIEW OF THE ALBERTA MERCHANDISE (GOODS) EXPORT SECTOR....	48
Introduction.....	48
Overview of the Alberta Merchandise (Goods) Export Sector	49
The Export Record of Selected Goods Producing Sectors.....	51
Further Analysis of the Manufacturing Sector.....	53
Business Services	54
Average Weekly Earnings.....	56
Conclusion	57
SECTION III EMPLOYMENT VARIABILITY IN ALBERTA: IS THERE MORE STABILITY?.....	58
Background.....	58
Methodology.....	59
Results	61
Results with Fixed vs. Variable Sector Weights.....	64
Beta Measures of Volatility.....	65
Parsing the Changes in Alberta Employment Variance.....	67
Summary and Conclusions.....	69
SECTION IV INWARD FOREIGN DIRECT INVESTMENT SINCE THE FREE TRADE AGREEMENT: DATA AND IMPLICATIONS.....	71
Introduction.....	71
Data on Foreign Direct Investment in Canada (FDIC).....	72
Foreign Investment in Canada	73
Foreign Direct Investment By Province.....	76
Sectors of Importance to Alberta – CALURA Data	79
<i>Energy</i>	79
<i>Wood and Paper</i>	81
<i>Chemicals, Chemical Products and Textiles</i>	82
<i>Services (Excluding Consumer Services)</i>	82
<i>Machinery and Equipment</i>	82
<i>Electrical and Electronic Products</i>	82
Trade Liberalization and Foreign Direct Investment: Firm Level Evidence.....	83
Telephone Survey on FDI in Alberta.....	86
Conclusion	89

SECTION V: ASSESSING THE IMPACT OF TARIFF REDUCTIONS UNDER THE FTA ON ALBERTA HOUSEHOLDS.....	90
Household Expenditures	91
Imports and Tariff Schedules	92
A Model of Retail Pricing.....	93
Estimation of Household Savings Under the Above Conditions.....	95
Lower Bound Estimate.....	95
Upper Bound Estimate	97
Summary and ConclusionS.....	Error! Bookmark not defined.
SUMMARY AND CONCLUSIONS.....	99
APPENDIX 1(A).....	100
APPENDIX 1(B)	101
REFERENCES.....	102
INDEX OF TABLES.....	103
INDEX OF FIGURES	105

EXECUTIVE SUMMARY

There is now a decade of experience with the Canada-U.S. Free Trade Agreement (FTA), a time period of sufficient length to permit a broader assessment of the Agreement's impact on the Alberta economy. The approach in this Report for evaluation of the longer term provincial consequences of the FTA is to consider the record of a number of key variables directly related to the questions raised about economic performance.

SECTION 1

The first section of this Report considers the level of merchandise exports in 1998 in total and for two digit Harmonized System chapters benchmarked to the pre-FTA year of 1988. The exports of the other western provinces are also reported and comparisons drawn. In addition, this portion of the Report contains analyses of the disposition of three classes of exports—energy, agricultural, and non-energy/non-agricultural—to individual American states.

Highlights

- 1) Over the 1988-98 period Alberta merchandise exports to all foreign countries rose by \$17.727 billion, an increase of 136.3%. This growth was, by a substantial margin, the most sustained of the western provinces. Of this growth, \$16.347 billion resulted from increased sales to the U.S. market. Alberta's export performance on a per employee basis remained higher than the other western provinces. Each employed Albertan represented \$20,301 worth of exports. The western Canadian average was \$16,875.
- 2) Alberta's exports now account for 41.4% of total western Canadian exports compared to 33.3% in 1988.
- 3) The proportion of Alberta's top twenty merchandise exports destined for the U.S. rose from 70.1% to 84.1%. Notable increases have been recorded for the other provinces as well. In 1998, well over one-half of the value of the top twenty exports from each province went to the American market.
- 4) The evidence clearly points to the importance of U.S. market share access for numerous Alberta produced products. For the top twenty Alberta exports, U.S. market share groupings fall into the following three classes:
 - Those with initial and sustained high penetration of the U.S. market (greater than 90%). This group includes energy and livestock.

- A second, and by far the largest group, display a trend of rising U.S. market shares. This group includes the following categories: electrical equipment, processed meats, organic chemicals, plastics, fertilizers, furniture, cereals, inorganic chemicals, animal and vegetable fats and oils.
 - A third group displays either a neutral trend (sawn lumber, machinery and equipment and HS optical, photo equipment and measuring instruments) or a declining trend (woodpulp and base metals).
- 5) Analysis of energy exports to the U. S. indicate that in 1998 about one-half of the value of Alberta's exports went to Washington, Minnesota, Illinois and New York. Energy exports were more highly concentrated geographically in 1988 than in 1998. Over the period of the FTA there were increases in the share and absolute value of energy exports to numerous other states.
 - 6) Washington and Utah have consistently absorbed from 40-45% of the value of Alberta agricultural shipments to the U. S.
 - 7) California, New York and Texas are the most important geographic markets for exports of non-agricultural/ non-energy merchandise.
 - 8) In 1998 meat product exports from Alberta rose by close to 16% and for the first time the category's total value exceeded the billion-dollar mark to \$1.1 billion. The value of machinery and parts exports increased by a large margin in 1998, rising over 56% from its 1997 level. U.S. market share for these exports increased from 55% in 1988 to 63% in 1998. Exports of electrical equipment and parts (mostly telecommunications equipment) rose by 31% over 1997, sustaining the dramatic rise in their value since 1988. U.S. market share increased again in 1998 and now stands at 86%, a 21% increase since 1988.
 - 9) Alberta exports to Mexico rose by one quarter in 1998 largely due to increased electrical equipment and parts shipments. Mexico remains a small but growing market for Alberta merchandise exports.
 - 10) Alberta exports to Chile are small and have declined over the last two years. They do not reflect the investment of Alberta companies in that economy.

SECTION II

The second part of this Report considers the performance of shipments, employment and earnings from 1988 to 1998 in a number of significant tradable sectors of the Alberta economy, particularly in primary production and manufacturing. Consideration is also paid to the growth in the business services sector.

Highlights

- 1) The share of Gross Domestic Product (GDP) in goods producing industries displays a rising trend from 1988 to 1998. This contrasts with what occurred nationally, where during the same period, the goods producing sector relative to GDP displayed a declining linear time trend.
- 2) Foreign country markets as a share of expenditure based GDP rose quite consistently from one fifth (19.9%) in 1988 to one third (33.6%) in 1997. Export led growth was a major contributor to goods sector expansion and to the growth of the provincial economy. The dynamic element in the expansion of the merchandise export sector was the absolute and relative growth in shipments to the U. S. economy.
- 3) Though the export sector expanded sharply as business firms have taken advantage of the new market opportunities available under the FTA, the share of output going to other provinces and territories changed very little. This indicates that Alberta businesses maintained their customer relationships in other Canadian jurisdictions.
- 4) Within the goods producing sectors, a wide range of manufacturing industries experienced growth in the share of their output destined for foreign markets.
- 5) The export market – in most cases the U.S. market – has been significant in the performance of many of the manufacturing sectors recording the most rapid growth in the constant dollar value of shipments. These include electrical/communications equipment, paper and allied products, machinery, plastics, transportation equipment, organic chemicals and wood products
- 6) The data on international and inter-provincial shipments reveal that between 1988 and 1996 the business service industry in Alberta more than doubled its international share in total billings from 3.0% to 6.4%. During the same period, business services as a share of total employment in firms of all sizes rose from 3.9% to 6.9% of total employment and increased further to 8.0% in 1998.

- 7) In virtually all goods producing sectors, including both the durable and nondurable manufacturing groups as a whole, as well as in business services, the trend rate of growth in the average weekly earnings of all employees in firms of all sizes earnings exceeded the rate of inflation.
- 8) The finding from linking Harmonised System trade data to Standard Industrial Classification of firms is that the FTA has had a positive effect on those sectors of the Alberta economy most directly involved in trade flows. By any standard one applies, the Alberta economy has become more tied into the international economy during the FTA era, and relatively unfettered access to the American market has been central to the transitions that have taken place.

SECTION III

Employment, as a primary determinant of economic welfare and social status is arguably the single most important economic policy variable. This section of the Report examines whether the FTA era has been associated with a change in the degree of employment stability (the extent of ups and down in employment) in Alberta. The data used to consider whether employment stability in Alberta has changed from the era previous to the FTA are from the monthly labour force survey of Statistics Canada and covers the period from the first quarter of 1976 (1976:Q1) to the second quarter of 1998 (1998:Q2). Two periods are considered: the first from 1976:Q1 to 1987:Q4 and the second from 1988:Q1 to 1998:Q2. A portfolio variance model is applied to test for changes in employment stability.

Highlights

In Alberta, employment variability in both the goods and service sectors declined in the FTA period. In the goods sector, employment variability fell by one-half and in the service sector it fell by some 30%. In the first period, variance in the goods sector accounted for just under 60% of total variability, while in the second, the goods and service sectors contributed in almost equal shares to the substantially lower levels of variability

Alberta's employment variability was considerably above that of the national economy in both eras, but the difference lessened in the FTA era.

The Free Trade Agreement created a new range of market opportunities for Alberta enterprises. Certainly—absent all else—it facilitated diversification within the energy industry by guaranteeing U.S. market access for natural gas producers. But the FTA did more than this. It also presented to businesses in many sectors a relatively benign

environment for acquiring knowledge and experience as exporters—even for an initial venture into exporting. It is clear that many members of the Alberta business community took good advantage of this extraordinarily significant change in trade policy.

SECTION IV

This section examines the impact of Foreign Direct Investment (FDI) provincially, and in Alberta in particular. However, provincial FDI data is very scarce. Regardless, this section provides as much evidence as possible from available data.

Highlights

- 1) A comparison of FDI levels with the labour force in each province reveals that of the four larger provinces, Alberta and Ontario both attract a higher proportion of FDI than their proportion of the Canadian labour force. On the other hand both Quebec and British Columbia attract proportionally less FDI than their share of the labour force would suggest. There may be many explanations for these differences, but in general the data provide support for the view that FDI tends to be attracted to jurisdictions which are perceived as being conducive to conducting business.
- 2) Two findings summarize the research on FDI in Canada in the wake of the trade liberalization between 1983 and 1992, a period during which average tariffs dropped from nearly 8% to 3% in Canada and from 4% to less than 1.5% in the U.S.
 - a) For 50 manufacturing industries and 701 Canadian business affiliates there was a statistically secure relationship between tariff-reduction in Canada and employment or capital investment. This relationship, after controlling for other factors, associated lower tariffs with more employment and asset deployment.
 - b) There were a few - surprisingly few - cases where at the level of the firm, employment and assets were reduced as tariffs in Canada declined. At the industry level this was not the case for a single one of the 50 industries represented in the sample. This implies that government policies shielding particular industries from the effects of trade liberalization may be misguided. It also means that one can expect opponents of trade liberalization to ignore the overall evidence of higher U.S. FDI in Canadian affiliates and point to the few exceptions at the level of a few individual firms.
- 3) Even with the introduction of the FTA, foreign direct investment into the energy sector is less than would have been anticipated a decade ago. The lower profitability for foreign controlled firms as compared with domestic firms in the energy sector could be

one reason for the fact that there has not been a significant increase in FDI into the energy sector in Canada. The question of why Canadian energy firms tend to be more profitable relative to assets than foreign energy firms is one that clearly requires further research.

- 4) The key conclusion that can be drawn from this section is that the concerns over Foreign Direct Investment that were expressed at the time of the Free Trade negotiations, have on the whole, proved to be unfounded. Foreign Direct Investment has been beneficial for both Canada and Alberta. An important policy issue that remains, however, is to ensure that suitable regulations are in place to encourage world wide flows in FDI. While North American Free Trade Agreement (NAFTA) provides a very valuable template for an international agreement on investment, it has not been possible to extend such an agreement into all of the World Trade Organization (WTO) countries. The evidence provided here on the impact of FDI on Canada and Alberta since the FTA and NAFTA indicate that there would be many benefits to both Canada and Alberta if an international agreement on investment could be negotiated.

SECTION V

This section estimates the effects on Alberta household incomes resulting from the elimination of tariffs under the FTA.

Highlights

- 1) An estimate of the benefits to households from tariff reduction under the FTA requires the reconciliation of a number of data sources including household expenditures, imports, WTO tariff schedules for Canada, and the schedule for phasing out tariffs under the FTA. The classifications found in these data sets possess some degree of overlap but they are far from congruent.
- 2) The measure reported here of the benefits received by households under the FTA are limited to goods expenditures as itemised in the Statistics Canada 1996 survey of household expenditures exclusive of alcohol and tobacco.
- 3) Alberta household expenditures from the phased elimination of tariffs under the FTA ranged from a lower bound of \$2,240 million to an upper bound of \$3,401 million in \$1998 over the decade 1989-98.
 - b) Based upon the number of Alberta households in 1998, these savings reduce to benefits per household within the range of \$2100 to \$3200 over the 1989-98 decade.

INTRODUCTION

There is now a decade of experience with the Canada-U.S. Free Trade Agreement (FTA), a time period of sufficient length to permit a broader assessment of the Agreement's impact on the Alberta economy. We know that over this decade of Alberta's international export sector increased in size and in relative importance. Goods exports to foreign countries as a share of provincial Gross Domestic Product rose from a quarter in 1988 to one third in 1998. This absolute and relative growth in the export sector coincided with the rise in the importance of shipments to the American market. In 1988 these shipments amounted to just under 70% of international merchandise exports, while in 1998 this share had increased to 82%.

Yet, for many in Alberta, the FTA remains a subject of debate. Questions abound—What was the effect of the FTA on the aggregate economy and its major components? What were the effects on particular sectors? Did international exports simply take the place of inter-provincial exports? How was employment affected? What has happened to earnings? Since the FTA covered both goods and services, have exports of business services increased? What were the effects on foreign direct investment? What savings accrued to households from tariff elimination?

THE PUBLIC POLICY ENVIRONMENT

Assessment of the provincial impact of the FTA must pay due regard to the policy stance adopted by the provincial government. Because, constitutionally, provincial governments possess substantial economic responsibilities, positions on trade policy can shape private sector attitudes and plans. These governments significantly influence the environment within which private sector decisions are taken. The evidence clearly shows that across the Canadian federation there has been wide variation in the trade policy stances of provincial governments. Some were indifferent to the FTA, others were highly skeptical, and some were opposed. The position of the Alberta Government toward the FTA clearly stands out. It was extremely supportive of the free trade arrangement, not only after the Treaty was signed, but equally important during the initial stages of public discussion and policy formation. Alberta favoured free trade with the United States and government representatives argued strongly for the Agreement. The fact that the open trade orientation of the provincial government was in place, and strongly espoused, long before the Agreement was signed provided the basis for discussion with the business community about a prospective agreement and its potential benefits. The private sector was encouraged

and given every opportunity to consider and assess the market opportunities that an agreement would offer.

THE PATH OF THE ALBERTA ECONOMY 1988-1998

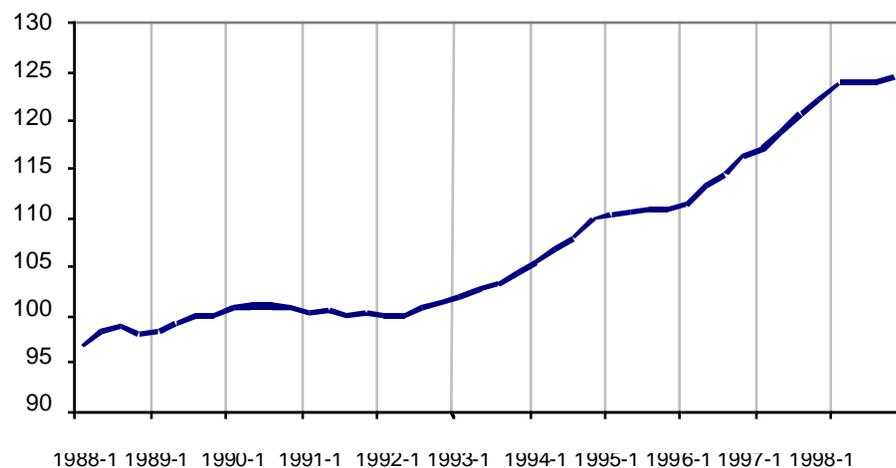
It is desirable to have some understanding of how the provincial economy performed at the macro level during the 1988-1998 period.

The quarterly path of the Alberta economy over the 1988 to 1998 period, as measured by the Western Center's coincident indicator of business activity, is shown in Figure 1. The coincident indicator is composed of three measures:

- average hours worked per week for hourly rated workers in all economic sectors (a measure of the intensity of employee utilization);
- full time employment (a measure of the strength of the job market);
- retail sales adjusted for the rate of inflation (a measure of consumer confidence and spending power).

The economy expanded during 1988 and 1989 but was adversely affected by the North American recession commencing in 1990 and lasting through 1991. The effects of this recession continued to impact the Alberta economy in 1991 and 1992. Recovery in Alberta commenced in early 1993 when the economy embarked on a path of sustained growth moderated in 1995 and again in 1998. In general, the strong growth path that commenced in early 1993 dominated the performance of the aggregate economy.

**Figure 0.1. WCER index of quarterly business activity for Alberta
1988:Q1 to 1998:Q4 (1992:Q1=100)**



MAKING THE BEST OF FTA EVALUATION

A complete evaluation of the FTA's impact on Alberta is a far from simple exercise. To know the effects of the FTA requires 'knowledge' (a model) of what the Alberta economy would have been like in the absence of a FTA. We cannot attribute observed changes in the provincial economy over the past decade exclusively to the FTA. For example, it is highly likely that growth would have been recorded not only in the aggregate economy, but also in exports even without the FTA. Further, shipments to the U. S. economy, despite continued tariff levels and less than unfettered access, could well have accounted for an increased share of international shipments. The impact of the FTA should be measured by the difference between the economy as we observe it now and the most probable state of the economy absent the FTA. Essentially, a strictly correct measure of the impact of the FTA requires a weighing of a factual condition against a hypothetical one.

Constructing a hypothetical model to assess the impacts of the FTA on the provincial economy would be both extremely difficult and highly controversial. A simplistic model, for example, would probably examine the increment in goods exports that followed from tariff elimination coupled with the response of the service sectors and direct investment to new cross border incentives. This simplistic approach ignores probable private sector and public policy responses in the hypothetical situation. In sum, many hypothetical scenarios are possible and the conclusion is, regrettably, that there is no generally accepted hypothetical model of the Alberta economy applicable to the last decade.

This Report takes an alternative approach to evaluating the longer term consequences of the FTA on the province. It examines a number of key variables directly related to the questions about economic performance. The first section of this Report considers the level of merchandise exports in 1998 in total and for various two digit HS chapters, benchmarked to the pre-FTA year of 1988. Exports from other western provinces are also reported and comparisons drawn. This section also contains analyses of the disposition of three classes of exports—energy, agricultural, and non-energy/non-agricultural—to individual American states. The second section considers the performance of employment and earnings in a number of significant tradable sectors, particularly in primary production and manufacturing, in the period from 1988 to 1998. Some attention is also paid to the growth in, and market shares of, those sectors of the economy that produce business services. The importance of export opportunities to developments in these sectors is assessed. The third section of the Report addresses the question of employment stability in Alberta. A generally recognized methodology is applied to employment from 1976 to 1987 and from 1988 to 1998 to determine if there have been any discernible changes in volatility between the two periods. The

fourth section of the Report considers estimated inflows of foreign direct investment and the sectors in Alberta that have benefited. The fifth section of the Report makes some tentative estimates of the savings accruing to Alberta households following from tariff elimination under the FTA.

Precise, unambiguous conclusions are not always possible. For example, in Section II, it will be necessary to use two different sets of data classification—the Harmonised System (HS) for international trade data and the Standard Industrial Classification (SIC) system for data related to the respective sectors of the provincial economy. There is imperfect overlap between these two systems and that imperfection will be a caveat to the conclusions that are drawn. Similarly, in Section IV, there is no available data on inflows of foreign direct investment at the provincial level. Accordingly, it has been necessary to massage national data by heuristic methods to determine how Alberta fared as a recipient of these inflows.

SECTION I: THE FTA/NAFTA EXPERIENCE FROM 1988-1998: MERCHANDISE EXPORTS

INTRODUCTION

Section I of this Report is, in fact the most recent in an annual series on Western Canada and the recent free trade agreements, both the Free Trade Agreement (FTA) and the North American Free Trade Agreement (NAFTA). The annual series reviews the merchandise exports of Alberta and other western Canadian provinces in the years since the FTA came into effect in 1989. As in the case of previous reports, the year 1988 has been employed as a benchmark against which to assess growth in aggregate exports as well as in some 98 categories of shipments from the western provinces to the United States and to other parts of the world. The shipment data is organized by the Harmonised System (HS), an internationally used method of classifying merchandise exports and imports. This section summarizes the experience of the last year and draws some comparisons respecting provincial export performance since 1988. In addition, there are updates of the top twenty exports (1998 ranking) for Alberta and the three other western provinces. U.S. market shares over the 1988-1998 period are also reported. Brief examinations of the performance of selected Alberta exports are also provided. The report contains an overview of merchandise exports to Mexico and Chile. In addition, this segment contains analyses of Alberta exports to the American states for the categories of energy, agricultural and non-agricultural/non-energy HS classes. This Report uses the 1998 fourth quarter Statistics Canada CTA data and includes re-exports.

Declines in selected commodity prices had a significant influence on the total value of exports from Alberta in 1998. Lower prices, particularly for crude oil, were primarily responsible for the 7.8% fall in the 1998 value of Alberta merchandise exports to \$30.736 billion. Detailed estimates of the effects of price and volume changes on export shipments in selected HS categories (classification of goods according to Harmonized System) are contained in relevant sections of this part of the Report.

AGGREGATE EXPORT VALUES

Tables 1.1 and 1.2 (below) contain data of the value of Alberta and other Western Canadian merchandise exports. Table 1.1 shows that aggregate merchandise exports from Western Canada fell slightly from 1997 levels to \$74.319 billion in 1998. The decrease in 1998 over 1997 for Western Canada as a whole was \$2.4 billion, or 3.1%. This compares

with the annual increase in 1997 over 1996 of \$5.83 billion or 8.3%. Compared to 1988 exports of \$39.079 billion, 1998 export values increased by some 90%.

Alberta's export values increased by 136.3% compared to 1988 but decreased 7.8% from 1997 levels. Table 1.1 reveals that in 1998 Alberta shipments of \$30.730 billion were \$4.06 billion higher than British Columbia's \$26.676 billion. Alberta's share of total Western Canadian exports has been rising steadily since 1988 and only recently has shown signs of leveling-off at just over two fifths of the region's total. Effectively, for every \$100 shipped to foreign countries from Western Canada, \$41.356 originated in the province of Alberta. In terms of total exports, Saskatchewan and Manitoba rank third and fourth after British Columbia.

Table 1.1. Dollar value of merchandise exports:* Western Canada and the four provinces, 1988-1998 (\$ billions)

Year	Alberta	B. C.	Sask.	Manitoba	W. Canada
1988	13.009	17.419	5.760	2.909	39.097
1989	13.490	17.802	4.490	2.929	38.711
1990	15.191	16.650	5.401	2.969	40.211
1991	16.029	15.300	5.691	3.079	40.099
1992	17.884	16.358	6.586	3.430	44.258
1993	19.688	18.996	5.981	3.435	48.100
1994	23.008	22.812	7.442	4.730	57.992
1995	26.543	26.934	8.778	5.439	67.694
1996	30.783	25.197	8.908	5.986	70.874
1997	33.330	26.566	9.804	7.008	76.708
1998	30.736	26.676	9.104	7.802	74.319

Source: TIERS, CTA and the Western Centre for Economic Research

Figure 1.1 contains a chart of annual provincial exports converted to an index basis in order to allow an easy comparison of export growth rates. Merchandise export values in 1988 are set at 100 for each province. The Alberta index in 1998 stood at 236.5, higher by a substantial margin than the index values for Saskatchewan (158.1), British Columbia (152.7) but lower than Manitoba (268.2) for the first time since 1988. Until 1998, the annual index for Alberta has exceeded those of other provinces throughout the entire period (see Figure 1.2).

* exports represent aggregated export values

Figure 1.1. 1998 Index of the value of annual provincial exports (1988=100)

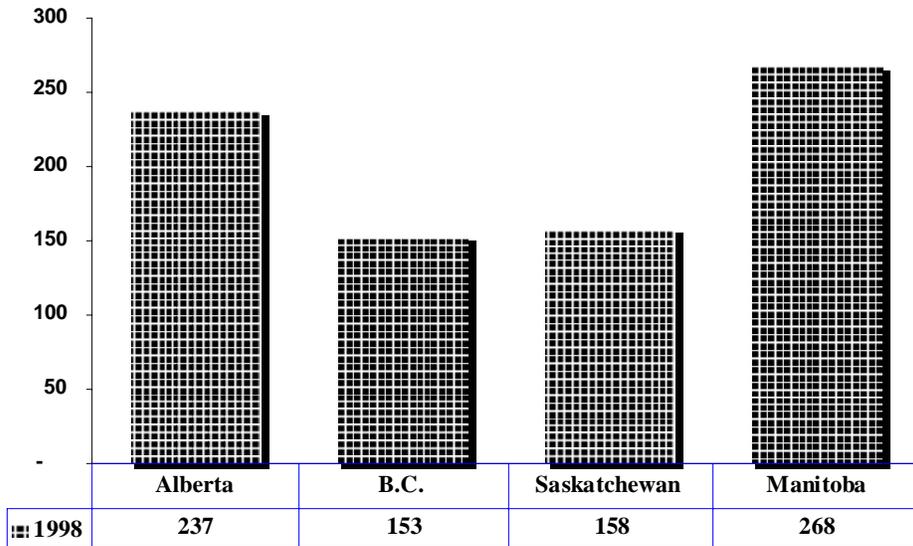


Figure 1.2. Index of the value of exports by province, 1988-1998 (1988 = 100)

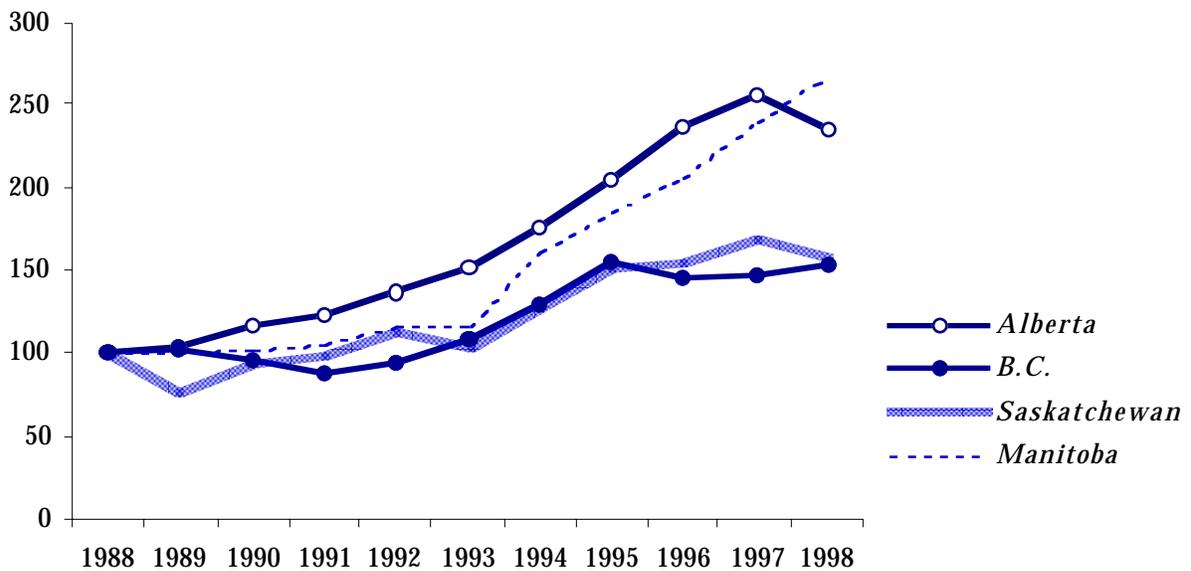


Table 1.2. Comparison of total exports from the provinces and shares to the U.S. Market in 1988, 1997, and 1998 (\$ millions)

Province	'88 Total Exports	'97 Total Exports	'98 Total Exports	Growth 1988-98	'88 U.S. Market Share %	'97 U.S. Market Share %	'98 U.S. Market Share %
AB	13.009	33.330	30.736	17.727	69.5	81.0	82.6
AB Excluding Cereals [HS 10]	11.758	31.650	29.715	17.957	76.4	81.4	84.7
BC	17.419	26.566	26.676	9.257	42.7	54.8	63.6
BC Excluding Cereals [HS 10]	17.384	26.521	26.651	9.267	42.7	51.9	63.7
MB	2.909	7.008	7.802	4.893	58.1	76.3	78.6
MB Excluding Cereals [HS 10]	2.250	6.235	7.320	5.070	74.3	82.9	81.9
SK	5.760	9.804	9.104	3.344	33.8	55.5	59.6
SK Excluding Cereals [HS 10]	2.890	7.073	7.203	4.313	65.3	70.1	70.0
Total West	39.097	76.708	74.319	35.222	51.4	67.3	72.5
All Excluding Cereals [HS 10]	34.282	71.479	70.889	36.607	52.6	70.9	75.0

Source: TIERS, CTA and the Western Centre for Economic Research

The aggregate share of merchandise exports flowing from Western Canada to the U.S. climbed strongly, from 67.3% in 1997 to 72.5% in 1998. Table 1.2 (above) provides a comparison of total exports from the provinces to the U.S. Totals are also shown for exports excluding grains, a volatile, supply driven category particularly significant to the three prairie provinces. Excluding grains, aggregate Alberta exports increased by almost \$18.0 billion, or 153%, over 1988 levels. The decrease (excluding grains) compared with 1997 was 6.1%. Exports from Alberta, excluding grains, as a share of Western Canadian exports were 41.9% in 1998 compared with 34.3% in 1988. This growth in Alberta's share of the region's exports can be attributed to a number of factors, including the success of Alberta business in accessing the American market and the economic turbulence in Pacific Rim countries which contributed to the slackening demand for British Columbia exports.

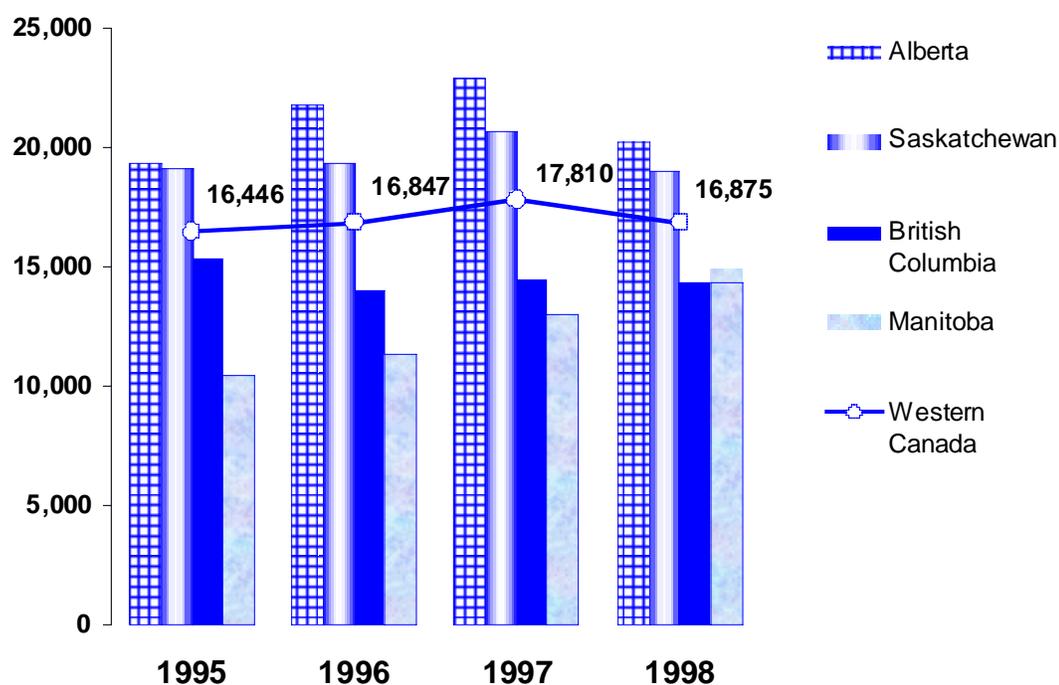
Another way of looking at Western Canada's export performance is provided in Table 1.3 and Figure 1.3. Here we measure the export intensity by province on a per employed person basis from 1995 to 1998. By this measure Alberta, with international exports valued at \$20,301 per employed person, is first among the western provinces, followed closely by Saskatchewan. Manitoba continues to show strong and steady year over year growth with exports per employed person in 1998 about equal to those of British Columbia.

Table 1.3. Western Canadian export performance based on the value of merchandise exports per employee 1995-1998 (\$ dollars)

Province	1995	1996	1997	1998
Alberta	19,332	21,786	22,875	20,301
British Columbia	15,286	13,951	14,454	14,297
Manitoba	10,439	11,380	13,026	14,289
Saskatchewan	19,082	19,323	20,684	19,006
Western Canada	16,446	16,847	17,810	16,875

Source: Statistics Canada, TIERS, CTA and Employment < Earnings and Hours, and the Western Centre for Economic Research

Figure 1.3. Western Canadian export performance on a \$ per employee basis, 1995-1998

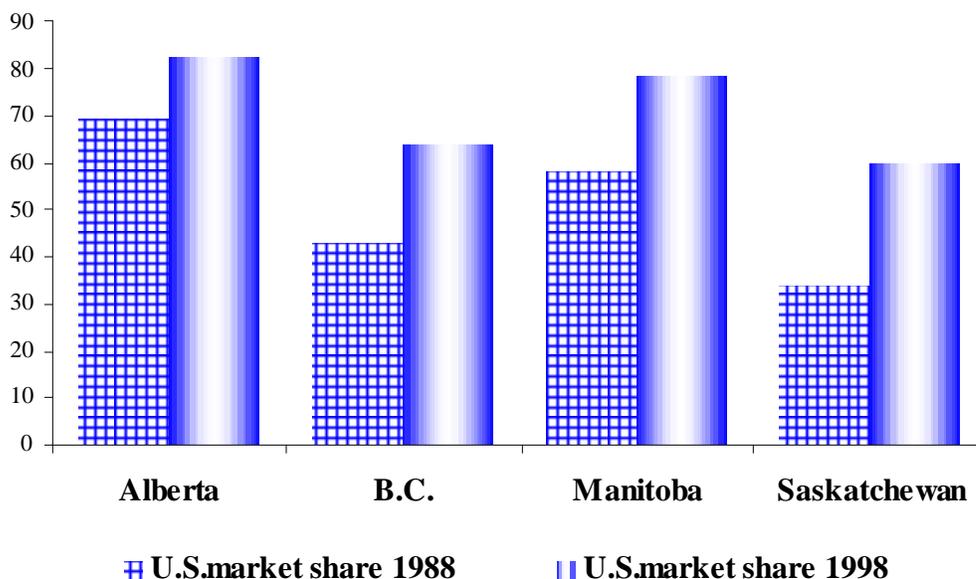


Source: TIERS, CTA and the Western Centre for Economic Research

GREATER ACCESS TO THE U.S. MARKET

Figure 1.4 summarizes market shares for the top twenty exports from each province. The increased importance of the U.S. market resulting from improved access under the free trade agreements is readily apparent. The U.S. as a destination for Alberta's top twenty exports rose from 69.5% in 1988 to 82.6%. Notable increases have been recorded for the other provinces as well, so that, in 1998, well over one-half of the value of the top twenty exports from each province went to the American market.¹

Figure 1.4. U. S. market share for exports of the four Western Canadian provinces, 1988 and 1998, %



¹ A small portion of the increased U.S. market share is probably a result of transshipment to third markets - most notably Mexico - using American facilities.

**WESTERN CANADA'S TOP 20 EXPORTS:
THEIR CONTRIBUTION TO EXPORT GROWTH**

Total Western Canadian exports continue to be dominated by the energy, forestry and agricultural industries, as shown below in Table 1.4. The table and Figure 1.5 show the contribution of the top 20 merchandise exports in western Canada ordered by 1998 HS value at the two digit level together with their share of regional exports in 1998, their contribution to the growth in export values between 1988 and 1998, and their U.S. market shares.

Table 1.4 reveals that 57.1% of the total value of western Canadian merchandise exports in 1998 were accounted for by the top five export categories measured at the HS two digit level, and a further 29.6% were accounted for by the next fifteen. For the region, all other HS two digit groups made up the remaining 13.3% of 1998 exports. The top twenty exports in 1998, as revealed in Figure 1.5, accounted for 86.3% of the total export growth between 1988 and 1998. The top five exports—energy, sawn lumber, wood pulp, cereals and paper—accounted for some 50.0% of the ten year growth with energy alone making up one third of the total.

Figure 1.5. Percentage contribution of Western Canada's top 20 categories to export growth in 1998

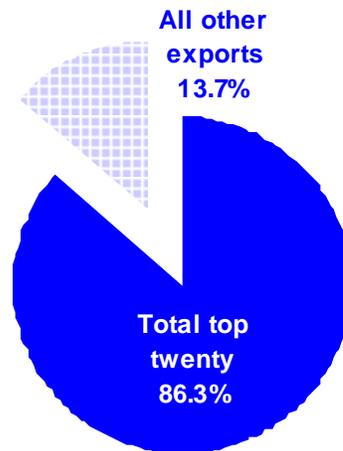


Table 1.4. Western Canada's top twenty exports and their share in export growth (\$ millions)

HS CATEGORY	1998 Export	As % of	1988	Export	%	US Share	
	Value	98 Total	Export	Growth	Growth	1988	1998
			Value		Share		
27) Mineral fuels, oils	21,674	29.2	9,865	11,809	33.5	80.1	89.4
44) Sawn lumber	10,029	13.5	5,244	4,785	13.6	59.3	77.6
47) Woodpulp	4,241	5.7	3,954	287	0.8	3.2	30.5
10) Cereals	3,430	4.6	4,790	-1,360	-3.9	31.8	21.3
84) Machinery, boilers, appliances	3,062	4.1	963	2,099	6.0	77.3	77.5
85) Electrical Equipment	2,781	3.7	277	2,504	7.1	75.7	83.2
48) Paper & paperboard	2,713	3.7	1,673	1,040	3.0	68.5	77.5
31) Fertilisers	2,456	3.3	1,429	1,027	2.9	55.4	68.3
12) Oil seeds, misc. grains	1,994	2.7	942	1,052	3.0	9.8	19.4
87) Vehicles, parts	1,925	2.6	515	1,410	4.0	87.4	90.6
01) Live animals	1,488	2.0	448	1,040	3.0	98.9	99.8
02) Meat and edible meat offal	1,441	1.9	324	1,117	3.2	75.9	76.6
29) Organic chemicals	1,265	1.7	1,062	203	0.6	44.4	61.4
39) Plastics	1,205	1.6	727	478	1.4	65.4	83
94) Furniture; bedding	874	1.2	123	751	2.1	81.5	86.5
90) Optical & photo equipment	846	1.1	86	760	2.2	56.3	75.6
15) Animal/veg fats & oils	825	1.1	233	592	1.7	36.2	52.4
03) Fish	780	1.0	624	156	0.4	27.3	62.2
76) Aluminum and articles thereof	740	1.0	629	111	0.3	18.4	38.9
07) Edible vegetables, certain roots	686	0.9	139	547	1.6	15.2	28.3
Total top twenty	64,455	86.6	34,047				
Growth top twenty				30,408	86.3		
U.S. Share top twenty						45.0	72.8
All other exports	9,864	13.4	5,050				
Growth of all other exports				4,814	13.7		
U.S. share of all other exports							
Total exports	74,319	100.0	39,097				
Total export growth				35,222	100.0		
U.S. share of total export growth						51.4	72.5

Source: TIERS, CTA and the Western Centre for Economic Research

**ALBERTA'S TOP TWENTY EXPORTS:
THEIR CONTRIBUTION TO EXPORT GROWTH**

Table 1.5 shows Alberta's top twenty exports ordered by 1998 export value, together with their export value in 1988 and their growth over the decade. In 1998 Alberta's top five export categories accounted for 69% of the value of its total exports and the next fifteen for another 25.2%. All other HS categories amounted to 5.7% of Alberta's total export value. Apart from the continued dominance of energy products (crude oil, natural gas and coal), the most notable feature of the Alberta's exports is the increasing importance of HS 85, electrical equipment—specifically communications equipment and parts— which has climbed to second place in terms of value. Cereals (HS 10) and organic chemicals (HS 29) dropped out of the top five ranked categories and were replaced by meats (HS 2) and wood pulp (HS 47).

Fifteen of Alberta's top 20 exports saw their U. S. market share increase over the 1988 to 1998 period. The more important categories in terms of export value have benefited markedly from the greater access to the U.S. With the exception of lumber (HS 44) and wood pulp (HS 47), the U.S. market share for Alberta's top five exports has increased substantially.

For the top group of Alberta exports as reported in Table 1.5, trends in U. S. market can be grouped as follows:

- Those with initially high penetration of the U.S. market (greater than 90%) that was sustained and increased. This group includes HS 27 and HS 01.
- A second, and by far the largest group, display a trend of rising U.S. market share. This group includes the following categories: HS 85, HS 02, HS 29, HS 39, HS 31, HS 94, HS 10, HS 28, HS 15, HS 12 and HS 25.
- A third group displaying either a neutral (HS 44, HS 84 and HS 90) or a declining trend (HS 47 and HS 81).

The evidence emphasizes the importance of U. S. market access for Alberta exporters.

Table 1.5. Alberta's top twenty exports and their share in export growth (\$ millions)

HS CATEGORY	1998 Export Total	As % of 98 Total	1988 Export Value	Export Growth	% Growth Share	US Share	
						1988	1998
27) Mineral fuels, oils, distillates	16,198	52.7	6,874	9,324	52.6	93.0	96.6
85) electrical equipment	1,575	5.1	113	1,462	8.2	64.9	86.4
47) Woodpulp	1,194	3.9	385	809	4.6	94.9	44.8
44) Sawn lumber	1,159	3.8	229	930	5.2	92.4	92.3
2) Meat and edible meat offal	1,093	3.6	159	935	5.3	67.9	82.8
84) Machinery, boilers, appliances	1,070	3.5	172	898	5.1	54.6	62.6
10) Cereals	1,021	3.3	1,251	-229	-1.3	4.8	20.3
29) Organic chemicals	978	3.2	892	85	0.5	45.1	71.5
1) Live Animals	797	2.6	282	516	2.9	98.4	99.9
39) Plastics	711	2.3	622	90	0.5	61.8	74.2
12) Oil seeds, misc. grains	589	1.9	296	293	1.7	8.8	18.5
99) Special transaction-trade	442	1.4	37	405	2.3	44.7	77.1
31) Fertilizers	391	1.3	196	195	1.1	62.2	99.8
94) Furniture, bedding	338	1.1	33	305	1.7	83.3	92.6
25) Salt; sulphur; earth and stone; plaster	304	1.0	803	-499	-2.8	13.2	28.1
28) Inorganic chemicals	238	0.8	94	144	0.8	89.2	85.4
90) Optical, photo equip., instruments	225	0.7	34	191	1.1	40.5	49.5
48) Paper & paperboard	222	0.7	8	214	1.2	96.9	99.8
81) Other base metals articles thereof	213	0.7	7	207	1.2	17.8	5.5
15) Animal/vegetable fats & oils	203	0.7	6	197	1.1	44.2	66.8
Total top twenty	28,961	94.3	12,493				
Growth top twenty				16,468	92.9		
U.S. share of top twenty						70.1	84.1
All other exports	1,775	5.7	516				
Growth of all other exports				1,259	7.1		
U.S. share of all other exports						29.9	15.9
Total exports	30,736	100.0	13,009				
Total export growth				17,727	100.0		
U.S. share of total export growth						69.5	82.6

Source: TIERS, CTA and the Western Centre for Economic Research

DISTRIBUTION OF ALBERTA EXPORTS ON THE U.S. MARKET BY STATE

Another analysis was conducted in order to examine the distribution of export flows from Alberta to various U. S. states and to evaluate their stability over the 1988-1998 period. Distribution of export flows by state is considered for three significant blocks of exports: energy (HS 27), agriculture (here including HS 01, HS 10, HS 12) and all remaining categories. Energy and agriculture, traditionally strong Alberta export sectors, were separated from other categories so that any growth in alternate exports could be more easily identified. Patterns of state distribution were examined according to the following criteria:

- the dispersion/concentration of export flows to each state for the specified export categories during 1988-1998;
- the level of stability of the resulting distribution profiles as determined by the consistency of state rankings from year to year.

Distribution Pattern in The Energy Sector

Figure 1.6 reports the level of concentration of Alberta's energy (HS 27) shipments to the U.S. in 1998. The pattern of distribution for HS27 falls into three groups:

- A zone of strong concentration (export values of \$2.0-3.5 billion), comprising the states of Washington, Minnesota, Illinois and New York;
- A zone of moderate concentration (export values of \$0.1-2.0 billion), comprising Montana, Indiana, Michigan, Tennessee, Ohio, Iowa, Wisconsin, Texas, Vermont, California, Oregon and North Dakota;
- A zone of dispersion (export values below \$0.1 billion), comprising the remaining 35 states.

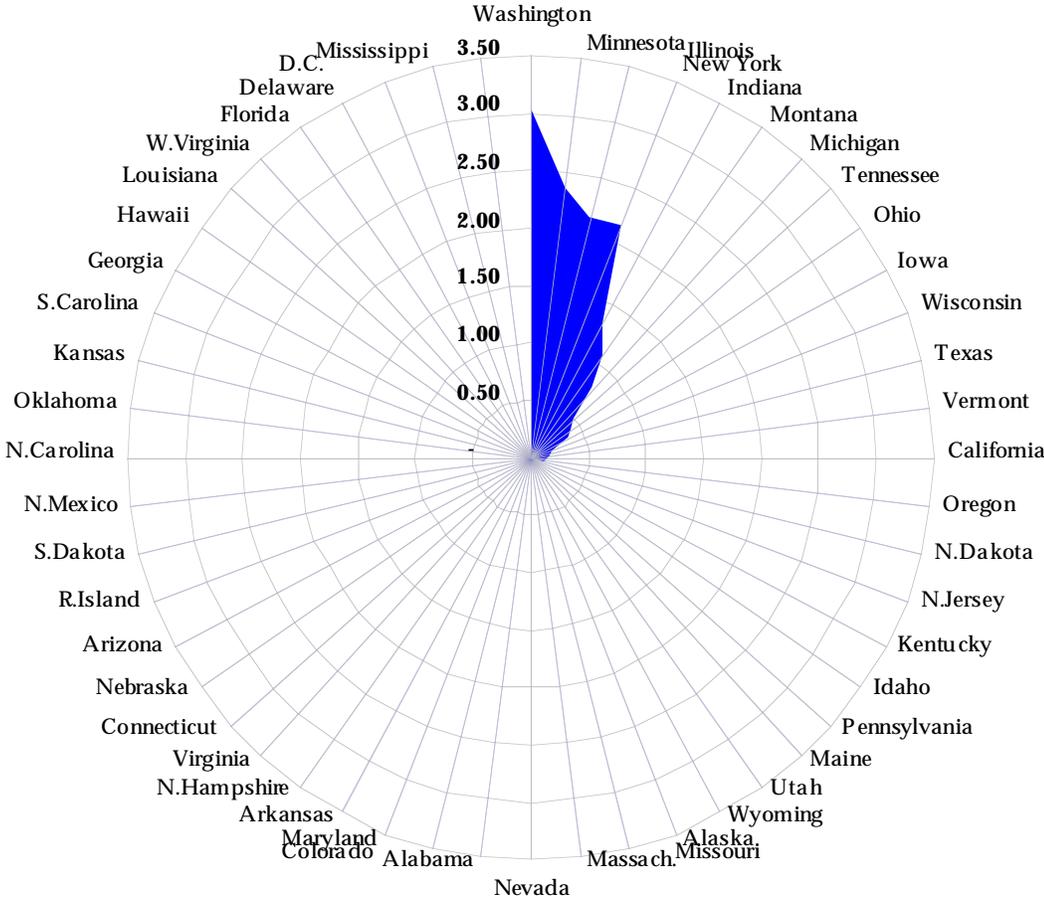
Comparison of the 1998 distribution profile with 1988 data reveals the following trends:

- In 1998 the zone of strong concentration includes fewer states than in 1988 and its share of total Alberta shipments has decreased from 83% in 1988 to 48%. At the same time the volumes of trade per state more than doubled during 1988-1998;
- The zone of moderate concentration expanded from eight to twelve states, indicating that export relations have been successfully established in those states and that exports had begun to grow. This zone's share of total exports increased significantly, from 17% in 1988 to 35% in 1998, and export volumes increased five-fold.
- The dispersion zone included fewer states in 1998, but the value of exports to this group does not vary significantly from \$46-\$50 million.

The test for the stability of this pattern using Spearman's rank correlation methods suggests the following:

- relatively stable destination patterns over the entire period;
- increasing stability in state destination patterns over time.

Figure 1.6. Distribution of Alberta exports to U.S. by state in energy sector in 1998, (\$ billions)



Source: TIERS, CTA and the Western Centre for Economic Research

Distribution Pattern By State in The Agricultural Sector

Figure 1.7 indicates the degree of concentration of Alberta's agricultural exports - live animals, oilseeds and cereals (HS 01, HS10, HS 12) in the U.S. market in 1998. During the 1988-1998 period agricultural shipments tripled to the U.S. market. Their distribution pattern shows high concentration in a few states, with some geographic expansion. Three major areas of concentration can be identified:

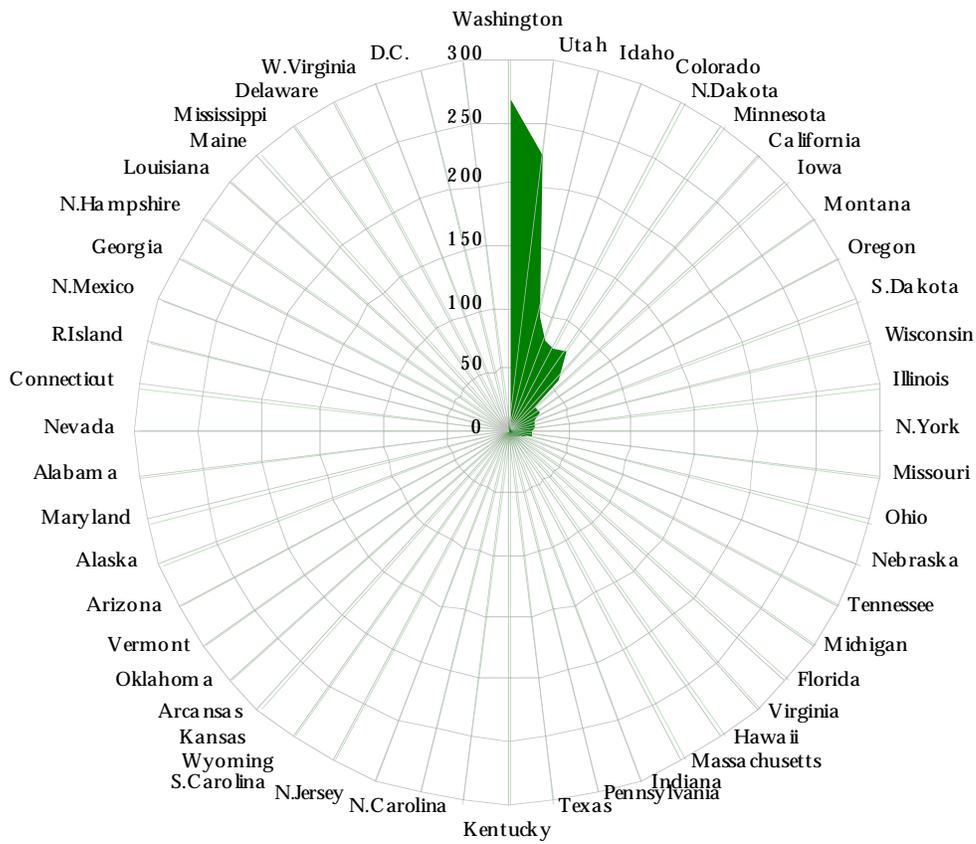
- A zone of strong concentration (export values of \$100-\$270 million) comprising Washington and Utah.
 - A zone of moderate concentration (export values of \$10-\$100 million) comprising the states of Idaho, Colorado, South and North Dakota, Minnesota, California, Iowa, Montana, Oregon, Wisconsin, Illinois, New York and Missouri.
 - A zone of dispersion (export values below \$10 million) comprising the remaining states.
- Comparison of the 1998 distribution profile with that from 1988 data reveals the following trends:

- Utah later joined Washington, the only state in the zone of strong concentration during the full period of study. Utah's export share increased by 8% during 1988-1998, while Washington's share decreased by 14%. Nevertheless, this major trade zone consistently absorbed 40-45% of the total agricultural exports from Alberta to the U.S. throughout the study period. It expanded by 3.5 times over the 10-year period, outperforming the rest of shipment destinations by a margin of \$90-\$130 million.
- The number of states in the zone of moderate concentration doubled (from 6 to 13). Its share of total agricultural shipments fluctuated from 50-55%, although there was a decrease of 5% in 1998 over 1988 figures. This reflects the slower pace of growth of this trade zone relative to the zone of strong concentration. The value of this group's exports tripled from \$194 million in 1988 to \$555 million in 1998.
- Export shipments to the dispersion zone doubled from \$29 million in 1988 to \$57 million in 1998. The zone's share of total agricultural shipments fluctuated between 5% and 8%, although it decreased in 1998 owing to lower shipments to a number of states.

A test of the stability of this pattern using Superman coefficients revealed the following:

- the consistency of export flows to identified groups of states varied in the range of 0.87-0.96 with respective p-values <0.01 during 1988-1998, indicating high stability in state markets.

Figure 1.7. Distribution of Alberta exports to U.S. by state in agricultural sector in 1998, (\$ millions)



Source: TIERS, CTA and the Western Centre for Economic Research

Distribution Pattern By State For The Rest of Categories

Figure 1.8 reports the concentration of 1998 Alberta export flows, excluding the agriculture and energy sectors. During the period of 1988-1998 Alberta exports to the U.S. increased four fold. California was a major destination for these exports, which were otherwise widely distributed. High rates of growth in most states suggest new areas of market opportunity for Alberta business.

Four major groupings can be identified:

- A zone of strong concentration (export values of \$700-\$1,000) comprising California, Texas and New York.
- A zone of moderate concentration (export values of \$300-\$700) made up of Washington, Oregon, Wisconsin and Illinois.
- A zone of growth (export values of \$100-\$300 million) comprising 18 states.
- A zone of dispersion (export values below \$100 million) consisting of the remaining states.

Comparison of the 1998 distribution profile with that of 1988 reveals the following trends:

- California is the largest export market, maintaining an export share in the range of 9%-12% during 1988-1998. Texas and New York also became major points of destination for most Alberta exports and are approaching California in terms of trade volumes. Exports to New York have grown seven fold since 1988, and exports to Texas five fold. Illinois, Wisconsin and Washington were originally positioned among Alberta's top export destinations but eventually moved into the moderate trade zone. The zone of strong concentration retained its share of about 31%, with slight variation during the period of study.
- In the zone of moderate concentration shipments were in the range of \$70-\$400 millions depending on the year. Exports to Washington, Illinois, Oregon, and Wisconsin grew 3.2 times during 1988-98, lower than overall average growth of 4.7. Their share of total exports ranged from 20-29%.
- A zone of growth contains states whose exports outgrew the \$100 million level but did not exceed \$300 million. It is characterised by a growth multiple of 4.8 in comparison to the overall multiple of 4.7. Alaska, Kansas, Colorado and Iowa experienced a boom of export flows, growing by 16.8, 9.5, 8.0 and 5.6 times, respectively.

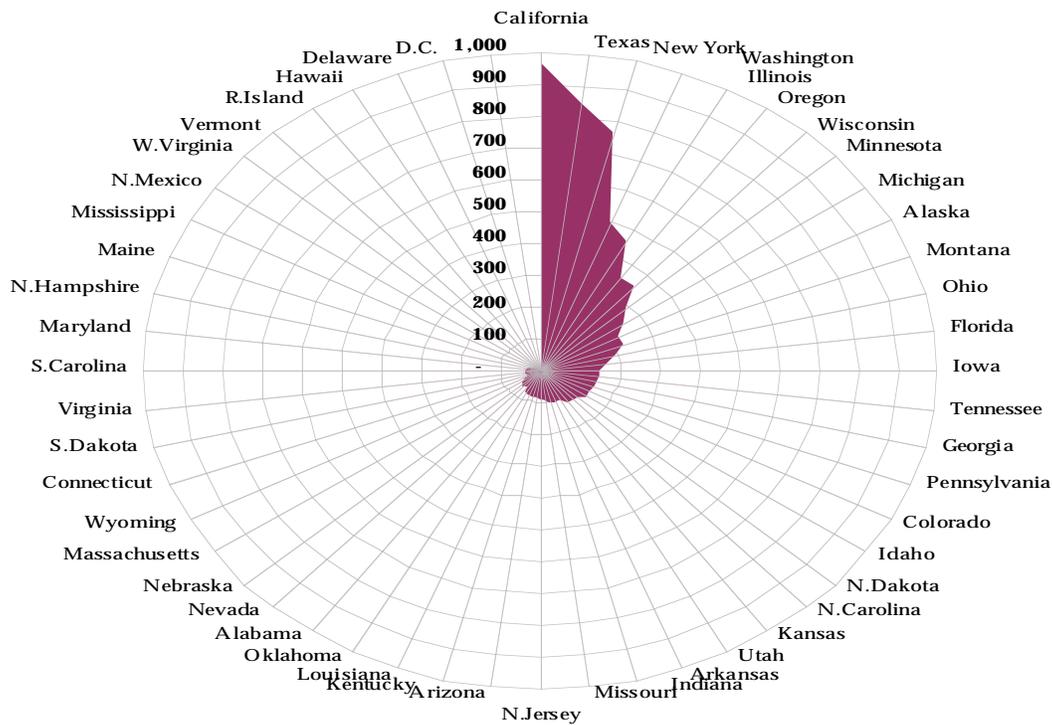
- Among those states with export values below the level of \$100 million, twelve have experienced extremely high growth multiples, including Oklahoma (11 times), New Hampshire (15 times), and West Virginia (11 times). This could signify emergence of new directions for export flows from Alberta to the U.S. It might also be a trend towards even more dispersion of exports in contrast to their prevailing concentration.

A test of the stability of this pattern using Spearman coefficients showed the following:

- the consistency of export flows to identified groups of states varied in the range of 0.82-0.96 with respective p-values <0.01 during 1988-1998, indicating a high stability level and market consistency for overall shipments by destination;

Consideration of the state destination of Alberta exports to U.S. and their variability indicate that a strong growth potential is still present, offering the opportunity for more intensive business linkages.

Figure 1.8. Distribution of Alberta exports to U.S. by state, excluding agricultural and energy sectors, 1998, (\$ millions)



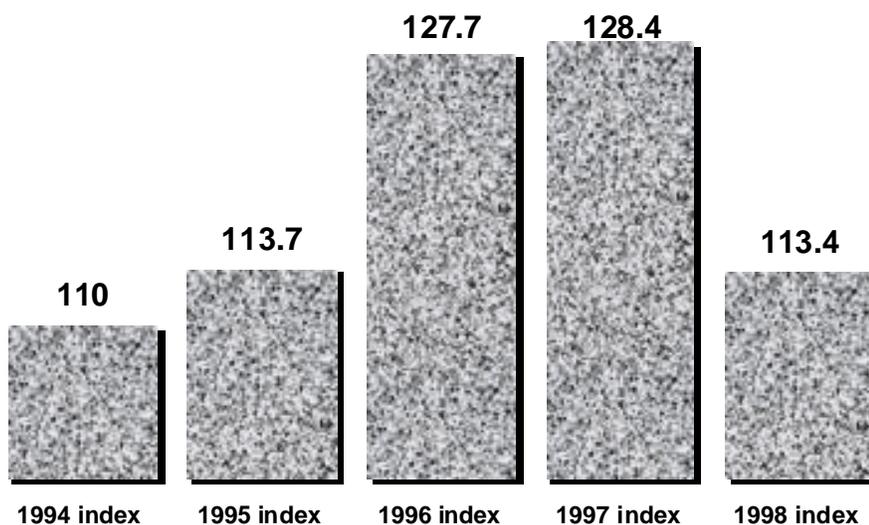
Source: TIERS, CTA and the Western Centre for Economic Research

AGGREGATE PRICE CHANGE IN ALBERTA EXPORTS

The WCER index of Alberta export prices covers some 87% of the province's exports. An aggregate price index (1992=100) weighted by 1998 export values is provided for the years 1994 through 1998 (Figure 1.9). The WCER price index consists of crude oil, natural gas, coal, fertilizers, organic and inorganic chemicals, woodpulp, sawn lumber, paper products, live animals, wheat, oilseeds, meats, machinery, telecommunications equipment, and nickel alloys. During 1998 the index fell to 113.4 from its level of 128.4 in 1997, a fall of 11.7%. This decline was dominated by the decline in price of crude oil. Of the 17 individual items contained in the index, 10 displayed price declines, 6 increases, and in one case there was no change.

The 7.8% decline from 1997 export levels to \$30.736 billion was more than accounted for by the fall in export prices. More detailed estimates of the effects of price and volume changes on export shipments in selected HS categories are contained in relevant sections of the report.

Figure 1.9. WCER index of Alberta export prices 1994-1998 period (1992=100)



Source: WCER

OTHER WESTERN PROVINCES

Table 1.6 shows British Columbia's top twenty exports. In 1998, these twenty categories amounted to 89.3% of total export value and the top three exports equaled almost 54% of total shipments. Although the numbers for B. C. have changed little since 1996 and 1997, it is significant that energy exports replaced wood pulp exports in the number 2 position. The most notable change from 1997 to 1998 was a \$240 million dollar increase in industrial machinery exports. In 1996 growth in the top twenty accounted for just over 82% of the total, in 1997 that number jumped to 90%, and was 86% 1998.

During 1998, British Columbia's U.S. market share rose dramatically, from 54.8% in 1997 to 63.6%. While B. C. remains the province least dependent on the American market, traditionally important exports -- wood products, fish and a variety of minerals -- are much more likely to go to the U.S. than they were prior to the FTA. For example, sawn lumber (HS 44), energy (HS 27), fish (HS 03), machinery (HS 84) and various metals (HS 26, 76 and 79) have greatly increased their U.S. market share since 1988.

Table 1.6. British Columbia's top twenty exports and their share in export growth (\$ millions)

HS CATEGORY	1998 Export Value	As % of 1998 Total	1988 Export Value	Export Growth	% of total export Growth	US Share, %	
						1988	1998
44) Sawn lumber	8,402	31.5	2,830	5,572	60.2	57.2	74.4
27) Mineral fuels, oils, distillates	3,142	11.8	573	2,569	27.8	27.3	44.1
47) Woodpulp	2,789	10.5	776	2,013	21.7	23.1	22.1
48) Paper & paperboard	2,063	7.7	1,015	1,048	11.3	66.0	71.6
84) Machinery, boilers, appliances	1,237	4.6	281	956	10.3	74.7	84.0
85) Electrical Equipment	958	3.6	55	903	9.8	70.0	74.9
87) Vehicles, parts	813	3.0	219	594	6.4	82.8	83.6
3) Fish & Shellfish	730	2.7	140	590	6.4	24.6	61.1
76) Aluminum & articles thereof	643	2.4	99	544	5.9	16.6	30.3
26) Ores, slag, & ash	476	1.8	9	467	5.0	.90	5.1
79) Zinc & articles thereof	418	1.6	273	145	1.6	68.5	75.8
90) Optical, photo equip., instruments	360	1.3	28	332	3.6	63.2	75.1
73) Articles of iron & steel	313	1.2	97	216	2.3	92.6	93.1
39) Plastics	295	1.1	38	257	2.8	75.7	94.1
94) Furniture, bedding	267	1.0	38	229	2.5	71.5	68.7
29) Organic chemicals	246	0.9	51	195	2.1	36.8	25.3
28) Inorganic chemicals	215	0.8	41	174	1.9	74.7	71.6
21) Art of apparel, clothing accessories	161	0.6	14	147	1.6	90.3	96.5
49) Printed books, newspapers, pictures	150	0.6	27	123	1.3	93.6	97.1
72) Iron & steel	143	0.5	70	73	0.8	89.6	91.9
Total top twenty	23,822	89.3	15,842				
Growth top twenty				7,977	86.0		
U.S. Share of top twenty						42.2	62.2
All other exports	2,855	10.7	1,577				
Growth of all other exports				-7,890	-85.2		
U.S. share of all other exports						47.7	75.5
Total exports	26,676	100.0	17,419				
Total export growth				9,258	100.0		
U.S. share of total export growth						42.7	63.6

Source: TIERS, CTA and the Western Centre for Economic Research

Manitoba turned in another strong export performance in 1998 (Table 1.7). Export values rose to \$7.8 billion, an increase of 11.3% over 1997 levels. Virtually all of Manitoba's top twenty non-agricultural exports participated in the growth. Once again, the U. S. market has proved to be a significant outlet for Manitoba products, with 78.6% of shipment values destined there.

Table 1.7. Manitoba's top twenty exports and their share in export growth (\$ millions)

HS CATEGORY	1998 Export Value	As % of 98 Total	1988 Export Value	Export Growth	% Growth Share	US Share, %	
						1988	1998
87) Vehicles, parts	881	11.3	196	685	14.0	96.1	97.0
27) Mineral fuels, oils, distillates	752	9.6	111	641	13.1	100.0	100.0
84) Machinery, boilers, appliances	552	7.1	359	193	3.9	88.4	89.4
12) Oil seeds, misc. grain, seed, fruit	515	6.6	238	277	5.7	21.2	24.1
10) Cereals	482	6.2	666	- 184	-3.8	3.8	27.4
88) Aircraft, spacecraft, parts	458	5.9	89	369	7.6	96.7	98.9
15) Animal/vegetable fats, oils	416	5.3	81	335	6.8	57.1	43.7
1) Live Animals	414	5.3	93	321	6.6	99.8	99.9
74) Copper and articles thereof	370	4.7	5	365	7.5	91.7	100.0
94) Furniture, bedding	251	3.2	33	218	4.5	98.1	97.4
44) Sawn lumber	240	3.1	52	188	3.8	9.2	98.2
48) Paper & paperboard	236	3.0	109	127	2.6	96.1	89.9
15) Nickel and articles thereof	216	2.8	1	215	4.4	83.6	9.5
2) Meat & edible offal	192	2.5	73	119	2.4	86.7	45.8
85) Electrical Equipment	187	2.4	63	124	2.5	94.3	95.3
39) Plastics	180	2.3	51	129	2.7	93.0	98.4
20) Preparations of fruits, nuts	141	1.8	12	129	2.6	25.7	100.0
7) Edible vegetables; roots; tubers	100	1.3	53	47	1.0	9.3	19.5
21) Art of apparel, clothing accessories	94	1.2	9	85	1.7	97.2	99.6
22) Printed books, newspapers, pictures	90	1.2	14	76	1.5	79.2	78.2
Total top twenty	6,766	86.7	2,308				
Growth top twenty				4,458	91.1		
U.S. Share top twenty						54.8	77.7
All other exports	1,036	13.3	601				
Growth of all other exports				435	8.9		
U.S. share of all other exports						70.8	84.3
Total exports	7,802	100.0	2,909				
Total export growth				4,893	100.0		
U.S. share of total export growth						58.1	78.6

Source: TIERS, CTA and the Western Centre for Economic Research

Commodity price weakness adversely affected the value of Saskatchewan exports, which declined 7.1% in value in 1998 to \$9.1 billion from \$9.8 billion in 1997. Table 1.8 shows that Saskatchewan's top twenty HS categories accounted for 97.4% of total international shipments in 1998. As in the case of the other western provinces, the U. S. market share displays a rising trend, amounting to 59.6% of total export value in 1998.

Table 1.8. Saskatchewan's top twenty exports and their share in export growth (\$ millions)

HS CATEGORY	1998 Export Value	As % of 98 Total	1988 Export Value	Export Growth	% Growth Share	US Share, %	
						1988	1998
31) Fertilizers	2,003	22	1,169	834	24.9	53.0	61.2
10) Cereals	1,902	20.9	2,877	-975	-29.2	2.3	20.0
27) Mineral fuels, oils, distillates	1,582	17.4	729	853	25.5	100.0	100.0
12) Oil seeds, misc. grains	837	9.2	337	500	15.0	6.4	17.2
7) Edible vegetables; roots; tubers	361	4	15	346	10.3	14.6	5.5
47) Woodpulp	253	2.8	176	77	2.3	54.3	55.5
90) Optical, photo equip., instruments	237	2.6	4	233	7.0	75.1	99.3
44) Sawn lumber	228	2.5	24	204	6.1	99.1	99.9
84) Machinery, boilers, appliances	203	2.2	53	150	4.5	90.2	84.4
1) Live Animals	193	2.1	45	148	4.4	98.5	99.1
48) Paper & paperboard	192	2.1	19	173	5.2	99.4	99.9
28) Inorganic chemicals	143	1.6	78	65	1.9	92.0	89.8
11) Products milling; malt; starches	116	1.3	10	106	3.2	41.5	15.9
15) Animal/vegetable fats, oils	116	1.3	12	104	3.1	27.4	97.0
02) Meat & edible meat offal	111	1.2	57	54	1.6	93.3	90.9
72) Iron and steel	102	1.1	59	43	1.3	99.6	99.9
38) Misc. chemical products	80	0.9	11	69	2.1	99.7	95.6
23) Residues and wastes from food	78	0.9	3	75	2.2	20.9	71.2
85) Electrical Equipment	61	0.7	22	39	1.2	93.3	92.3
87) Vehicles, parts	57	0.6	12	45	1.3	98.7	94.4
Total top twenty	8,855	97.4	5,712				
Growth top twenty				3,143	94.0		
U.S. Share of top twenty						33.4	58.9
All other exports	249	2.6	48	201			
Growth of all other exports					6.0		
U.S. share of all other exports							
Total exports	9,104	100.0	5,760				
Total export growth				3,344	100.0		
U.S. share of total export growth						55.5	59.6

Source: TIERS, CTA and the Western Centre for Economic Research

ALBERTA: SELECTED 1998 EXPORT HIGHLIGHTS

Energy and Plastics Exports

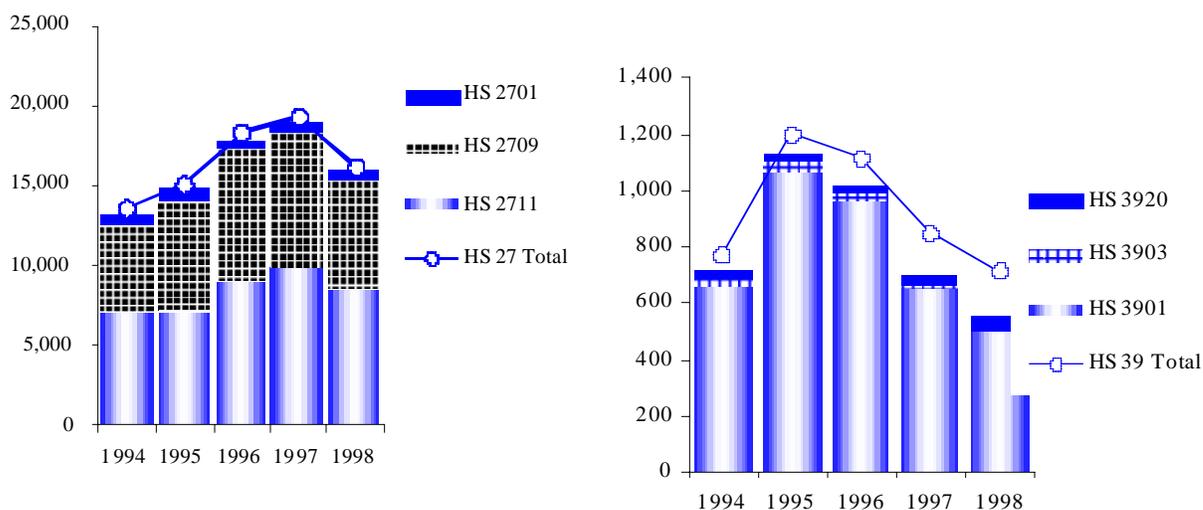
Table 1.9 and Figure 1.10 show that the value of 1998 commodity exports from the entire energy sector fell by 15.7% from the levels of the previous year. Crude oil exports fell in value by some 21%, while the fall in natural gas shipments was 12%. The export price index for crude oil declined in 1998 by 32% implying that an increased volume of shipments offset some of the price decline. Relatively warm winter weather in large parts of North America affected the volume of natural gas shipments in 1998 so that the decline in gas exports was attributable both to both lower prices and lower volumes. Coal exports fell slightly from 1997 in the aftermath of slow economic activity in Asia. The decline in the value of polyethylene shipments, which account for the overwhelming share of plastic exports, resulted from lower prices.

Table 1.9. Exports of energy and plastics: selected categories 1997 and 1998 (\$ millions)

HS Category		97 export value	98 export value	% change 97-98
2711	Natural gas	9,804.0	8,626.0	-12.0
2709	Crude oil	8,500.6	6,692.1	-21.3
2701	Coal	563.0	543.6	-3.4
Total of the above		18,867.6	15,861.7	-15.9
Total HS 27 exports	Energy	19,221.3	16,197.8	-15.7
3901	Polyethylene	653.3	503.7	-22.9
3903	Plastic plates, sheets	9.0	1.8	-80.0
3920	Polystyrene	36.2	45.1	24.6
Total of the above		698.5	550.6	-21.2
Total of HS 39 exports	Plastics	841.4	711.3	-15.5

Source: TIERS, CTA and the Western Centre for Economic Research

Figure 1.10. Exports of energy and plastics products, 1994-1998 (\$ millions)



ENERGY

PLASTICS

Exports of Lumber, Pulp and Paper Products

Table 1.10 and Figure 1.11 contain data for 1998 and 1997 on exports of lumber, pulp and paper products. HS44 shipments rose in value by 9% in response to the buoyant and growing residential construction market for particle board. The decline in sawn lumber represented both lower unit prices and reduced volumes.

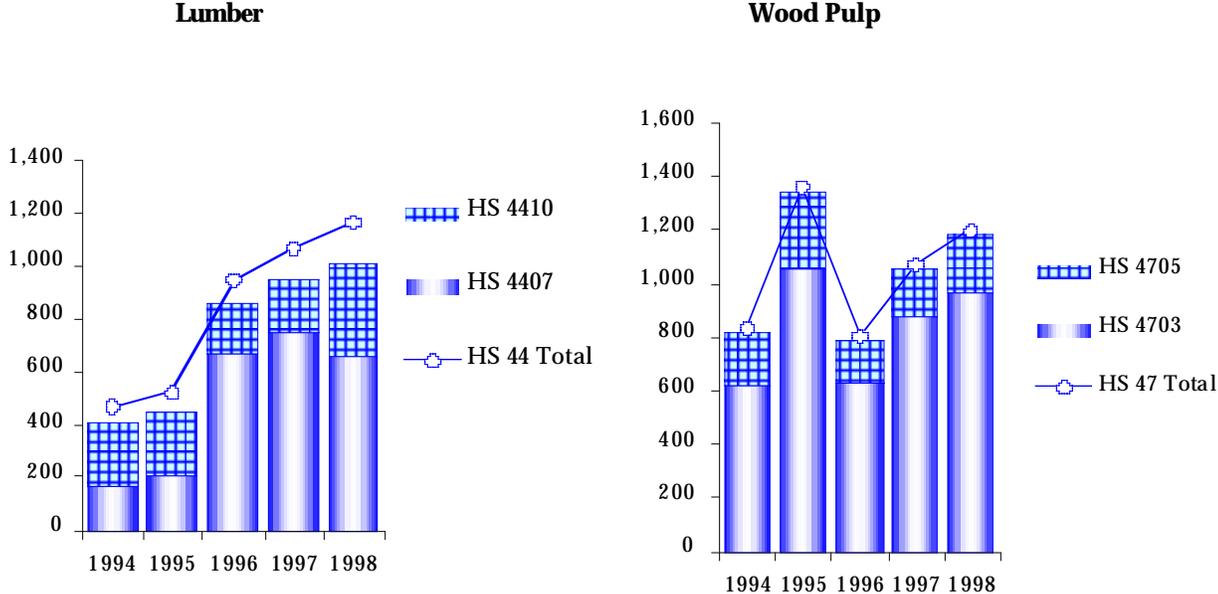
Table 1.10. Exports of lumber, pulp and paper: selected categories, 1997 and 1998 (\$ millions)

HS Category		97 export value	98 export value	% change 97-98
4407	Sawn lumber	750.0	661.0	-11.9
4410	Particle board	196.6	348.5	77.3
Total of the above		946.6	1,009.5	6.6
Total HS 44 exports Lumber		1,063.1	1,159.3	9.0
4703	Chemical wood pulp	876.1	973.6	11.1
4705	Semi-chemical pulp	164.2	210.6	28.3
Total of the above		1,040.3	1,184.2	13.8
Total HS 47 exports Pulp		1,062.4	1,193.9	12.4
Total HS 48 Paper and paperboard		206.3	222.2	10.7

Source: TIERS, CTA and the Western Centre for Economic Research

Increased shipments of wood pulp resulted from both improved prices and increased volume. The volume of paper and paperboard shipments also increased in 1998, a result of more capacity coming on stream in recent years. Somewhat improved paper and paperboard prices also contributed to the increase.

Figure 1.11. Exports of lumber and wood pulp, 1994-1998, (\$ millions)



Meat Products

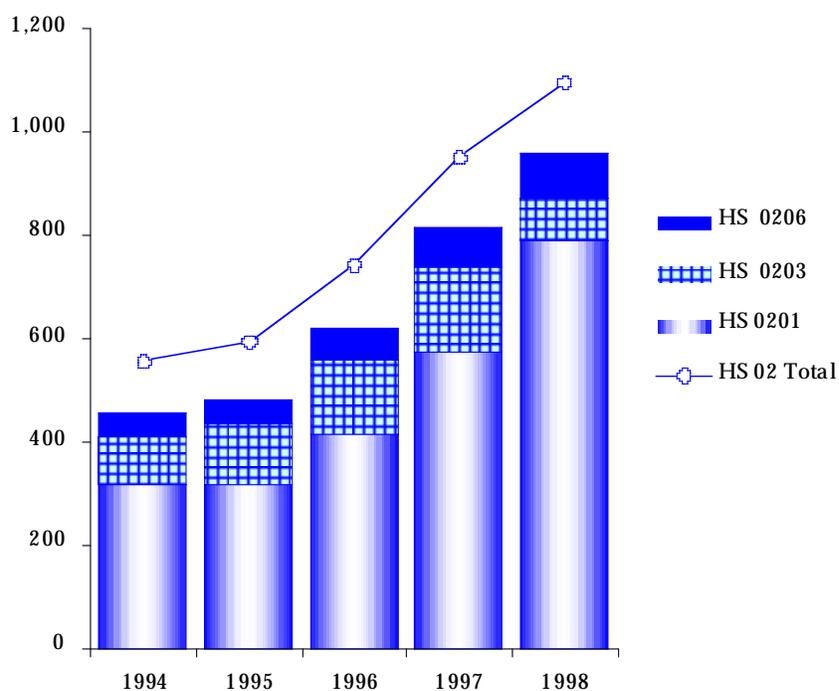
Table 1.11 and Figure 1.12, which present export values for meat products in 1996 and 1997, depict another large jump in exports of Alberta's processed meats, with shipments exceeding \$1 billion for the first time. Beef exports increased in value by 37%. However, difficulties in the hog producing sector, including a decline in prices, are evident in the 50% fall in pork shipments. The meat products industry has grown very rapidly in the past several years, with the result that Alberta is now the meat processing centre of Western Canada.

Table 1.11. Exports of meat products: selected categories, 1997 and 1998 (values in \$ millions)

HS Category	97 export value	98 export value	% change 97-98
201 Beef	575.3	788.8	37.1
203 Pork	165.2	81.9	-50.4
206 Edible livestock offal	68.1	88.9	30.5
Total of the above	808.6	959.6	29.7
Total HS 02 exports Meat Products	944.4	1,093.5	15.8

Source: TIERS, CTA and the Western Centre for Economic Research

Figure 1.12. Exports of meat products, 1994-1998, (\$ millions)



Vegetable Products and Oilseeds

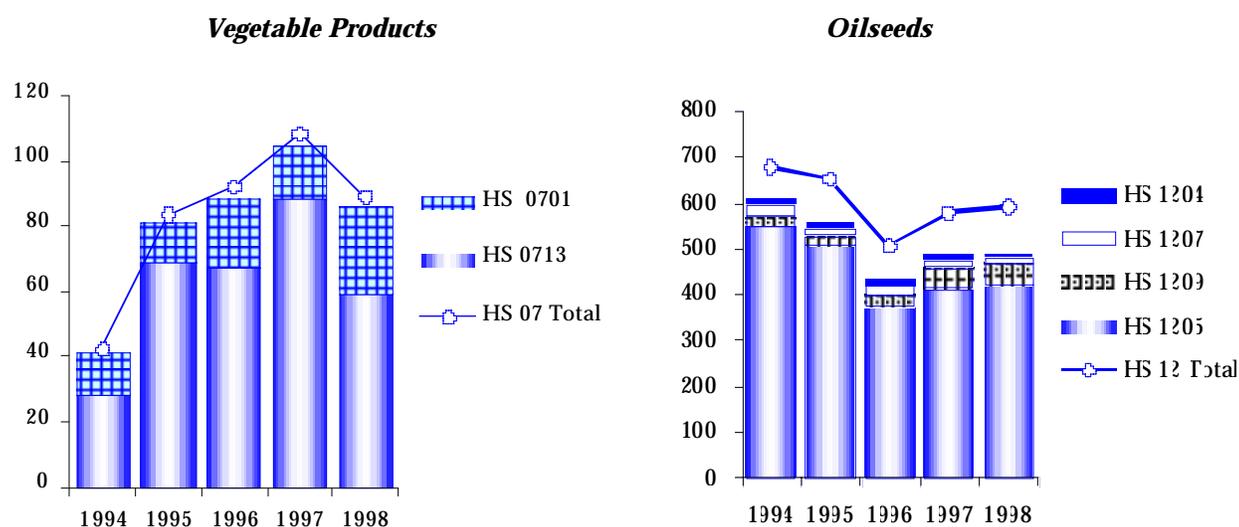
Table 1.12 and Figure 1.13 summarize the 1998 export record of selected oilseed and vegetable exports. Lower shipment values for vegetable products in 1998 were partially offset by an increase in potato exports. Oilseed shipments increased slightly from 1997 levels, a combination of higher prices and larger volumes.

Table 1.12. Exports of vegetable and oilseeds: selected categories 1997 and 1998 (\$ millions)

HS Category	97 export value	98 export value	% change 97-98
713 Dried legumes	88.7	59.7	-32.7
701 Potatoes	15.9	26.2	65.1
Total of the above	104.5	85.9	-17.9
Total HS 07 exports Vegetable products	107.9	88.2	-18.3
1205 Canola	413.8	420.0	1.5
1209 Sowing seeds	44.6	46.8	5.0
1207 Linseed	18.7	15.3	-15.5
1204 Sowing seeds	11.8	8.0	-32.5
Total of the above	488.3	490.1	0.4
Total HS 12 exports Oilseeds	577.7	588.7	1.9

Source: TIERS, CTA and the Western Centre for Economic Research

Figure 1.13. Exports of vegetable and oilseeds, 1994-1998, (\$ millions)



Machinery and Parts

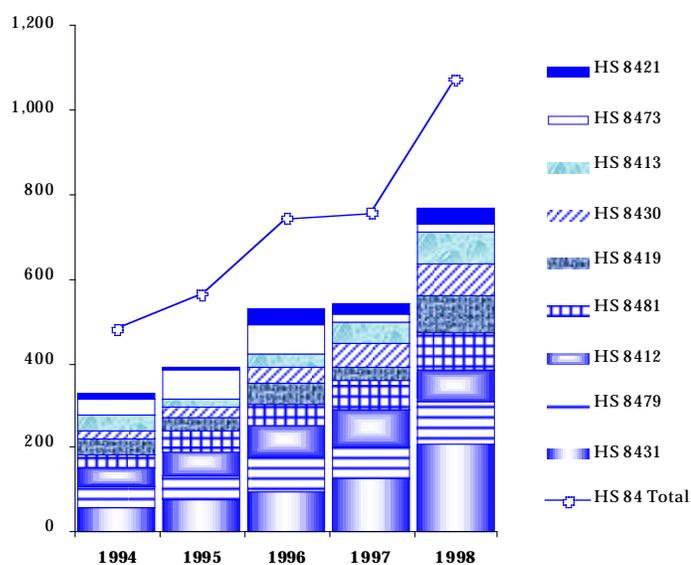
Table 1.13 and Figure 1.14 present the value of Alberta exports of machinery and equipment. Shipments exceeded \$1 billion for the first time in 1998, an increase over 1997 levels of more than 40%. Most 4 digit HS categories experienced an increase in shipment values. U. S. market share was 63% in 1998, compared with 61%, 64.8% and 55% in 1997, 1996 and 1988 respectively.

Table 1.13. Exports of machinery & mechanical appliances: selected categories, 1997 and 1998 (\$ millions)

HS Category		97 export value	98 export value	% change 97-98
HS 8431	Parts for lift, move machinery	123.4	208.1	68.6
HS 8479	Special mach, appl.	73.3	98.3	34.2
HS 8481	Taps, valves for boilers	66.1	90.7	37.2
HS 8419	Electric dryers and distillers	34.6	86.3	149.5
HS 8413	Pumps	44.8	77.4	72.8
HS 8430	Moving, grade, bore mach.	58.5	75.0	28.3
HS 8412	Hydraulic engines and parts	94.9	72.6	-23.5
HS 8421	Centrifuges and filtering machines	22.6	35.9	59.0
HS 8473	Parts for office machinery	21.2	19.6	-7.3
Total of the above		539.2	763.9	41.7
Total of HS 84 exports Machinery		753.7	1070.4	42.0

Source: TIERS, CTA and the Western Centre for Economic Research

Figure 1.14. Exports of machinery & mechanical appliances, 1994-1998, (\$ millions)



Electrical Equipment and Parts

In 1998, this two digit HS category was ranked second in Alberta in terms of export values. As Table 1.14 and Figure 1.15 below reveal, the export value increased by some 31% in 1998. Exports of transmission equipment for radio and TV accounted for more than half of export values with telephone sets and related equipment making up another one-fifth.

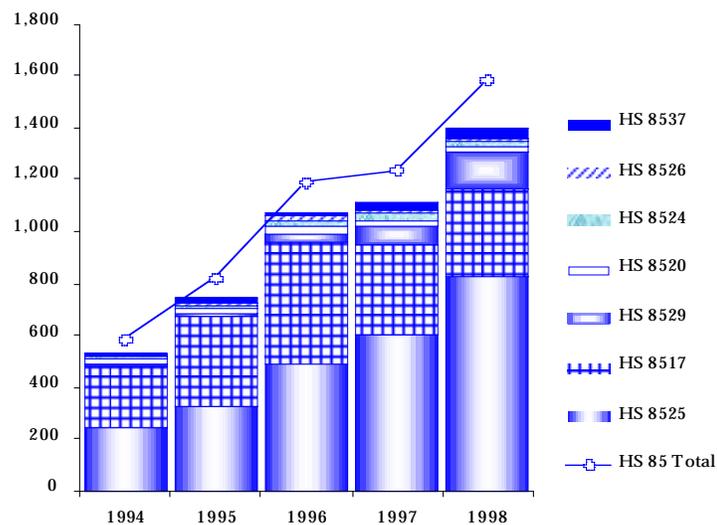
This is an industry clearly benefiting from the Canada-U. S. and North American free trade agreements. In 1988 the American market share for HS 85 was 65% of total shipments of \$113 million. In 1998 the American market share was 86%— a level also reached in 1995—and total cross border shipments amounted to \$1,355 million.

Table 1.14. Exports of electrical equipment: selected categories, 1997 and 1998 (\$ millions)

HS Category		97 export value	98 export value	% change 97-98
8517	Telephone sets	343.6	334.2	-2.7
8525	Transm. equipment Radio/TV	590.9	828.1	40.1
8529	Antennae for rad/TV	76.6	140.7	83.7
8520	Telephone answering machines	24.7	23.0	6.9
8526	Radio navigation aids	20.4	18.7	-8.3
8524	Tapes, software	20.0	15.3	-23.5
8537	Boards and panels	19.4	39.9	105.7
Total of the above		1095.6	1,399.9	27.8
Total of HS 85 exports	Electrical equipment	1203.2	1,575.1	30.9

Source: TIERS, CTA and the Western Centre for Economic Research

Figure 1.15. Exports of electrical equipment, 1994-1998, (\$millions)



Optical, Measuring and Precision Instruments

HS 90 (optical, photo equipment and measuring instruments) is another category with a high value-added content, and one that has enjoyed sustained growth over the past number of years. Data for 1998 and 1997 are shown in Table 1.15 and Figure 1.16 below. In 1998, exports of all items in this class rose by 5.6%, compared with 14% growth in 1997. The U.S. market share of HS 90 exports increased to 49% in 1998 compared with 37% in the previous two years.

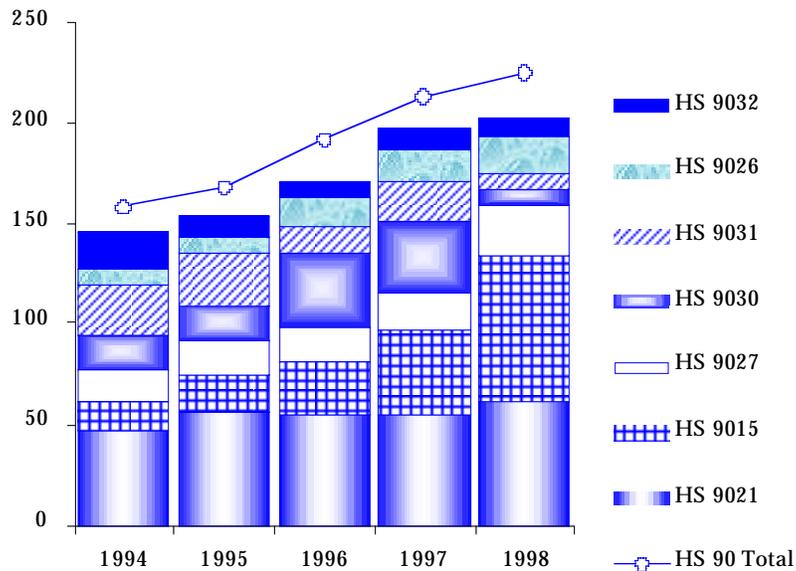
Orthopedic appliances continue as the largest single item in terms of export value. Many of the other items related to energy and environmental industry monitoring.

Table 1.15. Exports of optical, photo equipment, and measuring instruments: selected categories 1997 and 1998 (\$ millions)

HS Category	97 export value	98 export value	% change 97/98
9021 Orthopedic appliances	55.6	62.3	12.0
9030 Oscill., electrical testing	34.7	7.9	-77.3
9015 Geographic. measure instruments	41.0	72.0	75.6
9027 Phys/chemical test equips.	18.9	24.7	31.1
9026 Flow check instruments	14.3	18.0	25.4
9031 Other measuring/check equip.	21.2	7.6	-64.2
9032 Auto control instruments.	11.3	10.6	1.9
Total of the above	197.0	203.4	3.1
Total of HS 90 exports	212.8	224.7	5.6

Source: TIERS, CTA and the Western Centre for Economic Research

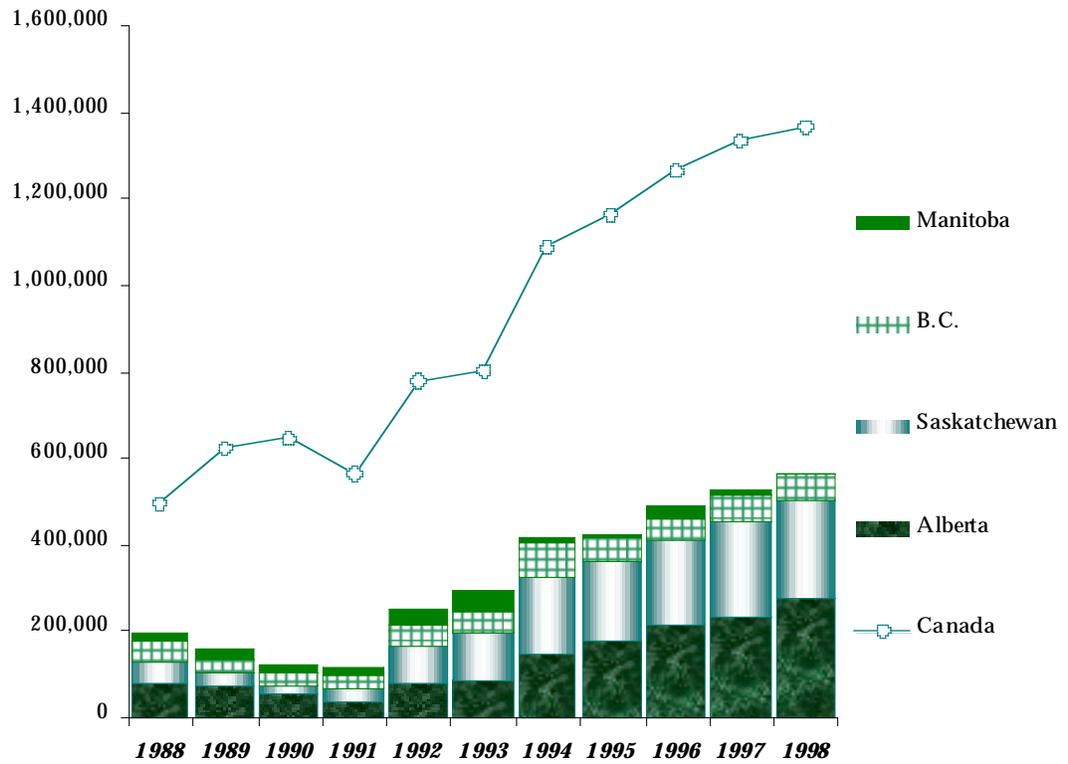
Figure 1.16. Exports of optical, measuring instruments, 1994-1998, (\$ millions)



EXPORTS TO MEXICO

Figure 1.17 summarizes the exports of each of the four western provinces to Mexico in the years from 1988 to 1998. Over this period exports have increased from \$193 million to \$561 million. In 1998, the increase over the previous year amounted to 7.5%. Currently, the Alberta share of Western Canadian shipments is almost 50%, an increase of 4.3% over 1997. Western Canadian exports, as a share of total Canadian exports to Mexico, rose to 41.2%, up from 39.3% in 1997. Despite this overall growth trend, exports from Manitoba decreased by 67%, and British Columbia shipments decreased by 6% from 1997 levels.

Figure 1.17. Provincial exports to Mexico, 1988-1997, (\$ thousands)



Source: TIERS, CTA and the Western Centre for Economic Research

Alberta Merchandise Exports to Mexico

Table 1.16 presents the top ten Alberta merchandise exports to Mexico in each of the reported years. Between 1994 and 1998, Alberta exports to Mexico rose 1.86 times, or some 15% greater than Western Canadian growth as a whole.

Table 1.16. Top ten Alberta exports to Mexico in 1994, 1995, 1997 and 1998 (\$ thousands)

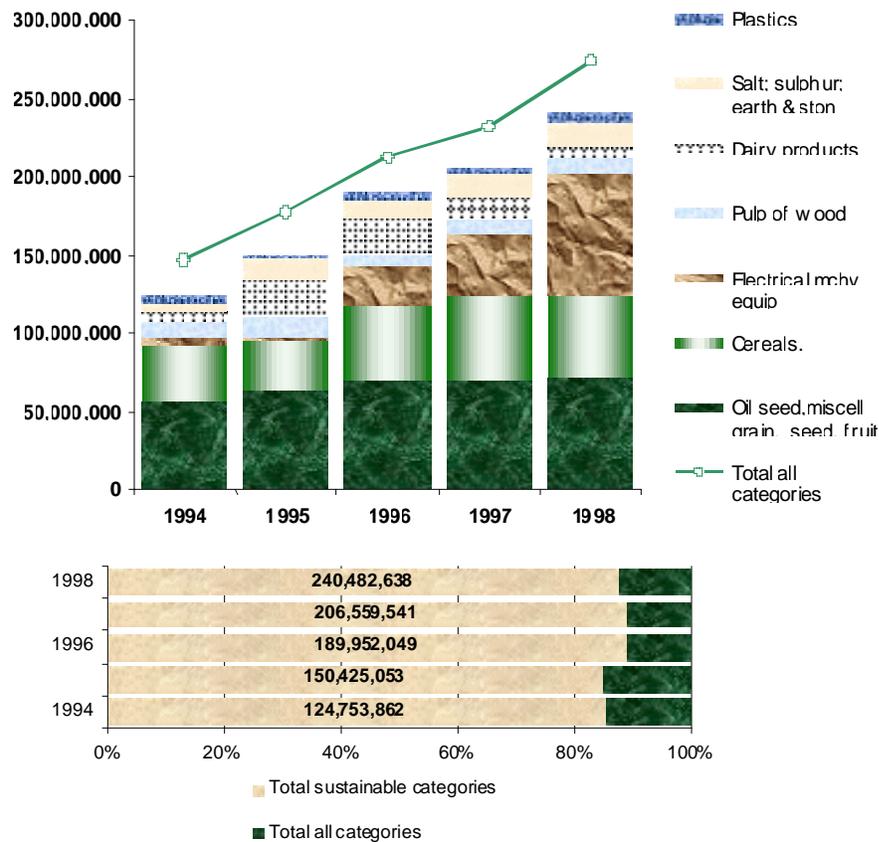
CATEGORY	HS	94 Exports (\$value)	CATEGORY	HS	95 Exports (\$value)
Oil seed, misc. grain, seed, fruit	12	56,709	Oil seed, misc. grain, seed, fruit	12	69,416
Cereals	10	35,818	Cereals	10	26,419
Pulp of wood; cellulosic mat; waste	47	11,161	Dairy products; eggs; honey	4	18,154
Salt; sulphur; earth and stone; plaster	25	6,811	Salt; sulphur; earth and stone; plaster	25	13,273
Mineral fuels, oils, prod of distillates	27	6,340	Mineral fuels, oils, prod of distillates	27	12,832
Dairy products; eggs; honey	4	5,927	Pulp of wood; cellulosic mat; waste	47	12,520
Meat & edible offal	2	4,918	Animal/vegetable fats, oils	15	4,513
Plastics and articles thereof	39	4,241	Fertilizers	31	4,084
Elec mchy equip parts; sound recorders	85	4,084	Plastics and articles thereof	39	2,964
Prod mill; malt; starches;	11	3,888	Elec mchy equip parts; sound recorders	85	2,236
<i>Sub-total of top 10 exports</i>		<i>139,901</i>	<i>Sub-total of top 10 exports</i>		<i>166,410</i>
Total Exports to Mexico (HS 01-99)		146,429	Total Exports to Mexico (HS 01-99)		170,322
Mexico as percent of Alberta's total		0.62%	Mexico as percent of Alberta's total		0.64%
Canadian Total to Mexico		1,083,506	Canadian Total to Mexico		1,106,890
Percent of Canadian Total		13.51%	Percent of Canadian total		15.39%

CATEGORY	HS	97 Exports (\$value)	CATEGORY	HS	98 Exports (\$value)
Oil seed, misc. grain, seed, fruit	12	74,033	Elec mchy equip parts; sound recorders	85	78,524
Cereals	10	41,008	Oil seed, misc. grain, seed, fruit	12	71,265
Elec mchy equip parts; sound recorders	85	39,170	Cereals	10	53,641
Dairy products; eggs; honey	25	15,131	Salt; sulphur; earth and stone; plaster	25	14,951
Salt; sulphur; earth and stone; plaster	4	13,184	Meat & edible offal	2	10,568
Mineral fuels, oils, prod of distillates	27	11,009	Pulp of wood; cellulosic mat; waste	47	9,344
Pulp of wood; cellulosic mat; waste	47	9,446	Nuclear reactors, boilers, engines	84	7,421
Plastics and articles thereof	39	4,701	Optical, photo, cine, meas, precision	90	6,859
Optical, photo, cine, meas, precision	90	4,144	Dairy products; eggs; honey	4	6,406
Meat & edible offal	2	3,255	Plastics and articles thereof	39	6,349
<i>Sub-total of top 10 exports</i>		<i>215,080</i>	<i>Sub-total of top ten exports</i>		<i>265,332</i>
Total Exports to Mexico (HS 01-99)		220,927	Total Exports to Mexico (HS 01-99)		273,642
Mexico as percent of Alberta's total		0.66%	Mexico as percent of Alberta's total		0.89%
Canadian Total to Mexico		1,272,600	Canadian Total to Mexico		1,363,491
Percent of Canadian total		17.36%	Percent of Canadian total		20.07%

Source: Tiers, CTA and the Western Centre for Economic Research

Mexico remains a small market—less than 1% of Alberta exports—yet this share of total provincial shipments has increased from 0.62% in 1994 to 0.89% in 1998. Export flow dynamics suggest, however, that the Mexican market is of relatively greater significance to Alberta's service sector. In general, the profile of the top ten exports in 1998 looks very much like that of previous years, with shipments of oilseeds, cereals and dairy products amounting to 48% of the total value of exports. An important trend that continued through 1998 was the increase in sales of provincially produced communications equipment, which now contributes to 28.7% of the value of Alberta's exports to Mexico. Among the top ten export categories, seven remained in the list of top contributors throughout the 1994-1998 period, as illustrated by Figure 1.18. Their share of Alberta's exports to Mexico varied slightly within the 82%-85% range during 1994-1998, indicating stability of demand for these HS categories.

Figure 1.18. Alberta exports of selected HS export categories to Mexico, 1994-1998 (\$ dollars)

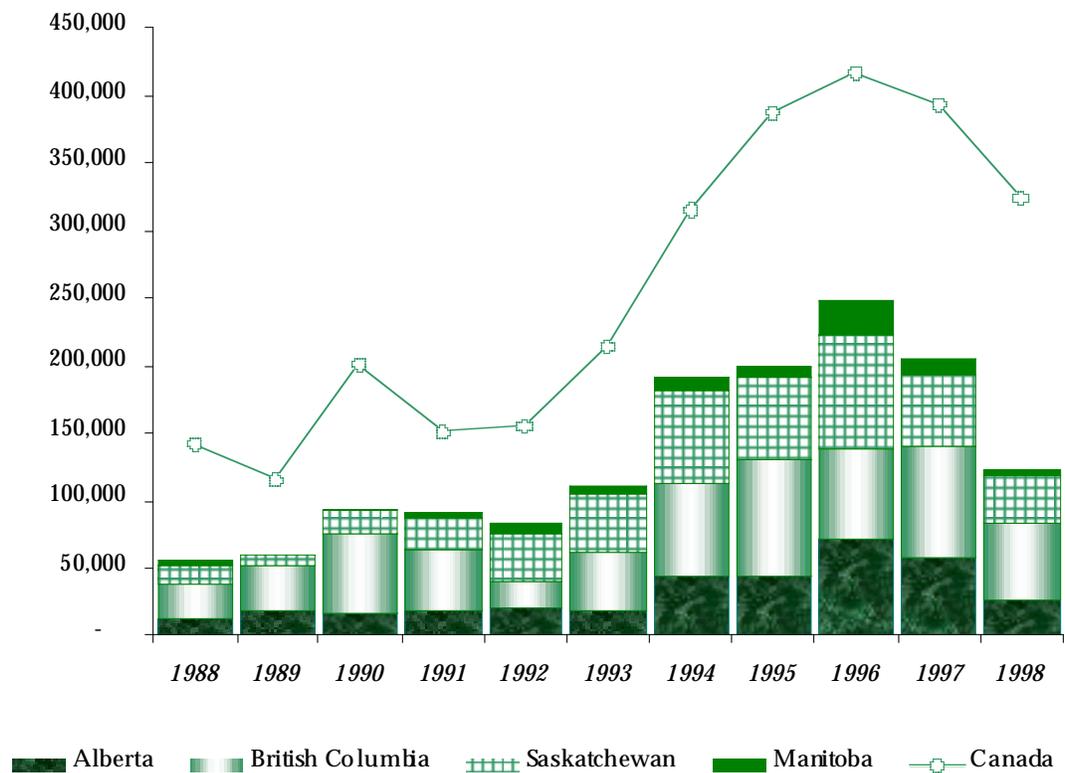


Source: TIERS, CTA and the Western Centre for Economic Research

EXPORTS TO CHILE

Figure 1.19 displays a non-linear trend in the value from 1988 to 1998 of provincial exports to Chile. British Columbia shipped \$57 million worth of merchandise to Chile in 1998—about 47% of western provincial exports. Alberta's 1998 exports of \$26.8 million account for almost 22% of exports from the western provinces. Saskatchewan's share grew to 28.5% in 1998; its shipments of \$34.9 were primarily made up of agricultural commodities. Exports from Canada to Chile fell in 1998 by 17%, and the western provincial shipments fell by almost 40%.

Figure 1.19. Provincial merchandise exports to Chile, 1994-1998 (\$ thousands)



Source: TIERS, CTA and the Western Centre for Economic Research

Alberta Merchandise Exports to Chile

Table 1.17 presents the top ten Alberta merchandise exports to Chile in each of the reported years. There were significant fluctuations in the value of Alberta's exports to Chile between 1994 and 1998. The 1998 level of exports constituted only 60.7% of the 1994 export values (1997 export values were 131% of 1994 export values). Chile's share of Alberta's total exports has also declined from 0.18% in 1994 to 0.08% in 1998.

Table 1.17. Top ten Alberta exports to Chile in 1994, 1995, 1997 and 1998 (\$ thousands)

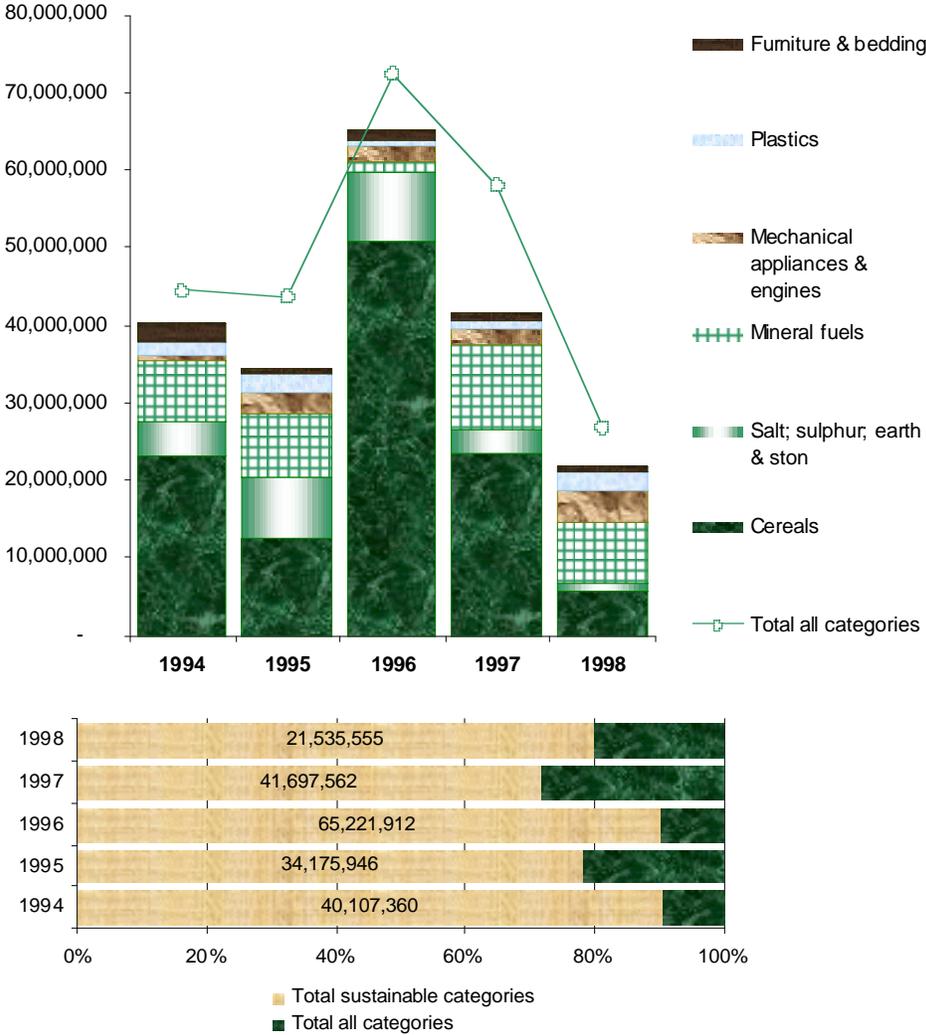
CATEGORY	HS	94 Exports (Svalue)	CATEGORY	HS	95 Exports (Svalue)
Cereals	10	23,057	Cereals	10	12,549
Mineral fuels, oils, prod of distillates	27	7,460	Mineral fuels, oils, prod of distillates	27	8,160
Salt; sulphur; earth and stone; plaster	25	4,747	Salt; sulphur; earth and stone; plaster	25	7,869
Furniture; bedding, mattress	94	2,510	Fertilisers	31	4,465
Elec mchy equip parts; sound recorders	85	1,783	Nuclear reactors, boilers, appliances	84	2,800
Inorgn chem; compds of prec met	28	1,640	Plastics and articles thereof	39	2,218
Plastics and articles thereof	39	1,443	Elec mchy equip parts; sound recorders	85	2,172
Nuclear reactors, boilers, appliances	84	887	Articles of iron or steel	73	589
Art of stone, plaster, cement, asbestos	68	221	Furniture; bedding, mattress	94	576
Meat and edible meat offal	2	126	Wood and articles of wood	44	455
Sub-total of top 10 exports		43,879	Sub-total of top 10 exports		41,859
Total Exports to Chile (HS 01-99)		44,173	Total Exports to Chile (HS 01-99)		43,550
Chile as percent of Alberta's total		0.18%	Chile as percent of Alberta's total		0.16%
Canadian Total to Chile		314,500	Canadian Total to Chile		387,486
Percent of Canadian Total		14%	Percent of Canadian total		11.2%

CATEGORY	HS	97 Exports (Svalue)	CATEGORY	HS	98 Exports (Svalue)
Cereals	10	23,416	Mineral fuels, oils, prod of distillates	27	8,059
Mineral fuels, oils, prod of distillates	27	11,042	Cereals	10	5,554
Fertilisers	31	8,034	Nuclear reactors, boilers, appliances	84	4,043
Salt; sulphur; earth and stone; plaster	25	3,029	Plastics and articles thereof	39	2,437
Vehicles o/t railw/tramw roll-stock	87	2,639	Vehicles o/t railw/tramw roll-stock	87	2,108
Inorgn chem; compds of prec metals	28	2,146	Elec mchy equip parts; sound recorders	85	1,871
Nuclear reactors, boilers, appliances	84	2,042	Salt; sulphur; earth and stone; plaster	25	1,075
Plastics and articles thereof	39	1,175	Meat and edible meat offal	2	387
Articles of iron or steel	73	993	Furniture; bedding, mattress	94	365
Furniture; bedding, mattress	94	990	Optical, photo, cine, meas	90	189
Sub-total of top 10 exports		55,512	Sub-total of top ten exports		26,093
Total Exports to Chile (HS 01-99)		57,956	Total Exports to Chile (HS 01-99)		26,815
Chile as percent of Alberta's total		0.17%	Chile as percent of Alberta's total		0.08%
Canadian Total to Chile		392,435	Canadian Total to Chile		323,353
Percent of Canadian total		14.7%	Percent of Canadian total		8.3%

Source: TIERS, CTA and the Western Centre for Economic Research

Figure 1.20 displays the sharp fluctuations in the levels of Alberta's merchandise exports to Chile. Exports of raw materials and unprocessed commodities have diminished, but shipments of mineral fuels remain relatively stable. Examples of the type of shipments that continue to grow in value, despite the decline in totals, include machinery for resource extraction/processing, precision instruments and plastics. It is expected that the proportion of these higher-value, processed exports will continue to rise in the mix of shipments for Chile. Although export volumes have decreased in the last years, six HS classes maintained their status in top ten. However, their representation in total trade volumes varied in the range of 73%-93%.

Figure 1.20. Alberta exports of selected HS export categories to Chile during 1994-1998 (\$ dollars)



Source: TIERS, CTA and the Western Centre for Economic Research

CONCLUSION

Alberta's economy continues to benefit from export-led growth. Greater access to the American market remains the most important dynamic driving Alberta's export performance. In 1998 Alberta exported over \$280.8 of merchandise for every \$100 shipped in 1988. Looking at the value-added sectors the WCER has tracked over the last ten years, namely meat processing, paper and paperboard, machinery, electrical equipment, precision instruments, and furniture, the value of exports has risen from \$519 million in 1988 to \$4,523 million in 1998. That is a growth multiple of 8.7 (compared to an increase of 2.36 times in total exports and 2.35 in energy exports). Put otherwise, this group of value-added exports now accounts for over 14.7% of the value of Alberta exports, compared with 4% in 1988. The FTA and NAFTA have provided an excellent atmosphere for Alberta manufacturers and, as a result, the value-added content of provincial exports has risen.

SECTION II

OVERVIEW OF THE ALBERTA MERCHANDISE (GOODS) EXPORT SECTOR

INTRODUCTION

The importance of exports to the natural gas, crude oil, and agricultural sectors of the Alberta economy has a long history and is well known. However, in recent years a number of other sectors, particularly in manufacturing, have been successful in developing export markets. Section II reports on shipments, employment, and earnings in a number of selected Alberta goods producing sectors where export markets have been realised during the FTA years. The reader is warned that the data bases necessary to this evaluation utilise alternative classification systems which are not integrated with the Harmonised System used in Section I to describe and summarise Alberta's trading relationships. This poses a difficulty. Under ideal circumstances, to assess the provincial impact of the FTA one would like to have data for each firm on the portion of increased shipments and employment attributable to exports to the U. S. market, and the changes in employee earnings and firm profitability for those exporting under each HS chapter. Then the set of export records would be tied directly to the shipment, employment, and earnings performances of firms within a single classification system.

Since the ideal data format does not exist, the alternative is to synchronise as effectively as possible the available information. Data from the provincial accounts and the provincial inter-industry estimates of Statistics Canada are used to identify the changing importance of international and inter-provincial markets for the Alberta economy. These provide an overview of the rising significance of the export sector in total output, as well as showing the importance of international markets relative to inter-provincial and markets within the province itself.

The data used to assess developments in employment and employee earnings are derived from the Statistics Canada data on employment, earnings and hours, classified by Standard Industrial Classification (SIC) codes. Each producer is assigned an SIC number which is determined by product

characteristics.. In the case of those producing joint or multiple products—diversified operations—the assigned code number is determined by the product accounting for the largest share of sales revenue. The existence of joint products presents a problem in aligning SIC and HS classification systems. For example, the set of producers in a specific SIC goods producing class such as ‘machinery and equipment’ does not necessarily coincide with the set of producers whose shipments make up HS 84 exports of machinery and equipment. Differences in subsets, then, rooted in different systems of classification, temper conclusions about the linking of export performance to indicators of industry growth.

OVERVIEW OF THE ALBERTA MERCHANDISE (GOODS) EXPORT SECTOR

Alberta Gross Domestic Product (GDP) estimates of Statistics Canada measured by expenditure composition and at factor cost enable a broad overview of the Alberta merchandise export sector. Expenditure based GDP estimates couples within province spending by households, business enterprises for capital goods, and governments with the demand for Alberta produced products internationally and inter-provincially. GDP estimates at factor cost include payments to the inputs such as labour, capital and land required producing the output of the economy.

Table 2.1 shows for the years since 1988, the size of goods producing industries and the merchandise export sector relative to the total output of the economy. Column (2) of the table reports the percentage of Alberta provincial GDP at factor cost accounted for by goods producing industries. A time trend fitted from 1988 through 1996 (the most recent year of data availability) reveals that the share of GDP in goods producing industries rose over these years. This contrasts with the national experience, where during the same period, the goods producing sector relative to GDP displayed a declining relative importance.

Table 2.1. Goods producing industries, international and inter-provincial exports as a share of Alberta output, 1988-1996 and 1997

Year (1)	SHARE (%) OF GOODS in GDP (2)	Share (%) of international exports GDP (3)	Share (%) of inter- provincial exports in GDP (4)
1988	41.3	19.9	20.8
1989	40.4	19.9	20.8
1990	40.5	22.0	20.0
1991	40.8	22.0	17.4
1992	40.6	25.0	18.3
1993	42.0	25.5	18.5
1994	43.0	27.5	19.3
1995	43.1	30.6	18.6
1996	43.3	34.1	19.8
1997	n.a.	33.6	18.7

Source: CNSIM matrices 02631 and 09023 and Western Centre for Economic Research

The share of expenditure based GDP accounted for by merchandise exports to foreign countries for the period 1988 to 1997 (the latest year of data availability) is shown in Column (3). Foreign country markets as a percentage of GDP rose quite consistently from one fifth (19.9%) in 1988 to one third (33.6%) in 1997. This experience offers strong evidence that export led growth was a major contributor to goods sector expansion and to the growth of the provincial economy. Section I of this Report has linked the dynamic element in the expansion of the merchandise export sector to the absolute and relative growth in shipments to the U. S. economy. A question frequently raised is whether international exports have simply become a substitute for inter-provincial exports. This case cannot be argued strongly in the case of Alberta. Column (4) suggests that the importance of inter-provincial markets, measured by shares, displayed a cyclical pattern over the period. A lower share of inter-provincial shipments accompanied the long recession and weak recovery in the Canadian economy in the early 1990s, and the counter effect of the cyclical recovery revived the inter-provincial share in later years. The table indicates unequivocally the expansion of the export sector as business firms took advantage of the new market opportunities available under the FTA. It also suggests that customer relationships in other Canadian jurisdictions were well maintained.

THE EXPORT RECORD OF SELECTED GOODS PRODUCING SECTORS

Table 2.2 provides information on the changing importance of international market opportunities for a number of goods producing sectors. The basic data is derived from the Statistics Canada CANSIM series on Alberta international and inter-provincial trade flows measured at producer prices. The data source reports the estimated geographic distribution of sales for the Alberta supply of each designated product—within Alberta, inter-provincially, and internationally. International market shares for any individual sector i were defined for any year t as:

$$IMS_{it} = \frac{X_{it}}{S_{it}}$$

where IMS is the market share, X is exports, and S is the available Alberta supply. Table 2.2 reports the annualised trend rate of growth for the primary and manufacturing sectors as a whole, as well as for particular manufacturing sectors. A linear trend was fitted to the annual international market share for each commodity over the period 1988-1996 (most recent year of data availability). Note that the trend lines are fitted from data for the entire period 1988 to 1996. The experience of any sector for shorter time intervals may differ from the annualised rate of growth over the entire period.

Table 2.2. The growth trend of international markets for selected goods producing sectors of the Alberta economy, 1988-1996

SECTOR	Annual % growth in the share of total supply sold internationally
Electrical/Communications products	4.42
Furniture and fixtures	3.15
Machinery and equipment	3.12
Paper and paper products	2.98
Clothing, knitted products	2.11
Meat, fish and dairy products	1.98
Mineral fuels	1.78
Manufactured Goods	1.70
Miscellaneous manufactured products	1.67
Metal fabricated products	1.35
Petroleum and coal products	1.25
Primary Goods	1.00
Lumber and sawmill products	0.83
Feed and other food products	0.61
Chemicals and chemical products	0.30
Printing and publishing	0.14
Primary metals.	-0.20
Beverages	-0.58

Source: CANSIM matrices 4224, 4217, 4222, 4218, 4215, 4209, 4206, 4251, 4228, 4221, 4226, 4250, 4216, 4210, 4227, 4219, 4220, 4211 and Western Centre for Economic Research

Table 2.2 ranks sectors in descending order by their annualised rate of growth in international markets over the period. A trend value of zero means no growth in international market share of total production. A positive trend value means that the growth in the international markets was a dynamic factor, contributing more than its share to the growth in sector output. At the top is electrical and communications products. The figure of 4.42% means that

on average the international market share ratio in that sector rose annually at that rate. The manufacturing sector as a whole displayed a trend annual growth in international market share of 1.70% , indicating the importance of international markets to the growth of this sector.

FURTHER ANALYSIS OF THE MANUFACTURING SECTOR

Table 2.2 reveals that international markets for Alberta manufactured goods in the aggregate, and for the reported SIC sectors, grew relatively between 1988 and 1996. Merchandise export data, summarised in Section I of this Report, also reveal that the following products accounted for more than 30% of the growth in aggregate Alberta merchandise exports between 1988 and 1998. These were electrical/communications equipment, meat, wood products, wood pulp, furniture and fixtures, paper and paperboard, scientific and professional instruments, fertilisers, and plastics. Our Harmonised system export data indicate that with the exception of woodpulp (HS47), the U. S. market share in the case of these products either grew or was extremely significant.

Further light on these and other manufacturing sectors identified by SIC code is reported in Table 2.3. This table reports the trend rate of growth in the estimated constant dollar value of sector shipments from 1988-1998. Manufacturing sectors are ranked in descending order by growth rate.

For many of the sectors at the upper end of the table, including electrical and telecommunications equipment, paper and allied products, machinery and equipment, plastics, transportation equipment, organic chemicals, and wood products, the export market— and in most cases the U. S. market—has been a significant factor in their performance.

These estimates also reveal an increase in the relative importance of durable manufacturing within the sector as a whole. This is indicative of increased depth and breadth within the sector.

BUSINESS SERVICES

The Harmonised System of international trade classification refers only to merchandise trade. However, the FTA is a comprehensive treaty that includes services as well as goods. Business services are a critical component of a knowledge based economy, encompassing highly trained and technically skilled groups of professionals. Business services include engineers, computer analysts, architects, management consultants, lawyers, accountants, and other professional groups.

Table 2.3. The growth trend in the constant dollar value of selected Alberta manufacturing sector shipments, 1988-1996

SECTOR	% per year
Electrical/Communication Equipment	16.22
Paper/allied products	9.90
Machinery and equipment	9.86
Furniture and Fixtures	7.16
Transportation equipment	6.60
Other food products	6.48
Plastics	6.39
Durable Manufacturing--entire sector	6.20
Organic chemical products	5.39
Wood products	5.23
Refinery products	4.81
Fabricated metals	4.34
Non-durable Manufacturing--entire sector	3.98
Non-metallic minerals	3.78
Beverages	3.53
Food products total	2.98
Meat products excluding poultry	2.64
Scientific/professional instr.	1.33
Inorganic chemical products	1.00
Primary metals	-0.56
Printing/publishing	-1.28
Clothing	-2.44

Source: CANSIM and Western Centre for Economic Research

The data on international and inter-provincial shipments by sector (CANSIM Matrix 4239) show that between 1988 and 1996 the international component of total billings of Alberta's business service industry more than doubled from 3.0% to 6.4%. During the same period business services as a share of employment in firms of all sizes rose from 3.9% to 6.9% of total provincial employment, and increased further to 8.0% in 1988. It can be argued that the movement toward a more outward looking business service sector merely mirrored the increased importance of international markets, specifically the American market, in the goods sector of the economy.

AVERAGE WEEKLY EARNINGS

Table 2.4. reports the growth rate in average weekly earnings and employment over the 1988-1998 period for selected SIC sectors, including business services.

Table 2.4. The growth trend in average weekly earnings and employment for selected Alberta sectors, 1988-1998 (including a comparison with the CPI)

SECTOR	Trend rate of growth in average weekly earnings including overtime 1988-1998 (% per year)	Trend rate of growth in employment (% per year)
Other Manufacturing	6.88	-1.34
Business services	5.05	7.65
services incidental to oil and gas	4.86	1.31
logging and forestry	4.53	-2.97
printing and publishing	4.33	0.45
electrical/communic. equipment	4.04	1.61
chemicals	3.84	0.85
paper and allied products	3.82	4.93
wood products	3.81	4.45
clothing	3.70	-2.16
Durable manufacturing -- entire sector	3.55	2.01
machinery	3.31	4.72
Non-durable manufacturing -- entire sector	3.20	1.06
plastics	3.14	4.79
primary metals	3.06	-0.11
crude oil and natural gas	3.05	-2.11
nonmetallic minerals	3.02	1.92
fabricated metals	3.00	1.10
transportation equipment	2.75	3.17
Alberta CPI index	2.55	—
furniture	2.54	5.74
refinery products	2.40	0.72
meat and poultry	2.07	1.87
other food products	1.79	6.35
beverages	1.67	-0.45

Source: CANISM and Western Centre for Economic Research

The data on average weekly earnings covers all employees in establishments of all sizes and includes overtime (CANSIM matrix 4414). For comparative purposes, figures for the durable and nondurable manufacturing groups as a whole, as well as the trend rate of Consumer Price Index inflation in the 1988-98 period of 2.55% is included. Table 2.4. reveals that for virtually all sectors, as well as for the durable and nondurable manufacturing groups (led by other manufacturing which consists almost entirely of scientific and professional equipment), the trend rate of growth in earnings exceeded the rate of inflation.

The trend rate of growth in employment is shown in Column (3) of the table. Most sectors displayed an increasing employment trend during these years, and growth in the durable and nondurable sectors as a whole, like the trend in business services, was positive.

CONCLUSION

The evidence, with due acknowledgement of its less than perfect nature, leads to the conclusion that the FTA has had a positive effect on those sectors of the Alberta economy most directly involved in trade flows. By any standard one applies, the Alberta economy has become more tied into the international economy during the FTA era, and relatively unfettered access to the American market has been central to the transitions that have taken place. Unlike the national experience, where the trend has been a decline in the share of goods production in output, in Alberta the goods share has increased over the 1988-1998 period. While goods production grew relatively, business services were growing more rapidly than other service sectors and more rapidly than aggregate employment. The growing goods production, strongly evident in the manufacturing sector, together with a rapid expansion in the business service sector is evidence of a more sophisticated provincial economy. Further, the changes occurring in the manufacturing and in business services generated increased employment and real increases in earnings. The importance of the access to greater foreign market opportunity in bringing about these positive developments cannot be overemphasized.

SECTION III

EMPLOYMENT VARIABILITY IN ALBERTA: IS THERE MORE STABILITY?

This section of the Report addresses the question of whether the Free Trade Agreement era has been associated with any change in the degree of employment stability in Alberta.

The data used in this Section to consider whether employment stability in Alberta has changed from the era previous to the FTA are from Statistics Canada's monthly labour force survey covering the period from first quarter of 1976 (1976:Q1) to the second quarter of 1998 (1998: Q2). This national household survey of the labour force and employment was chosen because it is the best available continuous record of these variables at the provincial level. Data coverage permits the comparison of employment stability in the FTA period (regarding 1988 as a year of strategic planning by business in advance of treaty commencement) with a prior period of approximately equivalent duration.

BACKGROUND

Employment as a primary determinant of economic welfare and social status is arguably the single most important economic policy variable. The degree of volatility is not a trivial question for either the provincial public or private sectors. In the public sector, for example, it means more stable flows of tax revenues and less risk when making budget estimates. In the private sector, it means a generally more stable environment for human resources management. Effectively, reduced volatility means a lower level of uncertainty for all parts of the economy

A number of recent studies have found that employment stability both in Canada and the United States did not differ measurably in the early 1990s from the prior two decades [Green and Riddell 1996; Diebold, Neumark and Polsky 1994; Heisz 1996]. A further study reported in *Canadian Economic Observer* based upon national data from the Labour Force Survey (LFS) and the Longitudinal Worker File (LWF), has suggested that an ongoing shift of jobs to the service sector altered aggregate job stability [Heitz and Cote 1998]. A study of national labour market conditions confirms this to some extent, but the

question is whether those findings can easily be extrapolated to the experience of individual provinces, and to Alberta in particular. For example, in Alberta, the service sector was 63% of provincial employment in 1976, rose to 72% in the mid-eighties, and has remained in the 71-72% range since then. Because there are large differences between regional economies and between the Western Canadian and the national economy, it is necessary to identify provincial circumstances.

Studies have, in fact, found substantial variation in the stability of employment, income, and population growth between the provinces and, therefore, in the deviation of provincial conditions from the national [Chambers and Percy 1992, Mansell and Percy 1990]. These economic measures demonstrated that the three western most provinces were far and away the least stable. Therefore, though there is evidence of increased national job stability, how does the evidence play in those provinces with the highest historical levels of volatility?

METHODOLOGY

The literature offers no universally accepted method of measuring instability. Some approaches fit trend lines to employment in the respective industrial sectors, taking deviations of observed values from either fitted values or the series mean [Brewer and Moomaw 1985; Conroy 1975; Gruben and Phillips 1989]. Other studies employ stationary time series models to distinguish expected from unexpected variability. Instability is then represented by squared deviations of observed from anticipated changes [Mansell and Percy 1990].

This analysis applies a portfolio variance model. This approach measures regional employment variability based on industrial structure. Portfolio variance, a concept widely used by financial analysts, has two basic parts: variance and covariance. When employment in a given industrial sector fluctuates a good deal, the sector has high employment variance. In common parlance, it is a 'boom-bust' sector. Other things being equal, the higher the employment variance in the industrial sectors making up a provincial economy, the higher the variability in provincial employment.

Provincial employment variability is also determined by whether employment changes in the sectors move in the same or in opposite directions, i.e., by covariance. Should changes in industrial sector employment move in the same direction, the net result is to lower employment stability. Should these changes move in opposite directions, the net effect is to make provincial employment more stable.

In sum, lower levels of variance, and greater evidence of negative covariance (rates of industry sector employment change moving on average in opposite directions) indicates greater stability in provincial employment. When employment in the various sectors of the economy increase or decrease in tandem, this adds to the 'boom bust' character of an economy. When increased employment in some sectors offset decreased employment in others, the economy shows greater stability.

Published monthly employment estimates are available from Statistics Canada for eleven industry sectors: agriculture; non-agricultural primary; utilities; manufacturing; construction; transport, storage and communication; wholesale and retail trade; finance, insurance and real estate (FIRE); community services (health and education); business and personal services; and public administration. Employment portfolio variance was estimated for quarterly natural log differences standardized by the mean quarterly change in each of the 11 sectors.

That is, each of the 121 elements of this matrix consists of a relative covariance of the following type:

$$\sigma_{ij} = \{1/(n-2)\} [(u_{it} - \hat{u}_i)/\hat{u}_i] [(u_{jt} - \hat{u}_j)/\hat{u}_j]$$

where n is the number of observations. The variables u_{it} and u_{jt} are the observed quarterly rates of change in sectors i and j respectively during quarter t . The variables \hat{u}_i and \hat{u}_j are the mean rates of change.

The 121 individual components are summed to derive the total employment portfolio variance as follows:

$$\sigma_P = \sum_j \omega_j \sigma_j^2 + \sum_{i \neq j} \sum_{j \neq i} \omega_i \omega_j \sigma_{ij}$$

where σ^2 represents the employment variance of sector j , σ_{ij} is the covariance of employment between sector i and sector j , and ω_i and ω_j are weights that are equal to the average share of each sector's employment in total employment. Each sector contributes to provincial employment portfolio variance through its own weighted variance and covariance with other sectors. A sector's weight is its share of total employment.

The model does not require decomposition of industry sector log differences in quarterly employment into anticipated and unanticipated change, nor does it require the identification of trend rates of sector employment growth.

RESULTS

The first question addressed is whether the portfolio variance approach yields results about job stability consistent with those reported in *Canadian Economic Observer*. Table 3.1 reports estimated national portfolio variance covering two sub-periods: the first era is from the first quarter of 1976 (1976:Q1) to the fourth quarter of 1987 (1987:Q4) and the second from the first quarter of 1988 (1988:Q1) to the second quarter of 1998 (1998:Q2). National portfolio variance of quarterly employment change in natural log differences (converted to percentages) declined in the second period by approximately 23%, or from 0.03679 to 0.02845. The analysis revealed that the decline in weighted variance was experienced almost equally in the goods and service producing sectors. The results using the methodology adopted here appear consistent with those reported by Statistics Canada in their study of LWF data.

TABLE 3.1. Portfolio variance of national quarterly employment change for two eras: 1976:Q1 to 1987:Q4 and 1988:Q1 to 1998:Q2

Canada	Portfolio variance
Era 1:1976:Q1 to 1987:Q4	0.03679
Era 2: 1988:Q1 to 1988:Q2	0.02845
Era 2 variance as % of Era 1	77.3

Source: Basic data from the Monthly Labour Force Survey

Table 3.2 reports portfolio variance derived from natural log differences of quarterly employment change in the two periods for Alberta. Data are converted to percentages. Alberta, in the earlier period, recorded the highest level of employment variability in the country, followed in order by Saskatchewan and British Columbia. Levels of portfolio variance in Alberta exceeded the national, by 6.5 times (.2377/.03679). In the second period, portfolio variance for Alberta declined markedly both absolutely and relatively. The absolute decline amounted to 42% and the ratio of Alberta to national portfolio variance fell from 6.5 to 4.8. Table 3.2 indicates that eight of eleven sectors, accounting for some 85% of Alberta employment, experienced reduced variance. By far the largest share of the decline in portfolio variance was attributable to this lower variance but a small amount occurred because covariance moved from net positive to net negative in the second era. In fact, eight of eleven sectors displayed negative covariance compared with only three sectors in the first era.

Table 3.2. Portfolio variance of quarterly percent changes in employment: Alberta for each of two eras: 1976:Q1 to 1987:Q4 and 1988:Q1 to 1998:Q2

ERA 1: 1976:Q1 to 1987:Q4	Alberta	
SECTOR*	Variance	Covariance
Agriculture	0.5046	-0.0394
Non-agricultural Primary	0.4989	0.2555
Utilities	1.1006	0.0363
Manufacturing	0.2489	0.2355
Construction	0.4023	0.2458
Transport, Storage, Comm.	0.1806	0.0220
Trade	0.0887	0.0251
FIRE	0.3076	-0.2439
Community Services	0.1251	0.0083
Business and Personal Services	0.1348	0.1219
Public Administration	0.1517	-0.0431
Portfolio (weighted) Variance/Covariance	0.2377	

ERA 2: 1988:Q1 to 1998:Q2	Alberta	
SECTOR*	Variance	Covariance
Agriculture	0.1854	-0.1406
Non-agricultural Primary	0.2046	-0.0888
Utilities	2.0644	-0.4254
Manufacturing	0.1817	-0.0766
Construction	0.1625	-0.0616
Transport, Storage, Comm.	0.2241	0.0103
Trade	0.0593	0.0333
FIRE	0.2377	0.0617
Community Services	0.0661	-0.1128
Business and Personal Services	0.0590	-0.1290
Public Administration	0.2106	-0.2963
Portfolio (weighted) Variance/Covariance	0.1364	

*Sector variance and covariance are unweighted

Source: CANSIM Matrix 3468 and WCER

Table 3.3 reports the contribution of the goods and service sectors to changes in portfolio variance between the two periods. In Alberta, weighted variance/covariance in both sectors declined corresponding to the national experience. In the goods sector, variance fell by one-half, and service sector variance by some 30%. In the first period, variance in the goods sector accounted for just less than 60% of total variance, while in the second, each sector contributed in almost equal shares to a substantially lower portfolio variance.

TABLE 3.3. Contribution of the goods and service sectors to the change in portfolio variance between the two eras: Alberta

Types of variance	1976:Q1to1987:Q4 weighted variance and covariance	1988Q:1to 1998:Q2 weighted variance and covariance	% change
Alberta			
Goods sector variance	0.1387	0.0678	-51.2
Service sector variance	0.0990	0.0686	-30.7
Total variance	0.2377	0.1364	

RESULTS WITH FIXED VS. VARIABLE SECTOR WEIGHTS

In this portfolio variance model the results can be influenced by changes in industrial structure. The weights used in the analyses reported in Tables 3.1 through 3.3 are based upon the industrial structure of employment in the respective eras. Because there were structural changes in employment, the weights differ somewhat between the two eras.

It is helpful to see how changes in variability may result from changes in industrial structure. Table 3.4 reports portfolio variance results when the composition of employment in the second era is assumed to be the same as in the earlier period. The table reveals that using fixed weights in the calculation of portfolio variance changed the results somewhat more for Canada than for Alberta. Weight changes accounted for 16.9% of the decline in variability in the case of Canada and 7.1% for Alberta.

Table 3.4. Difference in portfolio variance percentage with fixed vs. actual employment composition weights in Era 2

	Portfolio variance Era 2 with fixed weights (2)	Portfolio variance Era 2 with actual weights (3)	Difference (2)-(3)	Difference as a % of the inter-period change in variance
Canada	0.02986	0.02845	.00141	16.9%
Alberta	0.1436	0.1364	.0072	7.1%

BETA MEASURES OF VOLATILITY

Table 3.5 reports indexes of variance, covariance and the contribution of the eleven sectors to Alberta employment variability during the two eras. The first set of columns contains a measure of variance, the second set shows a measure of covariance, and the third set contains a measure of a sector's contribution to total employment variability. The variance and covariance indexes express, in ratio form, each sector's variance and covariance relative to aggregate weighted average variance and covariance. In the variance column, for example, the index ratio of 4.73 for the Alberta utilities sector in the first era means that the sector is 4.73 times more volatile than the weighted employment variance of all sectors combined. The covariance index measures the covariance of that sector relative to absolute covariance weighted average for the all sectors. The two beta columns report a weighted average of the variance and covariance measures and indicate the overall contribution of each sector to total employment variability. If beta is equal to 1.0 then the sector is neutral in its effect on total employment, i.e.; it neither raises nor lowers the variance of total employment. A beta greater than 1.0 means that the sector raises total employment variability, while a beta less than 1.0 means that the sector reduces overall variance.

Table 3.5 reveals that high variance in a sector is not, in itself, a contributor to increased volatility. High variance may be offset by strong negative covariance. For example, in the second era in Alberta, a non-agricultural primary industry variance index in excess of 2.00 is offset by negative covariance, effectively reducing the beta value to below unity. Beta values less than 1.0 for both the agriculture and non-agricultural primary sectors are notable in the second era. Similarly betas less than 1.0 appear in manufacturing and in the later era as a result of negative covariance levels. As might be

expected, service sectors generally have the lower betas. There are exceptions: the transportation, storage and communication and the FIRE sectors contributed to Alberta's volatility in the second.

Table 3.5 Indexes of variance, covariance and beta values for Alberta employment sectors 1976:Q1 to 1987:Q4 and 1988:Q1 to 1998:Q2

SECTORS	Index of Variance	Index of Covariance	Beta Value
ERA 1: 1976:Q1 to 1987:Q4			
Agriculture	2.17	-3.11	0.46
Nonagricultural Primary	2.14	2.02	3.17
Utilities	4.73	0.29	4.78
Manufacturing	1.07	1.84	2.03
Construction	1.73	1.94	2.73
Transportation/Storage/Comm.	0.78	0.17	0.85
Trade	0.38	0.20	0.48
Finance, Insurance & Real Estate	1.32	-1.93	0.27
Community Services	0.54	0.07	0.61
Business and Personal Services	0.58	0.96	1.08
Public Administration	0.65	-0.34	0.46
ERA 2: 1988:Q1 to 1998			
Agriculture	1.23	-1.35	0.31
Nonagriculture Primary	1.36	-0.85	0.41
Utilities	13.71	-4.09	11.75
Manufacturing	1.21	-0.74	0.73
Construction	1.08	-0.59	0.70
Transportation/Storage	1.49	0.10	1.63
Trade	0.39	-0.32	0.18
Finance, Insurance & Real Estate	1.58	0.59	2.09
Community Services	0.44	-1.08	-0.33
Business and Personal Services	0.39	-1.24	-0.49
Public Administration	1.40	-2.85	-0.60

Source: WCER

PARSING THE CHANGES IN ALBERTA EMPLOYMENT VARIANCE

In sum, the above analyses show that the decline in Alberta employment variability in the FTA era occurred in both the goods and services sectors and was large. In fact, Alberta recorded a significant decline in volatility both absolutely and relative to national experience. The question then becomes: How do we parse the changes in Alberta employment?

To better understand what has happened in Alberta, we consider specifically the sectors of agriculture, non-agricultural primary, manufacturing, and business and professional services. These four sectors accounted for just under one half of portfolio variance in the first era. That fell to just over one-third (35%) of the much smaller variance in the second period.

- (1) In agriculture, several significant changes have occurred. These include the increased importance of livestock production relative to traditional grains; the increase in oilseed plantings; and the growth in the number of hectares planted in specialty crops such as potatoes, peas and mustard seed. Greater stability in agriculture is a reflection of the differentiated crop and market conditions accompanying these commodities.
- (2) In the non-agricultural primary sector, variance fell by three fifths. Employment in this Alberta sector consists overwhelmingly of energy industry workers (in excess of 90%). The single most important development in the Alberta energy sector is the increased absolute and relative importance of natural gas. The continental market for natural gas opened up with the FTA, so that presently the dollar value of gas exports is at least equal in importance to that of crude oil. This is a welcome change in the energy industry, quite apart from the environmental advantages of gas. The Statistics Canada Raw Material Price Index reveals that the volatility of monthly natural gas prices over the past twenty years is substantially lower—almost two thirds lower—than crude oil prices over the same period. In other words, the diversification has occurred with a less price volatile form of energy.
- (3) Statistics Canada data on exports (from TIERS and the CTA), and on the value of manufacturing shipments and sector employment (Employment, Earnings and Hours) provide insight into important developments in the

Alberta manufacturing sector over the past two decades. Export data is particularly valuable, since it indicates the long term viability of manufacturing activity in a highly competitive marketplace. It is important that this data identify longer-term trends rather than focussing on annual changes that reflect largely cyclical influences on demand conditions. For example, in years of cyclical expansion the share of durable manufacturing tends to increase and that of non-durable manufacturing shipment and employment shares to decrease. Data for aggregate employment and shipments indicate greater diversity within both the non-durable and durable goods sectors of manufacturing. Changes in manufacturing shipments and in employment are summarized for selected sectors in Table 3.6. Increased segment shares are indicative of greater diversification.

Table 3.6. Sectors with consistent increases in their relative shares of manufacturing shipments and/or manufacturing employment since the early 1980s

SECTORS	Manufacturing shipments	Manufacturing employment
Electrical equipment	yes	yes
Machinery	yes	no
Chemicals	yes	no
Pulp and paper	yes	yes
Plastics	no	yes
Transport equipment	yes	yes
Furniture and fixtures	yes	yes
Scientific and professional equipment	yes	yes

Source: CANSIM matrices 9578, 9591, and 4411. Statistics Canada, TIERS/CTA

- (4) In the service sector, the decline in overall variance was some 31%, with the most notable change a fall of one-half in the weighted variance of the business and personal services component. This component comprises, on the personal service side, a wide range of activities from hotel and restaurant services, to amusement and recreational services, to a number of other personal services. As a result, this component is sensitive to the tourist industry and to changes in the level of household spending.

Professional and technical activities dominate the business services, a sector including computer analysts and software writers, accountants,

lawyers, engineers, architects, management consultants, those in personnel and advertising agencies, and other trained specialists. These activities are subject to rather different sets of market demands than personal services.

It is likely that the decline in variance in the second period reflects the changing balance between business services and personal services. In the early eighties, slightly more than three out of four jobs were in personal services. However, business service jobs have grown much more rapidly since the late eighties and now account for over one-third of jobs while the personal service share has fallen from more than three-quarters to less than two-thirds. Thus, a rising share of professionally and technically trained individuals has led to diversification in this sector.

Greater stability in this sector may also result from a much more active pursuit of international business opportunities by many business service enterprises post-1988 than was the case in the earlier period. The widening of their market not only expands, but also reduces the fluctuations in demand encountered by these professionally based enterprises.

- (5) Finally, employment volatility will be reduced when self-employment and paid employment are substitutes. There is a negative relationship, stronger in the second era, between paid and self-employment in Alberta.

SUMMARY AND CONCLUSIONS

Portfolio analysis, a favourite tool of financial analysts and investment counselors, has been used as a criterion to assess changes in employment in the FTA era. Employment is measured by the quarterly rate of change in those industry sectors reported in the Statistics Canada Monthly Labour Force Survey, publicly accessible through the CANSIM data base. The analysis covers two periods: the first from the beginning of 1976 to the final quarter of 1987 and the second from the first quarter of 1988 to the second quarter of 1998. The study compares employment portfolio variance and covariance between the two eras.

The portfolio analysis results show that the absolute value of portfolio variance declined and little of it was caused by structural change. They also show that Alberta's portfolio variance fell relative to a similar measure for

Canada. Variability in both the goods producing and the service sectors declined substantially, with the largest reduction taking place in the goods producing sector. Important factors contributing to reduced volatility in Alberta in the last decade are:

- a more diversified agricultural sector;
- the increased relative importance of natural gas in the non-agricultural primary sector;
- the emergence of new and/or expanding, internationally competitive segments of manufacturing (such as electrical/telecommunications equipment, meat processing, mechanical equipment, furniture and others);
- the rising relative importance of business professional groups in the business and personal services sectors;
- the strong substitutability between paid and self-employment.

The diversification of an economy is achieved neither quickly nor easily. It evolves. The evolution has stronger momentum when the economic and policy environment is supportive. The Free Trade Agreement created a new range of market opportunities for Alberta enterprises. Certainly—absent all else—it facilitated diversification within the energy industry by guaranteeing U. S. market access for natural gas producers. But the FTA did more than this. It also presented to businesses in many sectors a relatively benign environment for acquiring knowledge and experience as exporters—even for an initial venture into exporting. It is clear that many members of the Alberta business community took good advantage of this extraordinarily significant change in trade policy.

SECTION IV

INWARD FOREIGN DIRECT INVESTMENT SINCE THE FREE TRADE AGREEMENT: DATA AND IMPLICATIONS

INTRODUCTION

Direct investment, in contrast to small financial investments referred to as portfolio investment, involves a significant voice in the management of the firm and a continuing interest in the welfare of its workers. Direct investment represents capital that is committed to the long term. Foreign Direct Investment (FDI) in Canada includes foreign capital, technology, management practices and know-how. These firm specific advantages of non-resident investors offer learning opportunities for Canadian firms, managers and employees alike, a potentially significant element in the efforts to raise productivity, i.e., the standard of living in Canada.

This section examines in greater depth some of the key issues concerning inward foreign direct investment in Canada and Alberta since the signing of the FTA. An important goal of U.S. negotiators at the time of the FTA was to ease the flows of US investment into Canada – especially considering the previous restrictions on inward FDI placed under the National Energy Policy (NEP) and the Foreign Investment Review Agency (FIRA). In Canada, debate focused on the impact of U.S. FDI, and whether an increase in trade between the two countries would increase or reduce FDI flows. On the other hand, it was argued that if much of the FDI already in Canada resulted from “tariff-jumping” (i.e., attempting to get around tariff barriers), then a reduction in tariff barriers would result in a reduction in FDI. It was also argued that an increase in trade between the two countries would lead to further integration of the two economies with a resultant increase in FDI. Ten years after signing the agreement, it is now appropriate to re-examine this debate.

A key issue when examining foreign direct investment is the relative lack of data especially when compared to the data available on international trade. Part 2 of this section provides a brief discussion of the available data and the questions that can be examined using this data. Parts 3 and 4 then provide some empirical results concerning both Canada and Alberta. In order to examine in greater depth the impact of FDI on Canada and the issue of “hollowing out” of

industry, part 5 examines some recently published results. Part 6 presents some observations of the FDI process obtained by a small telephone survey. Part 7 of this section provides a general conclusion.

DATA ON FOREIGN DIRECT INVESTMENT IN CANADA (FDIC)

Statistics Canada collects data on FDI into Canada at the national level, with two different “conventions” regarding the definition of direct investment. The major difference between the two data sets pertains to the extent of foreign ownership of real assets in Canada. The first data set measures foreign control, deemed to exist when foreigners own 10% or more of the corporation, while the second measures majority foreign ownership, i.e. when foreigners own 50% or more of the entity. As is apparent from these two definitions, there is no clear-cut percentage of ownership that defines a significant voice in the management of an enterprise. When ownership is dispersed, 10% of the equity may confer such a voice; certainly 50% or more would amount to a controlling interest. Accordingly when a foreign investor owns at least 10% of the equity of an enterprise, foreign direct investment can be assumed to occur. This is the basis for Statistics Canada’s data collection on FDI in the context of arriving at Canada’s “International Investment Position”. According to the Statistics Canada definition, “Direct investment is measured as the total of the equity, long term claims and,...., the short term claims of non-bank enterprises of the direct investor in the enterprise” (Statistics Canada, *Canada’s International Investment Position, 1926-1996, p. 22*). The technical term employed for this concept is FDI into Canada (FDIC).

The second data set is derived from the Corporations and Labour Unions Returns Act (CALURA). Statistics Canada collects data on the assets, income and profits of foreign-controlled enterprises, where foreign control is said to exist when at least 50% of the equity is held by a non-resident investor. The CALURA set is compiled from data reported to Revenue Canada. These two data bases (and concepts of ownership) exist side by side.

Obviously, there will be differences between the FDIC data used for the International Investment Position and the CALURA data based on majority foreign ownership; however, each of the two data sets has its advantages. It should be pointed out, that CALURA-data pertain to the entire foreign controlled corporation, whereas FDIC data cover only the financial capital

(equity, debt) owned by the foreign investor. Thus, the CALURA data for 1996 show foreign controlled assets of non-financial corporations in Canada at a level of C\$351.4 billion. The FDIC data from Canada's International Investment Position indicate non-resident investors' holding of C\$179.5 billion at the end of 1996 (CANSIM D58849).

The following sections use these data sources to provide details on Foreign Direct Investment into Canada (FDIC).

FOREIGN INVESTMENT IN CANADA

This section examines FDI into Canada and the following section attempts to provide some results relevant to the provinces and to Alberta in particular.

Figure 4.1 provides Foreign Direct Investment data from the Statistics Canada database on Canada's International Investment position described above. The data is taken from Canada's Liability position and is measured in current dollars. This data shows that there has been a significant increase in FDIC in the last decade. Furthermore, the growth in FDI into Canada has accelerated since 1993. According to the Statistics Canada Foreign Direct Investment data set there has been a more than 50% increase in FDI into Canada in the five years from 1993 to 1998.

Figure 4.1. FDI into Canada (\$ billions)

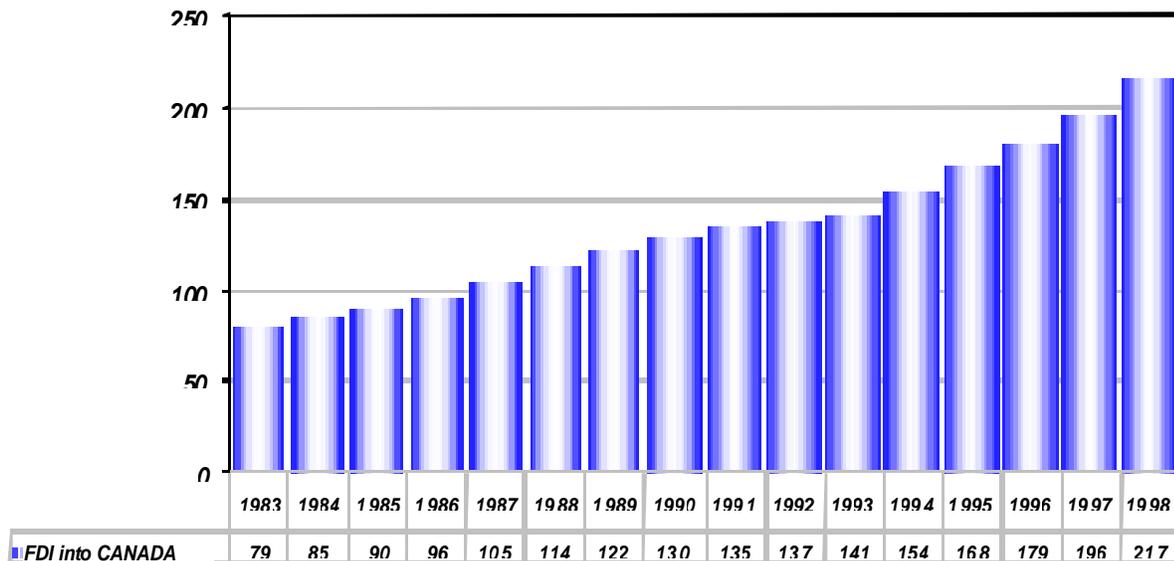
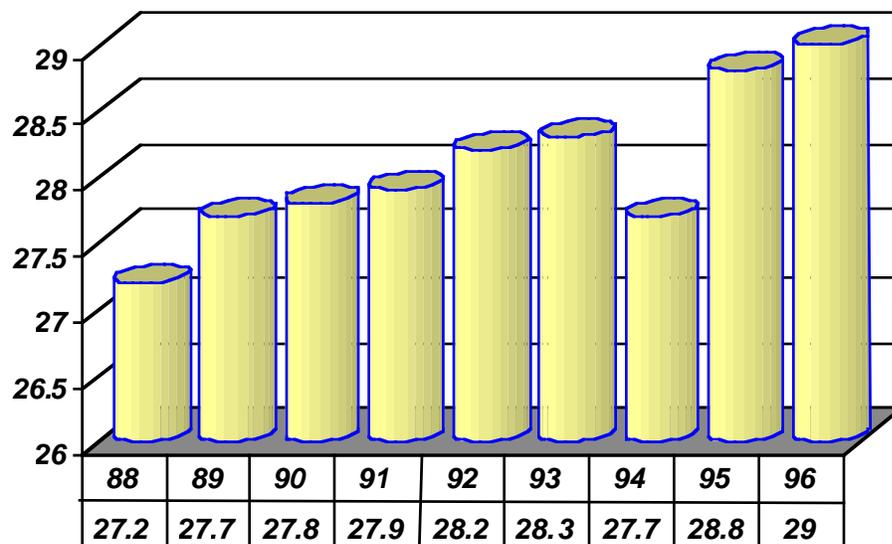


Figure 4.2 examines FDI using the CALURA data set. The CALURA database on majority owned FDI in Canada was described in the section above. These data are available up to and including 1996 and allow some observations on the extent, as well as the performance, of foreign-owned firms in Canada. Figure 4.2 shows the proportion of foreign owned assets in Canada in non-financial industries as percentage of total assets. There is a slight upward trend in the percentage of foreign-owned assets. This trend is consistent with the expectation that Canada would be a more attractive location for foreign firms when access to the North American markets is freer.

Figure 4.2. Foreign-controlled investment as % of total (non-financial industries)



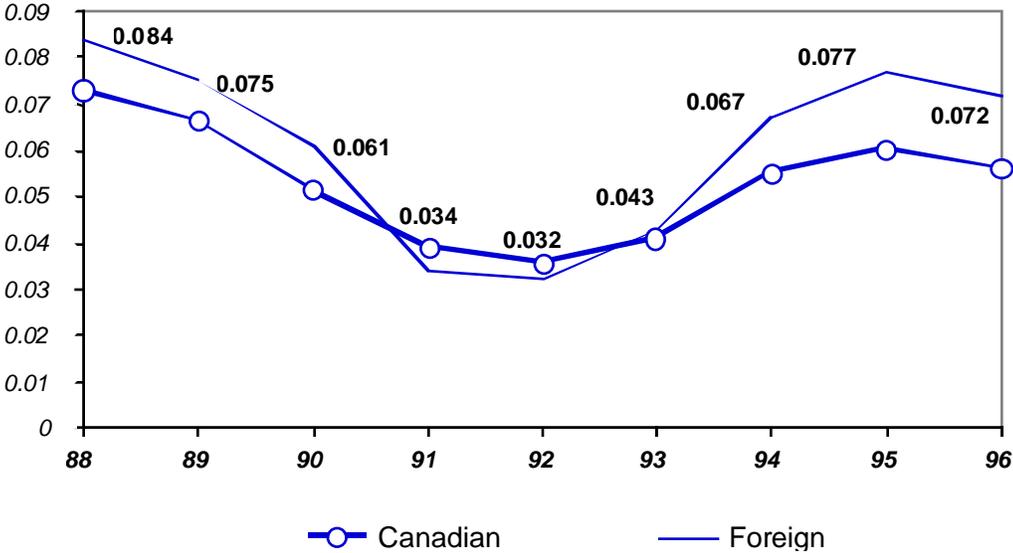
Source: CALURA

Overall growth in assets was 46.5% during the period; foreign-controlled assets increased by 56.3%, whereas Canadian owned assets grew by 42.9%. We therefore conclude that:

- a) Canada did attract foreign investment at a higher rate than Canadian firms were prepared to add to their assets, and
- b) The resulting increase in the foreign-controlled share is minor. At the end of 1996, 29% of the total of \$1.21 trillion in assets were majority foreign owned.

Despite the fact that the non-financial industries as a group cover a wide range of diverse products, the performance of foreign firms gives some indication of their influence on Canada's productivity. Figure 4.3 provides data on operating profitability divided by assets for both Canadian and foreign-controlled firms. Using operating profit relative to total assets as an indicator, we find foreign-owned firms to outperform Canadian firms in seven of the nine years reported here. The two years during which their performance fell below that of Canadian-owned firms were the recession years of 1991 and 1992. Their average profitability by this measure was 0.0605 vs. 0.0529 for Canadian companies. This finding permits the conclusion that foreign firms locating here possess special skills, such as technology, know-how, or management that enables them to outperform Canadian firms. Their operations therefore generate learning opportunities for Canadian firms, training for Canadian workers and tax revenues for governments.

Figure 4.3. Ratio of operating profits to assets: all industries



Source: CALURA

We conclude that even though majority-owned foreign enterprises have increased their share of total non-financial assets in Canada from 27.2 to 29%, where is no alarming loss of control. The small increase in foreign ownership is a natural consequence of FDI growing faster than Canadian investment. The implication at the aggregate level is that there are positive spin offs for Canada from the greater efficiency of inward-FDI. This also implies that FDI is worth protecting once it has been attracted. By analogy, Canadian firms investing abroad can be assumed to be exporting their own special skills. By implication, Canadians should have an interest in participating in global negotiations that protect the flow of Foreign Direct Investment, both into and out of Canada.

FOREIGN DIRECT INVESTMENT BY PROVINCE

This section examines the impact of FDI provincially, particularly in Alberta. Provincial FDI data is very scarce. This section, nevertheless, attempts to provide as much evidence as possible, drawing on the data that is available.

Reliable data on both flows and levels of FDIC by province are in strong demand by various federal and provincial departments as well as the private sector. Statistics Canada has devoted substantial resources to a provincial breakdown of its national FDIC figures but has encountered significant methodological difficulties that prevent publication of its internal estimates. Obviously such figures are politically sensitive, and if they can be questioned on grounds of methodology, a federal agency like Statistics Canada must use particular caution to maintain its reputation.

The process that Statistics Canada went through in its efforts to derive provincial FDI data is documented in an internal document authored by Rosemary Bender of the Balance of Payments Division, entitled "Issues in Provincializing Foreign Direct Investment" (April 1998). This is the best information available on the topic.

A one year pilot project brought together experts from five of Statistics Canada's divisions to assess the obstacles to allocating FDIC to provinces. Such allocation could, in principle, occur along three lines:

- 1) provincial taxable income of corporations
- 2) payroll deduction, by province
- 3) capital expenditure surveys of establishments, by province.

The working party identified three sources of difficulties, which cause inaccuracies in the provincial estimates. The first of these pertains to identifying who performs the FDI. Different corporations of the same enterprise may use the same name in different Statistics Canada surveys.

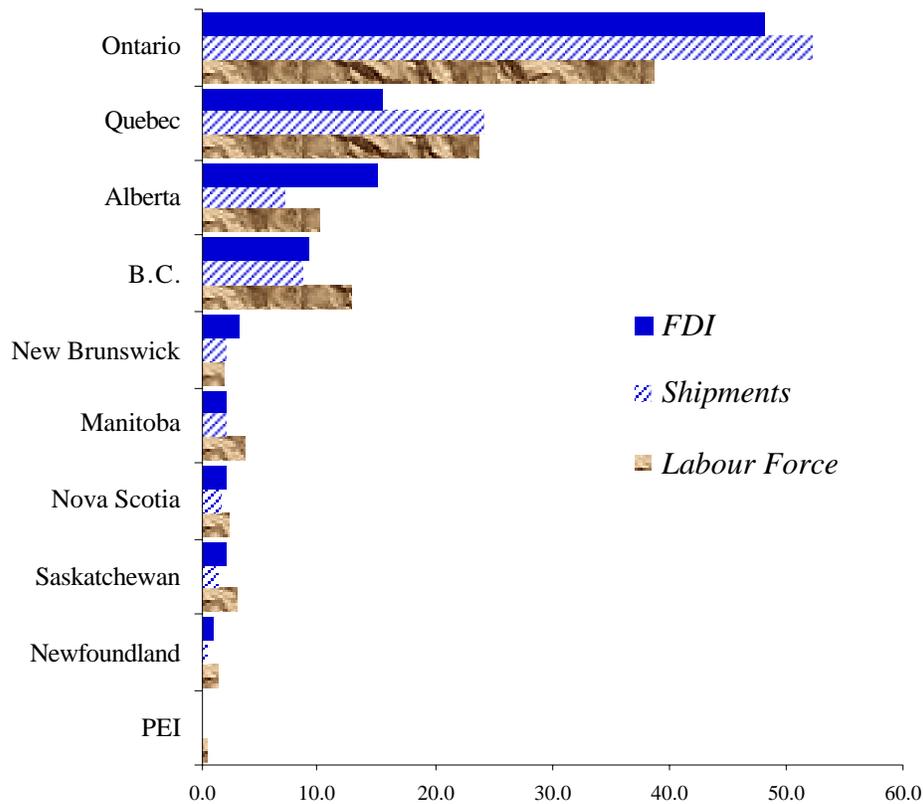
Second, when corporations list and consolidate their subsidiaries for reporting purposes, there are differences between consolidation for balance of payments reporting and the consolidation from the provincial series (1) to (3), above. The third difficulty derives from the fact that there is not necessarily a clear statistical relationship between FDI and income, payroll or capital expenditure. Moreover since taxable income, for example, is based on annual provincial flow data, a corporation's activities during a given year may not be an appropriate basis for allocating FDI.

In carrying out its attempted allocation, Statistics Canada was able to successfully match the CALURA data on taxable income by province and the payroll deduction data to the national FDIC transactions in 90% or more of the cases. Capital expenditure-surveys proved more difficult to allocate. It must also be noted that taxable income reported across provinces is influenced by managerial discretion, accounting practices and provincial tax policies, with particular problems being caused by reported losses.

These limitations (and there are others, too technical to detail in this Report) caused Statistics Canada to refrain from releasing its experimental allocations (which were based on aggregating the reporting firms by province). However, to the outside observer these Statistics Canada allocations of FDIC to provinces exhibit considerable consistency in their results *despite* the difference in allocation source.

In an effort to provide some information, albeit perhaps of imperfect quality, we decided to average the results from the Statistics Canada three data sources to give "guesstimates" of FDIC by province for the one year for which Statistics Canada provided its snapshot, namely 1994. The surprise here is that Alberta appears to attract a significant proportion of the total FDIC - at least when compared to Quebec and British Columbia. It is also useful to compare these provincial FDI data with other indicators of the size of the provincial economies. Figure 4.4 provides data on FDI as well as total labour force and total industrial shipments for each of the 10 provinces.

Figure 4.4. Provincial FDI, shipments and labour force (% of Canadian total)



Source: Statistics Canada, WCER -calculations

These data give an indication of how well an individual province is doing in attracting Foreign Direct Investment. In absolute terms, Ontario attracts a significant proportion of inward FDI, with Alberta and Quebec attracting similar amounts. It is particularly interesting, however, to compare FDI levels with the labour force in each province. Of the four large provinces, Alberta and Ontario both attract a higher proportion of FDI than their proportion of the Canadian labour force. On the other hand both Quebec and British Columbia attract a significantly lower proportion of FDI than their share of the labour force would suggest. There may be many explanations for these differences, but in general the data provide support for the view that FDI tends to be attracted to jurisdictions perceived as business-friendly.

It is also interesting to note that Alberta's share of FDI is considerably higher than its share of total industrial shipments would suggest. The low level of industrial shipments reflects the relatively high degree of natural resource production in Alberta.

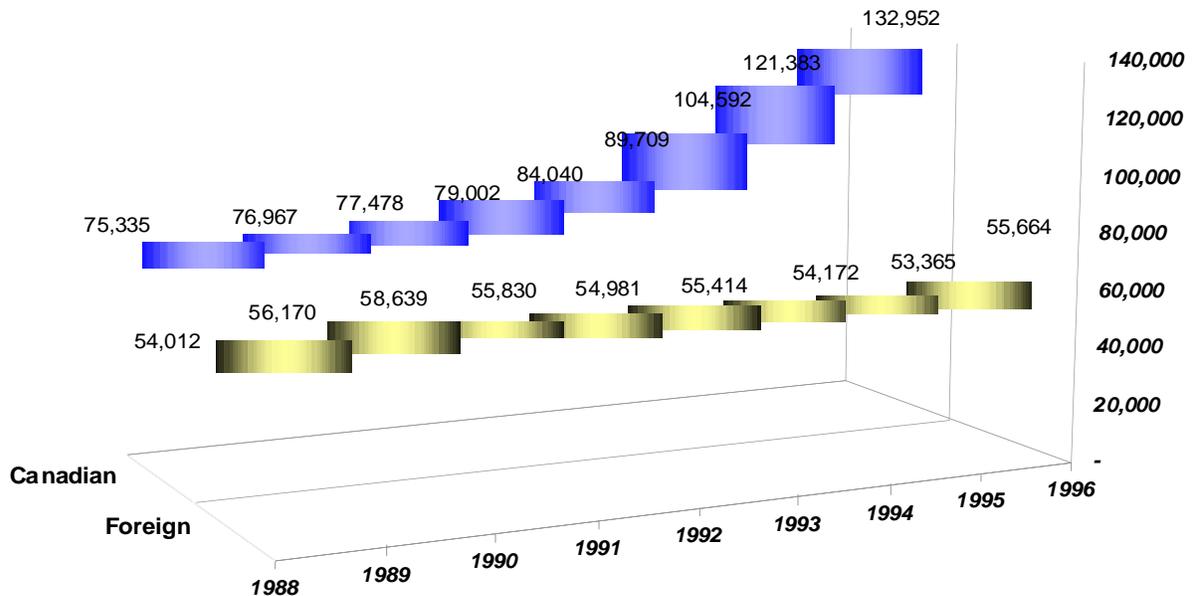
SECTORS OF IMPORTANCE TO ALBERTA – CALURA DATA

The CALURA data described above is a useful and comprehensive data set. However while the CALURA data is broken down into different industrial sectors, it is unfortunately not broken down by province. Nevertheless, in the context of examining the overall impact of FDI on Alberta, it is worthwhile to consider the dynamics of FDI in certain key sectors of importance to Alberta.

Energy

Of particular interest in the Alberta context is the energy sector. Even though this data is Canada-wide, the size of the energy sector in Alberta implies that this data can be useful to Alberta policy makers. Figure 4.5 illustrates the amount of foreign and Canadian controlled assets in the energy sector in Canada. This figure indicates that in the last decade the amount of foreign controlled assets in Canada has tended to remain relatively constant in nominal terms. However, the total amount of Canadian controlled assets in this sector has increased by more than 50% in the years from 1988 to 1996. This is of particular interest in the context of the signing of the Free Trade Agreement (FTA) and the abolition of the National Energy Program (NEP). Much of the emphasis of the NEP concerned the imposition of controls on foreign investment in the energy sector. The abolition of the NEP and the signing of the FTA followed intensive lobbying from the U.S. energy industry to allow easier access for foreign investors into the Canadian energy sector.

Figure 4.5. Total assets: energy sector (\$ millions)



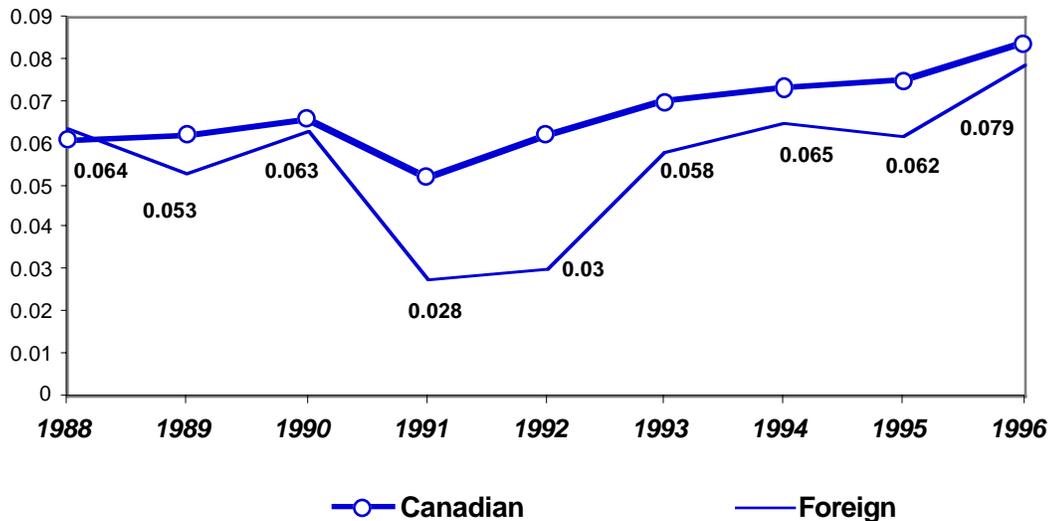
Source: CALURA and WCER

Figure 4.5, however, indicates that the nominal value of foreign-controlled investment in this sector has not increased between 1988 and 1996, while Canadian controlled investment has increased substantially. The implication of these data is that even with the introduction of the FTA, foreign direct investment into the energy sector is less than would have been anticipated a decade ago.

It is difficult to pinpoint a particular reason for why FDI into the energy sector has not increased in real terms since 1988. However, it is useful in this regard to examine the profitability of foreign firms relative to Canadian firms in this sector. Data on the level of operating profits divided by assets for Canadian and foreign firms in the energy sector are provided in Figure 4.6. This data shows that in this sector with the exception of 1988, the profitability of Canadian-controlled firms has been higher than that of foreign-controlled firms. These results are somewhat different from the total non-financial profitability levels shown above in Figure 4.3. In that case, the profitability of foreign-controlled firms tended to be higher than that of Canadian-controlled

firms. The lower profitability for foreign controlled firms in the energy sector could be one reason for the data showing that there has not been a significant increase in FDI into the energy sector in Canada. The question of why Canadian energy firms tend to be more profitable relative to assets is one that clearly requires further research.

Figure 4.6. Ratio of operating profits to assets: energy sector



There are obviously sectors other than energy that are of interest to the Province of Alberta. Brief details of some of these sectors are given below, although once again it should be noted that this sectoral data is Canada-wide. Of the twelve industries covered by the CALURA, those of greatest interest to Alberta besides energy are: wood and paper, chemicals, chemical products and textiles, services (except consumer services), machinery and equipment, and electrical and electronic products. These are reported below in somewhat more detail.

Wood and Paper

Foreign investment in this industry grew much faster than Canadian investment, doubling between 1988 and 1996. As a result, foreign ownership reached 35.7% . The profitability of Canadian firms, on average, is slightly higher than that of foreign-owned firms.

Chemicals, Chemical Products and Textiles

In contrast to the energy industry, FDI in this industry has grown rapidly, accounting for most new investment. As a result, the share of foreign ownership moved from 55.3% to 68.4% during the period of observation. Foreign-owned firms achieved consistently better performance, but of late, Canadian firms appear to be closing the gap.

Services (Excluding Consumer Services)

In this industry FDI doubled, outpacing Canadian investment and resulting in an increase in the foreign ownership share to 16.2%. Canadian assets were consistently deployed more profitably but foreign owned assets are closing the performance gap.

Machinery and Equipment

This industry accounts for less than 3% of the total non-financial industry's asset base. Canadian firms have become as profitable per dollar of assets as foreign-owned firms. The latter have increased their presence to 45%.

Electrical and Electronic Products

In terms of total assets this industry is somewhat larger than machinery and equipment and foreign ownership has reached 50%. Operating profits per dollar invested have been substantially more volatile for the foreign-owned than for the Canadian-owned firms.

In sum, there are two significant conclusions that can be drawn from this section. The first, drawn from Statistics Canada data, is that Alberta has attracted a significant amount of Foreign Direct Investment and as a proportion of the size of the economy has attracted more than B.C. and Quebec. The second conclusion, drawn from the CALURA data base, is that FDI in the energy sector in Canada has not increased rapidly in the last decade, and as a proportion of total investment, foreign investment in this sector has declined. While it must be emphasized that these two conclusions are not strictly comparable (i.e., because the CALURA data is for the energy sector across Canada) it may be possible that much of the FDI being attracted into Alberta is not in the energy sector. This is a topic that requires further research.

TRADE LIBERALIZATION AND FOREIGN DIRECT INVESTMENT: FIRM LEVEL EVIDENCE

While the previous sections have examined aggregate data taken from the CALURA and Statistics Canada data bases, this section reports on recent research of FDI in Canada, which uses data at the level of the firm.

During the negotiation of the FTA some Canadians expressed the fear that trade liberalization would lead to a “hollowing-out” of Canadian affiliates of U.S. multinational corporations (MNC’s), and that Canada would become a ‘warehouse-economy’ (i.e. if not shut down altogether, Canadian affiliates would be reduced to distributing the products of the larger, more efficient U.S. plants). Economic theory has no clear prediction regarding the effects of trade liberalization on direct investment, therefore, it is appropriate to ascertain empirically whether the data show that trade liberalization has had this “hollowing-out” effect.

Methodologically, this is not an easy task inasmuch as it requires data at the firm level, such as employment, plant and equipment, and their total assets, for a sufficiently large number of Canadian affiliates of U.S. companies to have statistical validity. Typically such data are proprietary. In addition, the changes in employment, plant and equipment, and total assets must be clearly attributable to trade liberalization. The influence of other factors, at the firm level and in the broader business environment, as well as a general trend have to be separated from the effects of tariff reductions.

Not surprisingly, the literature, until very recently, was unable to overcome these data hurdles, with the result that conclusive findings had not emerged. For example, Caves (1990) found that tariff levels and employment by U.S. affiliates in Canada were positively related, which would imply that tariff reductions lead to the erosion of employment by affiliates. On the other hand, McFetridge (1989) could not find support for the hypothesis that tariff reductions would result in the export of jobs.

The recent study by Feinberg, Keane and Bognanno (1998), however, provides answers that had been lacking to date. It is appropriate to report the key attributes and findings of this study, as it must be viewed as the most comprehensive research effort on this topic to date. The data employed cover the period 1983 to 1992. A confidentiality agreement with the U.S. Government

allowed these researchers to assemble a data set on 701 U.S. multinationals with Canadian affiliates. These firms represented fifty manufacturing industries (where tariff reductions can be assumed to matter for investment decisions). Data on employment, property, plant or equipment (PPE) and total assets of the Canadian affiliates were available, on average, for four years, so that a total of 2881 firm-year observations formed the basis for separating the effects of tariff reductions from other firm-specific and macro-economic influences, such as interest rates, Canadian - U.S. manufacturing wage differentials, transportation costs, and inflation. 71% of these affiliates had fewer than 400 employees and 70% had fewer than \$30 million in total assets.

Taking considerable pains to avoid methodological pitfalls (e.g., heteroskedasticity) the authors divided the key variables by a measure of firm size (the sum of parent and affiliate sales averaged over the sample period) and related them to the tariff rates in the U.S. and Canada.

There are several important insights that are derived from the data:

1. PPE and total assets: Consistently, and with a high degree of statistical significance, it is found that lower Canadian tariffs are associated with HIGHER levels of capital investments by the U.S. parents in their Canadian affiliates.
2. Employment of Canadian affiliate: Consistently and with a high degree of statistical significance INCREASING employment in the Canadian affiliate is associated with lower Canadian tariffs.
3. Employment of parent company in U.S.: It could not be corroborated that tariff reduction in Canada led to higher capital investment and employment in the U.S. parent company. A 1% decrease in the Canadian tariff led to a 2% DECREASE in parent assets and a 2.9% DECREASE in parent employment.

These three findings indicate that Canada has not been "hollowed-out".

4. Firm and industry variation of response: While the above results hold, on average, for the 701 parent-affiliate pairs, there is the question of whether they also hold at the firm and industry level. Individual firms within a given industry showed very different responses to the lower tariffs, whereas all 50 industries in the sample expanded affiliate employment and assets in the face of lower Canadian tariffs. Thus it is firms within an

industry that respond differently, depending on unobserved characteristics, such as their technology.

Even in an industry that was expected to be hard hit by trade liberalization, namely furniture and fixtures, every firm in the sample showed that increased employment was associated with lower Canadian tariffs. By contrast, in an industry considered a Canadian competitive strength, industrial chemicals, there were a few affiliates that reduced employment with trade liberalization.

For policy-makers and social science researchers two implications derive from the research on FDI in Canada in the wake of the trade liberalization between 1983 and 1992, a period during which average tariffs dropped from nearly 8% to 3% in Canada and from 4% to less than 1.5% in the U.S.

- a) For 50 manufacturing industries and 701 Canadian affiliates there was a statistically secure relationship between tariff-reduction in Canada and employment or capital investment. This relationship, after controlling for other factors, associated lower tariffs with more employment and more asset deployment.
- b) There were a few - surprisingly few - cases where, at the level of the firm, employment and assets were reduced as tariffs in Canada declined. At the industry level, not even a single one of the 50 industries represented in the sample showed a decline in employment assets.

This implies that government policies shielding particular industries from the effects of trade liberalization may be misguided. It also suggests that one can expect opponents of trade liberalization to ignore the overall evidence of higher U.S. FDI in Canadian affiliates and point to the few exceptions at the level of a few individual firms.

The data used in the Feinberg, *et al.*, study extended only to 1992. Access had been obtained to confidential data because the U.S. Government, too, was interested in this important issue. The resultant findings are the best and most detailed available and have gone through a rigorous evaluation by experts in the field. They should serve as compelling evidence that trade liberalization stimulates economic growth.

In conclusion, it is interesting to note a comment by the authors of this study regarding the impact of trade liberalization on productivity. "...Corporate executives at MNC affiliates in Canada...were interviewed as part of this study. One talked about the superior productivity his company was able to achieve at its Canadian facilities by installing high-performance work systems in which worker participation, speed, and flexibility more than compensated for smaller Canadian plant sizes. Rather than shut down smaller Canadian plants when trade was liberalized, his company developed new production technologies that enabled it to achieve high productivity in small plants - even in an industry with important scale economies." (Feinberg, Keane and Bognanno, 1998, p. 773)

TELEPHONE SURVEY ON FDI IN ALBERTA

In an effort to adduce some direct evidence on the climate for and activity levels of FDI in Alberta (and Western Canada), an ad hoc telephone survey was conducted. The strategy consisted of calling the key Consular representatives in Edmonton and Calgary (U.S., Japan, Germany, U.K., France and Italy) for information and sources of information on FDI from their respective home countries. In addition, Economic Development Edmonton, Alberta Economic Development, and Trade and Industry Canada's Trade Commissioner Service were approached. The following questions were asked:

1. Which companies are active as foreign direct investors in Western Canada/Alberta?
2. Which sectors/industries are particularly active?
3. What attracts FDI to Alberta/Western Canada?
4. Why do companies choose FDI over alternatives such as licensing or exports?
5. What trends in FDI are being observed with respect to Alberta and Western Canada relative to central Canada?
6. What, if any, obstacles appear to exist to FDI?

Unfortunately, vacations, retreats and other reasons limited the responses. Thus key personnel at some consulates were unavailable. Notwithstanding these response problems, the following picture emerged from the survey:

- It is difficult to ascertain FDI at the provincial level. Surveys regarding FDI are usually sent to the company's Canadian head-office and the provincial share may not be accurately attributable (see also earlier section). Alberta Economic Development (AED) maintains an 'Inventory of Major Alberta Projects' (website: www.gov.ab.ca/edt/library/imap/mpgetem.cfm) by location, industry, cost, and company name. However, this list does not distinguish between domestic and foreign investors, nor is it necessarily complete. A detailed survey of the companies on this list would have to be done to separate out foreign investors.
- In the view of one Trade Commissioner, the most active sectors are oil and gas, forestry, telecommunications, and software. A scan of the AED 'Inventory of Major Alberta Investment Projects' in the oil and gas sectors (March 99) shows the following planned or initiated expenditures for the next two years (*not* including petrochemical projects), reported in Table 4.1.

Table 4.1. Planned or initiated expenditures of investors for Alberta oil & gas projects (\$ millions)

Company/Investor	Value of the Investment
Amoco Canada	120
Amoco Canada	500
Canadian Occidental Petroleum	66
Imperial Oil	520
Imperial Oil and Amoco Canada	250
Japan-Canada Oilsands	174
Koch Exploration Canada	200
Koch Oil Co. Ltd.	1,040
Mobil Oil Canada Ltd.	2,600
Shell Canada	3,240

Source: Alberta Economic Development

In the software sector, the IT company VARIETY is moving its service centre to Calgary from the U.S., and software giant INTUIT is moving significant activities to Alberta from California. In the telecommunications sector, HARRIS CANADA is spending \$61 million on an overhaul of its wireless facility in Calgary.

- The FDI attracting factors are said to be the knowledge base and low labour cost in the case of telecom and software, and the availability of resources in

the case of the petroleum and forestry industries. The most significant source countries are reportedly the U.S., U.K., France and Japan.

- FDI is said to be preferred over possible alternatives because a physical presence in Canada is deemed important and close proximity to customers or suppliers is essential. In the resources sector the availability of the raw material is the driving force for FDI.
- Information regarding FDI in other parts of Canada did not emerge from the survey. There was a feeling that Alberta and Ontario were particularly successful in attracting FDI. Industry Canada, pursuant to the Investment Canada Act, publishes data on foreign acquisitions/takeovers of Canadian companies (<http://investcan.ic.gc.ca>). The acquirer, name of the acquired company and type of business are given. A scan of the May 1999 list of notifications to Industry Canada result in the following geographic breakdown of acquired companies by head office:

Ontario	42
Quebec	10
Alberta	8
British Columbia	7
New Brunswick	1

Notification of new businesses by foreign direct investors for May 1999 were distributed over the provinces as follows:

Ontario	14
British Columbia	2

It is worth keeping in mind that one obstacle to FDI in Canada is the review of takeovers by Investment Canada. The threshold for such reviews for 1999 is any takeover of a Canadian business valued at more than \$184 million Canadian (provided the investor is from a WTO member country). Indirect acquisitions are not reviewable but still subject to notification to Industry Canada. In some policy sectors (uranium, financial services, transportation services, cultural business) reviews are applicable to direct acquisition of more than \$5 million and indirect acquisitions of more than \$50 million in asset value.

Overall, the limited information gleaned from this telephone survey and website search essentially confirms the overall picture described earlier.

While provincial data are difficult to obtain, indications are that Alberta receives proportionately more FDI than most other provinces, particularly in the energy sector.

CONCLUSION

The key conclusion that can be drawn from this section is that the concerns over Foreign Direct Investment that were expressed at the time of the Free Trade negotiations, have on the whole proved to be unfounded. Foreign Direct Investment has been beneficial for both Canada and Alberta.

An important policy issue that remains, however, is to ensure that suitable regulations are in place to encourage world wide flows of FDI. While the NAFTA agreement provides a very valuable template for an international agreement on investment, it has not been possible to extend such an agreement to all of the WTO countries. The evidence provided here on the impact of FDI on Canada and Alberta since the introduction of the FTA and NAFTA indicates that there would be additional benefits to both Canada and Alberta if an international agreement on investment could be negotiated.

SECTION V: ASSESSING THE IMPACT OF TARIFF REDUCTIONS UNDER THE FTA ON ALBERTA HOUSEHOLDS

The previous sections of this Report have considered the impact of the FTA on the production side of the economy. They have dealt with export values, the response of sectoral output and employment to trade opportunities, changes in employment variability, and FDI flows. But there is also a consumption side to the economy and a well rounded assessment of the FTA must give consideration to the benefits accruing to Alberta households from the ten year phasing out of tariffs on goods of U. S. origin. Retail prices lower than they would have been in the absence of the FTA effectively increase real household income. How significant for Alberta household incomes were reduced retail prices and on what types of expenditures were they most likely to be found?

There are neither simple nor direct measures—such as pre-existing surveys of retailers—that generate estimates of the effect of tariff reductions on retail prices. It would be most advantageous if these existed, for they would provide important evidence of price impacts from businesses catering to consumers. In the absence of this clear evidence, estimates of the household effects of FTA tariff elimination require the assembly, reconciliation and assessment of information obtained from a variety of sources. One needs to know the number of Alberta households, their annual incomes and the allocation between expenditures on goods and services and savings; one needs to identify the tariff schedules most closely applicable to categories of household expenditures on goods; one requires a model of pricing that addresses the role of imports in retail price determination. The latter is especially important since household demand for many goods is met from some combination of domestic production and imports. Further, because Canadian households are a very small proportion of world households, changes in the proportion of Canadian, let alone Alberta consumer demand, satisfied by imports will have a negligible effect, if any, on foreign supplier price.

Canada imports many end products from the United States. They flow through channels of distribution to retailers and then to households. Many of

these, but not all, are consumed directly by households. Other imports of end products, such as equipment for new housing construction, or machinery and equipment for Canadian producers have an indirect impact on households. Still other end products, such as computer hardware and software, carpeting, and furnishings are purchased by private business firms and by governments. They affect cost levels and a phasing down of tariffs to zero can be expected to lower unit costs of production from what they would have been under a tariff regime. In the Report, estimates of the savings from tariff elimination under the FTA will be limited to the estimation of benefits to end products purchased by households through retail channels. The estimates do not take into account, for example, the effect of tariff elimination on new housing costs, or the effect on manufacturers' or service providers' prices as a result of lower capital equipment costs. However, to estimate direct impacts from the data, allowance must be made for non-household end product import demands.

HOUSEHOLD EXPENDITURES

Data on household expenditures are found in the detailed Statistics Canada surveys of household expenditures. These surveys, which determine the weighting structure found in the Consumer Price Index, collect data from a sample of households. Households in the sample are required to maintain a record of all expenditures on hundreds of goods and services, including outlays for taxes and savings, during the survey year. In making estimates we have relied on the 1996 survey.

Household expenditure data is reported in the form of 'average expenditure per household'. For any item, this is the quantity purchased multiplied by the retail price divided by the number of households in the survey. For example, in 1996 the survey data indicate that the average expenditure per household for the category 'refrigerators and refrigerator-freezers' was \$55. Average expenditure per item is rounded to the nearest dollar. The number of households in Canada in that year was estimated to be 10.387 million, so that total expenditure at retail prices on these products in 1996 amounted to \$571.285 million.

The major categories of expenditures for current consumption in the survey are: Food; Shelter; Household Operation; Household Furnishings and

Equipment; Clothing; Transportation; Health Care; Personal Care; Recreation; Education; Tobacco Products and Alcoholic Beverages; Miscellaneous Expenses (e.g. interest on personal loans, and gambling expenses).

Goods in the household operation, household furnishings and equipment, transportation, personal care, and recreation categories make up the core of potential FTA generated tariff savings to the household. A description of the range of items likely to be impacted from FTA tariff reduction can be offered. The household operation component, for example, includes a wide range of import content expenditures from the replacement of fixtures and equipment to household cleaning supplies to power lawn mowers. Household furnishings include many tariff impacted purchases from furniture to appliances, such as washing machines and clothes dryers, to home and workshop tools and equipment. The transportation category includes items such as automobile radios and tape decks, tires, and batteries. Personal care includes outlays on items such as razors and razor blades, skin creams, hair care products and disposable diapers. Recreational expenditures include items ranging from golf, fishing, and home exercise equipment to computer equipment and supplies to motorcycles, motor homes and outdoor picnic and camping equipment.

The household spending data employed in this analysis come from Table 17 of Statistics Canada's publication *Survey of Family Expenditures in Canada 1996*.

IMPORTS AND TARIFF SCHEDULES

Each of the scores of individual items relevant to the estimation of household savings from the FTA must, in turn, be linked to the appropriate category of imports as the a basis for establishing how significant imports may have been in the total supply available to consumers. Imports, as previously explained are classified under the Harmonised System (HS). To link household spending on end goods to imports of these products it is necessary to use HS data at the 6-8 digit level.

Import data will generally be measured at the landed cost, or the cost to the Canadian importer of the goods. Hence import data is reported at landed cost, while household expenditure data is measured at retail price. Import data for

the years 1988 to 1993 was drawn from Statistics Canada's TIERS data base and for 1994 through 1998 from its CTA data base.

The tariff is levied on the landed cost of the good to the importer and becomes part of the suppliers' cost of goods. Import data must be matched as closely as possible to an appropriate tariff category in the Harmonised System. Applicable Canadian tariff schedules prior to 1994 were set by the Tokyo Round and for 1994 and succeeding years by the Uruguay Round. Tariff data used in the analysis comes from the tariff schedule of Canada segment of World Trade Organization data base. The scheduled tariffs under the FTA were also matched to those in the Canadian tariff schedule. There is not always a well defined match so that, in some instances, where there were differences in what appeared to be applicable rates, an average of relevant tariff rates was employed. The choice of an average was judged more realistic than choosing either the lower or the upper limit of applicable rates.

A MODEL OF RETAIL PRICING

To estimate the effect of tariff reduction on products purchased by the household it is necessary to know the role of U.S. imports in retail price setting. At one extreme, the sole impact would be reduced prices for U. S. imports with no competitive effects on the pricing of domestically produced alternatives, or on the retail prices posted for other imports. In effect, this approach would provide a lower bound to estimated household benefits from the FTA. At the other extreme would be the case where FTA tariff reduction completely dominated retail prices through equivalent reductions in all affected items irrespective of geographic origin. Effectively, this provides an upper bound to the household benefits from the FTA.

There are several issues involved in developing a model of retail prices in an economy like Canada's, which in terms of household demand is a small part of the international economy.

1. In the case of many end products, domestically produced supply came from the branch plants of American corporations. Under the FTA, multinational enterprises in rationalising their manufacturing activities may have given Canadian plants an international product mandate for a more limited range of products to gain economies of scale, or, in other instances, there were

branch plant closures and Canadian demand serviced from U. S. plants. In these circumstances, the tariff elimination would be reflected in lower average retail prices for the end products in question.

2. Household preferences are formed not simply by price alone, but include the perception that desirable features or attributes are associated with one type of product. For example, imports of end products from countries other than the U. S. can be perceived to possess different attributes not only from American but from domestically produced competitive products as well. This makes the market pricing of end products such as, for example, compact disc players, considerably different from the pricing of raw materials such as crude oil, or many intermediate products such as sawn lumber or aluminum ingots. Thus, NAFTA tariff reduction on products of American origin may lead other producers to respond not by competitive price reductions but rather by enhanced product features. Where this is the case, there will be a selective rather than a general effect on retail prices.
3. Mark-up pricing is characteristic of end product markets. Mark-up pricing is based on average unit cost plus a percentage mark-up applied to average unit cost:

$$\text{Price} = \text{Average unit cost} + X\%(\text{Average unit cost})$$

This form of pricing combines cost to the seller with market demand elasticity. With regard to average unit cost, because Canadian households are such a small proportion of households in the developed world, unit cost levels for internationally traded goods will be unaffected by changes in Canadian demand. The amount of the mark-up, X, will vary from product to product depending on demand elasticity and localised competitive conditions.

5. In the highly competitive retail environment that exists in Alberta, savings from tariff reduction will be passed along to the consumer.

These considerations indicate that in estimating the dollar value of household savings the tariff is part of the 'cost of goods sold' and subject to a competitive mark-up in setting the retail price.

ESTIMATION OF HOUSEHOLD SAVINGS UNDER THE ABOVE CONDITIONS

The conditions described suggest the unsuitability of a single estimate of savings to households from FTA tariff reductions. The tables that follow offer a range within which potential savings could be expected to fall. For a lower bound estimate of the monetary benefits to Alberta households from tariff reductions under the FTA, an average mark-up of 25% will be assumed with the savings from reduced tariffs strictly confined to U. S. origin end goods. These calculations are based on the estimated share of these end product imports of U. S. origin purchased by households. The upper bound estimate is calculated under the condition that the market impact of the reduced tariff on U. S. imports of end goods had a somewhat broader effect on retail prices.

Estimation procedures are outlined in Appendix 1(a) and 1(b).

LOWER BOUND ESTIMATE

Table 5.1 provides a lower bound estimate of the savings to Alberta households from the FTA over the decade from 1989-1998. Per household savings are based on the number of Alberta households in 1998 and assume that expenditures replicate those in the survey year 1996.

Over the 1989-98 period, the lower bound estimate of FTA generated savings amounted to \$2,240 million in constant 1998 dollars. This estimate, which is exclusive of household expenditures on alcohol and tobacco, amounts to savings of approximately \$2,113 per household over the 10 year period.

Table 5.1. Lower bound estimate of savings to Alberta households from FTA tariff reductions by expenditure category over the decade 1989-98 (\$ millions, in 1998 dollars)

Category	Savings	Share
Clothing	193.3	8.6%
Furnishings and Household Appliances	415.7	18.6%
Interior & Exterior Maintenance	41.7	1.9%
Telephones & Electrical Systems	14.3	0.6%
Mechanical Systems, Heating & Air Conditioning	29.5	1.3%
Operation of Automobiles	214.7	9.6%
Automobiles and Automotive Accessories	846.6	37.8%
Household Supplies (including Pet Expenses)	146.3	6.5%
Health Care	7.7	0.3%
Personal Care	68.4	3.1%
Recreational Equipment	69.4	3.1%
Audio & Video Equipment	60.0	2.7%
Reading & Educational Materials	23.8	1.1%
Recreational Vehicles	109.0	4.9%
Total Savings	2,240.4	

Source: WCER. Basic data from TIERS; CTA; Statistics Canada 'Family Expenditure Survey' (62-55-XPB); 'Household Facilities by Income and Other Characteristics' (13-218); 'The Results of the Uruguay Round' WTO, CD ROM 1996 ISBN 92-870-0145-6

Savings to households are strongest in automobile and automotive accessories, and furnishings and household appliances. Together these categories account for more than one half of the savings. Savings exceed \$100 million 1998 dollars in the other categories of automobile operation, clothing, household supplies and recreational vehicles. The schedule of tariff elimination under the FTA resulted in much larger benefits in the last than in the first five years of the decade, as illustrated in Figure 5.1 (below), showing the annual distribution of household savings.

UPPER BOUND ESTIMATE

The upper bound estimate is conditional on the FTA tariff reduction having a broader influence on retail prices. In this case, prices of other similar items whether produced domestically or imported from other countries, respond in some degree to the lower price of American imports. In certain instances, where the market is completely dominated by competition between domestic product and U. S. imports, the tariff reduction is likely to be fully passed through to retail prices. In other end products, such as clothing and footwear, where American imports are a very small segment of the market, the price effects of the FTA tariff reduction is likely to be confined to U. S. origin goods rather than being diffused more widely.

Table 5.2. Upper bound estimate of household savings from FTA tariff reductions by expenditure category over the decade 1989-1998 (\$ millions, in 1998 dollars)

Category	Savings	Share
Clothing	240.0	7.1%
Furnishings and Household Appliances	704.1	20.7%
Interior & Exterior Maintenance	106.6	3.1%
Telephones & Electrical Systems	18.7	0.5%
Mechanical Systems, Heating & Air Conditioning	46.8	1.4%
Operation of Automobiles	241.4	7.1%
Automobiles and Automotive Accessories	1,119.3	32.9%
Household Supplies (including Pet Expenses)	228.8	6.7%
Health Care	40.0	1.2%
Personal Care	242.7	7.1%
Recreational Equipment	144.5	4.2%
Audio & Video Equipment	103.2	3.0%
Reading & Educational Materials	28.0	0.8%
Recreational Vehicles	137.2	4.0%
Total Savings 1988-98	3,401.2	

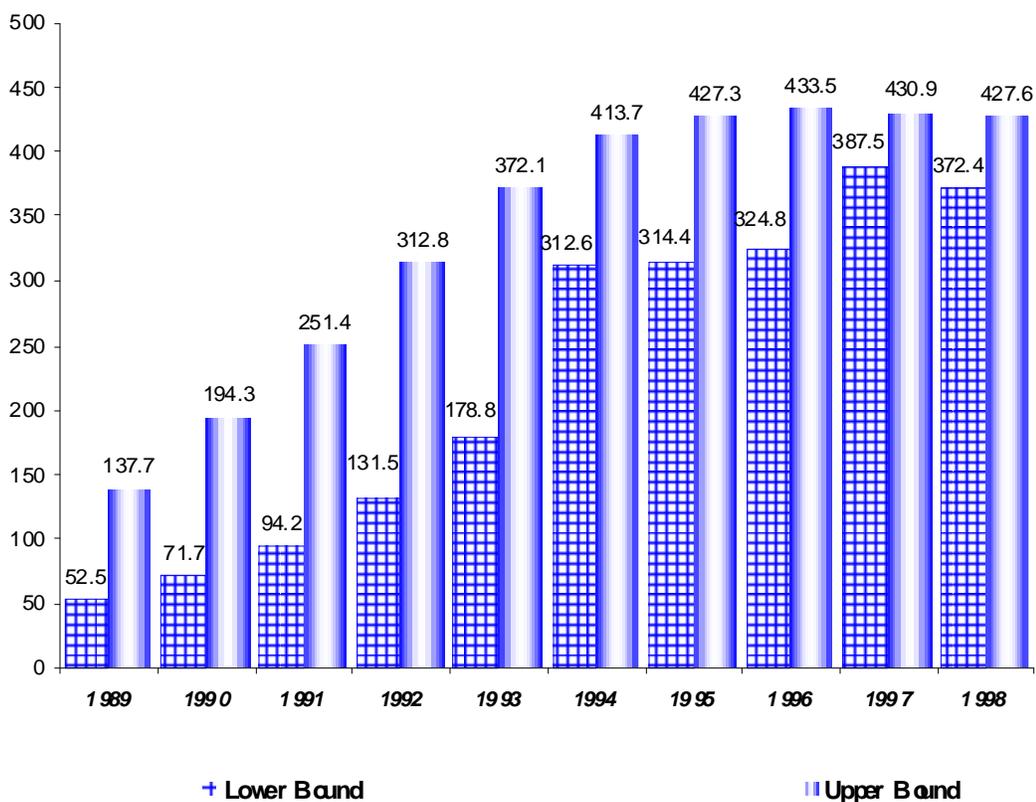
Source: WCER Basic data from:Source: WCER. Basic data from TIERS; CTA; Statistics Canada 'Family Expenditure Survey' (62-55-XPB); 'Household Facilities by Income and Other Characteristics' (13-218); 'The Results of the Uruguay Round' WTO, CD ROM 1996 ISBN 92-870-0145-6

Table 5.2 reveals that over the decade upper bound household savings amounted to \$3,401 million in 1998 dollars. Upper bound savings per household

are estimated at \$3,208. Automobile and automotive accessories and household furnishings and appliances dominate the results, as in the lower bound estimate.

A profile of annual estimated lower and upper bound savings to Alberta households from the FTA over the decade is shown in Figure 5.1. The figure reveals that savings in the last five years contributed the most to decade totals. In the case of the lower bound, savings in the latter five years were almost three times as great, while in the case of the upper bound, savings were almost twice those of the earlier years.

Figure 5.1. Annual lower and upper bound savings to Alberta households from FTA tariff reductions over the decade of 1989-1998 (\$ millions, in 1998 dollars)



SUMMARY AND CONCLUSIONS

In order to develop estimates of the savings to households from tariff reductions under the FTA, it is necessary to combine data sets on household expenditures, imports and WTO and FTA tariff schedules, where the classifications have some overlap but are far from congruent. The estimates offered in Tables 5.1 and 5.2 are built up from itemised household expenditures linked to import and tariff schedules at the 6 to 8 digit level of the Harmonised System. Substantial judgement had to be exercised in creating these linkages. A single estimate of tariff savings in these circumstances would have been inappropriate. Rather the Report opts for lower and upper bound estimates of savings.

These estimates suggest that the aggregate savings to Alberta households over the 1989-1998 decade on those market expenditures contained in the Statistics Canada household expenditure survey range from a lower bound of \$2,240 million to an upper bound of \$3,401 million in 1998 dollars. Per household savings based on the number of 1998 Alberta households are estimated to be within the range of \$2,100 to \$3,200. On an annual basis, savings in the last five years substantially exceed those in the earlier period.

APPENDIX 1(A)

In constructing Table 5.1, the lower bound estimate of tariff savings to households from the FTA, the following procedure was followed:

1. End product purchases in the *Survey of Family Expenditures in Canada 1996* were linked to comparable end product imports at the 6 to 8 digit Harmonised System classifications.
2. Business and governments as well as households purchase numerous imported end products. To separate household from non-household demand, a mark-up was applied to import values and the result compared with reported household expenditures for the item. Where marked up import values for the item exceeded aggregate household expenditures on the linked item, allowance was made for non-household demand.
3. The applicable Canadian tariff under the Tokyo Round (1989-1994) and the Uruguay Round (post-1994) and the comparable schedule under the FTA for each imported end product was identified. This established the annual tariff differential for each end product of U. S. origin.
4. Alberta household demand for each imported end product was estimated by pro-rating imports by the ratio of Alberta households to total Canadian households.
5. Current dollar annual tariff savings based on the landed price of U.S. origin imports were calculated as the product of the tariff differential multiplied by the estimated demand for U.S. origin imports by Alberta households.
6. To calculate tariff savings in current dollars, an average mark-up of 25% was applied to adjust them to price at retail. Results were then summed annually (1989-1998) across all items by spending category.
7. Savings in current dollars were converted to 1998 dollars using the Consumer Price Index.
8. Savings per household were obtained by dividing the aggregate savings by the number of Alberta households in 1998.

APPENDIX 1(B)

In constructing Table 5.2, the upper bound estimate of tariff savings to households from the FTA, the following procedure was followed:

1. For each item import values were separated into those of U.S. origin and those from the rest of the world.
2. The import value of each item in (1) was compared with household expenditures to estimate the combined importance for each item of imports from the U.S. and domestically produced supply in total household demand.
3. The results of the calculation in (2) above were used to develop a judgement index of the penetration of the FTA tariff reduction to the retail price of each item. The index ranged from a maximum of 1.0 to a minimum limited to the share of American imports in household demand.
4. Annual item household expenditures were assumed to have the same ratio to household income as in the 1996 survey year.
5. Total Alberta household annual expenditures on each item were the product of average household expenditure on that item (which is retail price) multiplied by the number of households.
6. The total dollar value of savings was the item tariff differential multiplied by annual expenditures pro-rated by the market penetration index, summed for 1989-1998 across all items.
7. Savings in current dollars were converted to 1998 dollars using the Consumer Price Index.
8. Savings per household were obtained by dividing the aggregate savings by the number of Alberta.

REFERENCES

1. Bender, R. (1998), "Issues in Provincialising Foreign Direct Investment", (Ottawa, Statistics Canada, Balance of Payments Division).
2. Brewer, H. L. and Ronald Moomaw (1985), "A Note on Population Size, Industrial Diversification and Regional Economic Instability," Urban Studies, August, No. 22.
3. Caves, R.H., (1990), "Adjustment to International Competition", (Ottawa, Canadian Government Publishing Centre).
4. Chambers, Edward J and Michael B. Percy (1992), "Western Canada in the International Economy", Western Centre for Economic Research: University of Alberta Press.
5. Conroy, Michael (1975), "The Concept and Measurement of Regional Economic Diversification," Southern Economic Journal, January.
6. Diebold, Francis X., David Neumark and Daniel Polsk (1994), "Job Stability in the United States," National Bureau of Economic Research, Working paper No. 4859.
7. Feinberg, S.E., M.P. Keane and M.F. Bognanno (1998), "Trade Liberalization and Delocalization: New Evidence from Firm-Level Panel Data", Canadian Journal of Economics, Volume 31, No. 4.
8. Green, David and Craig Riddell (1996), "Job Duration In Canada: Is Long Term Employment Declining?," University of British Columbia: Centre for Research on Economics and Social Policy, Working paper No. DP-40.
9. Gruben, William C. and Keith Phillips (1989), "Diversifying Texas: Recent History and Prospects," Federal Reserve Bank of Dallas, Economic Review, July.
10. Heitz, A. and S. Cote (1998), Canadian Economic Observer, May 1998.
11. Mansell, Robert L. and Michael B. Percy (1990), "Strength in Adversity: a Study of the Alberta Economy", Western Centre for Economic Research: University of Alberta Press.
12. McFetridge, D.G., (1989), "Trade Liberalization and the Multinationals", (Ottawa: Canadian Government Publishing Centre)
13. Statistics Canada, CANSIM.
14. Statistics Canada, TIERS
15. Statistics Canada, CALURA
16. Statistics Canada, CTA
17. "Family Expenditures Survey", Statistics Canada - Catalogue No.62-555-XPB, 1996
18. "Household Facilities by Income and Other Characteristics" - Statistics Canada Publication 13-218
19. "The Results of the Uruguay Round" - WTO CD-ROM, 1996, ISBN 92-870-0145-6

INDEX OF TABLES

Table No. and Title	Page
1.1. Dollar value of merchandise exports, Western Canada and the four provinces, 1988-1998 (\$billions)	12
1.2. Comparison of total exports from the provinces and shares to the U.S. Market in 1988, 1997, and 1998, (\$ millions)	14
1.3. Western Canadian export performance based on value of exports per employee, 1995—1998	15
1.4. Western Canada's top twenty exports and their share in export growth (\$millions)	18
1.5. Alberta's top twenty exports and their share in export growth (\$millions)	20
1.6. British Columbia's top twenty exports and their share in export growth (\$millions)	29
1.7. Manitoba's top twenty exports and their share in export growth (\$millions)	30
1.8. Saskatchewan's top twenty exports and their share in export growth (\$millions)	31
1.9. Exports of energy and plastics: selected categories 1997 and 1998 (\$millions)	32
1.10. Exports of lumber, pulp and paper: selected categories, 1997 and 1998 (\$millions)	33
1.11. Exports of meat products: selected categories, 1997 and 1998 (\$millions)	35
1.12. Exports of vegetable and oilseeds: selected categories 1997 and 1998 (\$millions)	36
1.13. Exports of machinery & mechanical appliances: selected categories, 1997 and 1998 (\$ millions)	37
1.14. Exports of electrical equipment: selected categories, 1997 and 1998 (\$millions)	38
1.15. Exports of optical, photo equipment and measuring instruments: selected categories 1997 and 1998 (\$millions)	39
1.16. Top ten Alberta exports to Mexico in 1994, 1995, 1997 and 1998 (\$thousands)	42
1.17. Top ten Alberta exports to Chile in 1994, 1995, 1997 and 1998 (\$thousands)	45
2.1. Goods producing industries, international and inter-provincial exports as a share of Alberta output, 1988-1996	50
2.2. The growth trend of international markets for selected Alberta goods producing sectors, 1988-1996	52
2.3. The growth trend in the constant dollar value of selected Alberta manufacturing sector shipments, 1988-1996	54
2.4. The growth trend in average weekly earnings and employment for selected Alberta sectors, 1988-1996 (including a comparison with the CPI)	56
3.1. Portfolio variance of national quarterly employment change for two eras: 1976:Q1 to 1987:Q4 and 1988:Q1 to 1998:Q2	62
3.2. Portfolio variance of quarterly percent changes in employment: Alberta for each of two eras: 1976:Q1 to 1987:Q4 and 1988:Q1 to 1998:Q2	63
3.3. Contribution of the goods and service sectors to the change in portfolio variance between the two eras: Alberta	64
3.4. Difference in portfolio variance percentage with fixed vs. actual employment composition weights in era 2	65
3.5. Indexes of variance, covariance and beta values for Alberta employment sectors 1976:Q1 to 1987:Q4 and 1988:Q1 to 1998:Q2	66
3.6. Sectors with consistent increases in their relative shares of manufacturing shipments and/or manufacturing employment since the early 1980s	68

4.1. Planned or initiated expenditures of investors for Alberta oil & gas projects, (\$millions)	87
5.1. Lower bound estimate of Alberta household savings from FTA tariff reductions by expenditure category over the decade 1989-1998 (\$ millions, in 1998 dollars)	96
5.2. Upper bound estimate of Alberta household savings from FTA tariff reductions by expenditure category over the decade 1989-1998 (\$ millions, in 1998 dollars)	97

INDEX OF FIGURES

Figure No. and Title	Page
0.1. WCER index of quarterly business activity for Alberta 1988:Q1 to 1998:Q4, (1992:Q1=100)	8
1.1. 1998 index of the value of annual provincial exports (1988=100)	13
1.2. Index of the value of exports by province, 1988-1998 (1988 = 100)	13
1.3. Western Canadian export performance on a \$ per employee basis	15
1.4. U.S. market share for exports of the four Western Canadian provinces 1988 and 1998, %	16
1.5. Percentage contribution of Western Canada's top 20 categories to export growth in 1988-1998	17
1.6. Distribution of Alberta exports to U.S. by state in energy sector in 1998 (\$billions)	22
1.7. Distribution of Alberta exports to U.S. by state in agricultural sector in 1998, (\$millions)	24
1.8. Distribution of Alberta exports to U.S. by state, excluding agricultural and energy sectors, 1988-1998, (millions)	26
1.9. WCER index of Alberta export prices 1994-1998 period (1992=100)	27
1.10. Exports of energy and plastics products, 1994-1998 (\$ millions)	33
1.11. Exports of lumber and wood pulp, 1994-1998, (\$ millions)	34
1.12. Exports of meat products, 1994-1998, (\$millions)	35
1.13. Exports of vegetable and oilseeds, 1994-1998, (\$millions)	36
1.14. Exports of machinery & mechanical appliances, 1994-1998 (\$millions)	37
1.15. Exports of electrical equipment, 1994-1998, (\$millions)	39
1.16. Exports of optical, measuring instruments, 1994-1998, (\$millions)	40
1.17. Provincial exports to Mexico, 1988-1997, (\$thousands)	41
1.18. Alberta exports of selected HS export categories to Mexico during 1994-1998 (\$dollars)	43
1.19. Provincial merchandise exports to Chile, 1994-1998 (\$ thousands)	44
1.20. Alberta exports of selected HS export categories to Chile during 1994-1998 (\$dollars)	46
4.1. FDI into Canada, (\$billions)	73
4.2. Foreign-controlled investment as % of total (non-financial industries)	74
4.3. Ratio of operating profits to assets: all industries	75
4.4. Provincial FDI, shipments and labour force (% of Canadian total)	78
4.5. Total assets: energy sector (\$millions)	80
4.6. Ratio of operating profits to assets : energy sector	81
5.1. Annual lower and upper bound savings to households from FTA tariff reductions over the decade of 1989-1998 (\$ millions, in 1998 dollars)	98