Ministère
du Développement
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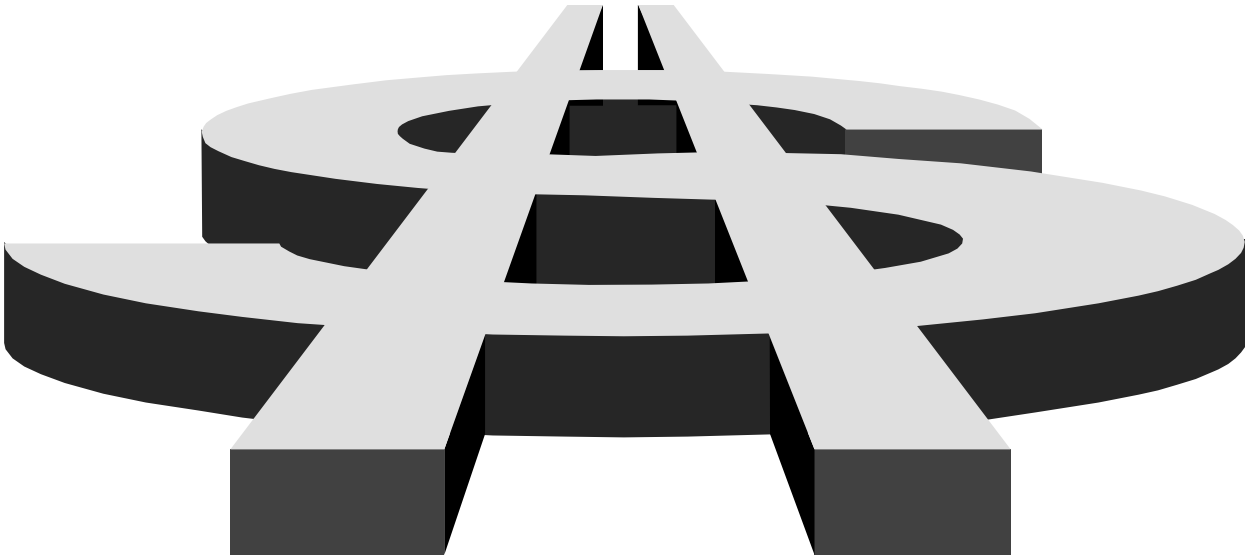
et de la Recherche
Québec

IMPACT OF THE EXCHANGE RATE APPRECIATION ON QUÉBEC EXPORT AND GDP GROWTH



Study by Jules Dufort
in collaboration with François Murray
Direction de l'analyse des relations économiques extérieures
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INTRODUCTION

The objectives of this study are twofold:

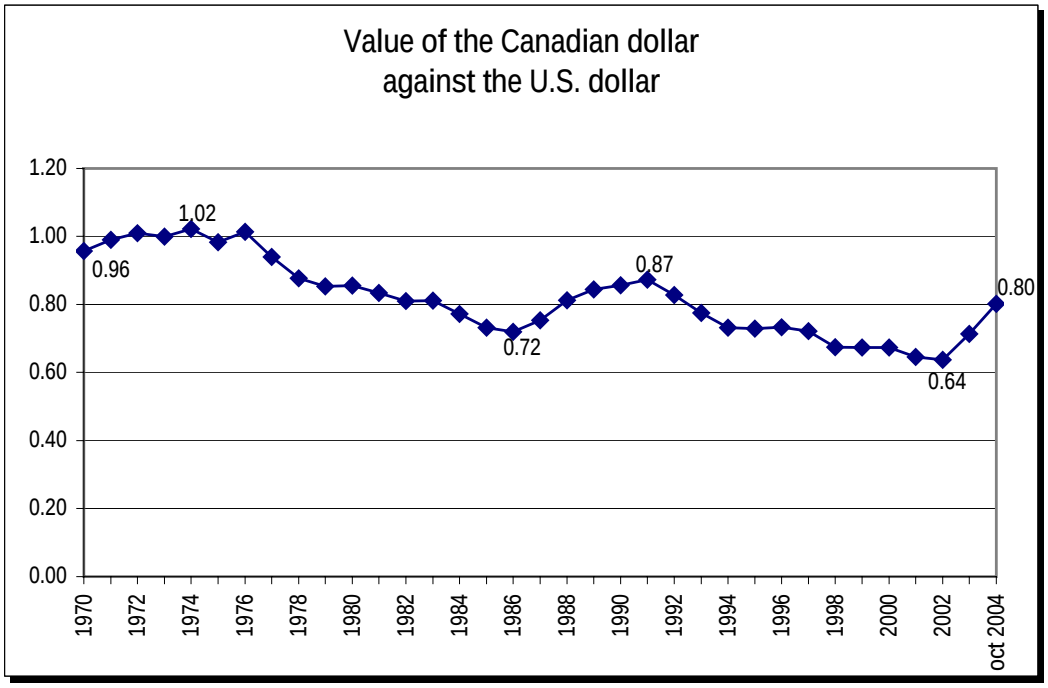
1. Determine, to a certain extent, the impact of the recent strengthening of the Canadian dollar against the U.S. dollar on Québec and Canadian GDP and on the sensitivity of Canadian exports of manufactured goods to the United States. Accordingly, the first part of the paper presents the theoretical arguments concerning the economic impact of fluctuations in the Canadian dollar. It also includes the results of recent empirical studies on the measurement of the impact of fluctuations in the Canadian dollar on Québec and Canadian GDP and on Canadian exports of manufactured goods.

2. Analyse growth in Québec exports of manufactured goods to the United States, identify the key determinants and measure export sensitivity to fluctuations in the Canadian dollar as well as the impact of the fluctuations on Québec export and GDP growth. The second part of the study focuses on that analysis.

1. Influence of the exchange rate on GDP growth in Québec and Canada and on Canadian export growth

Background

This study was conducted during a period of substantial appreciation of the Canadian dollar beginning in 2003. To put the recent appreciation of the Canadian dollar into perspective, it is helpful to briefly recap its fluctuations over almost 30 years. In 1976, the Canadian dollar was on a par with the U.S. dollar. During the period from 1976 to 1986, it depreciated from 1.01 U.S. dollars to 72 U.S. cents. That trend was subsequently reversed, in the late 1980s and early 1990s, when the dollar rose from 72 U.S. cents in 1986 to over 87 cents in 1991. However, that appreciation proved to be temporary. Many factors later contributed to the decline in the Canadian dollar, which bottomed out at 62.5 U.S. cents in August 2002. In 2003, the main economic event in Canada was the spectacular turnaround in the Canadian dollar. ***The 21.6% increase in our currency in 2003, from 63.4 U.S. cents to 77.1 cents, was the largest 12-month movement up or down in Canada's history***. However, that dramatic appreciation slowed between January 2004 (an 18.9% rise over January 2003) and April 2004 (a 14.8% rise), and between January 2003 and June 2004 (a 13.5% rise). But, in October 2004, the value of the Canadian dollar was 80.2 U.S. cents, that is, 23.4% higher than in January 2003.



Substantial appreciation of the Canadian dollar since 2003

In 2003, the most astonishing economic event was not so much the increase in the Canadian dollar as the magnitude of the appreciation. The Bank of Canada generally considers most movements in the Canadian dollar, vis-à-vis the U.S. dollar, to be attributable to changes in inflation rate differentials between the two countries, movements in interest rate differentials, fluctuating world energy prices and movements in world non-energy commodity prices.[1] While these four factors certainly do not account for all movements in the Canadian dollar, they do mirror long-term changes. In 2003, there was a major discrepancy between the value of the Canadian dollar, as calculated by the Bank of Canada using a model based on these four factors, and the observed value of the Canadian dollar. According to one explanation, the Bank of Canada's model had simply not kept pace with the actual value of the Canadian dollar, as was the case at the end of the 1980s, a period when the value of the Canadian dollar also skyrocketed against the U.S. dollar. According to another possible explanation, the surge in the Canadian dollar in 2003 stemmed primarily from a weak U.S. dollar, which had become considerably devalued against other currencies, such as the Euro.

1 Between the first quarter of 1973 and the fourth quarter of 1998, the Canadian dollar fell 44 cents against the U.S. dollar. The Bank of Canada explained that depreciation as follows (Technical Report No. 88, 2000): drop in non-energy commodity prices (56%), rise in energy prices (2%), higher inflation in Canada (23%) and other variables (25%). Interest rate differentials curtailed depreciation by 6%.

1.1 Economic impact of fluctuations in the value of the Canadian dollar: theoretical arguments

Appreciation of the dollar induces a number of economic effects, such as a slowdown in GDP and export growth

Movements in the real exchange rate[2] affect economic activity, especially in terms of the international competitiveness of Canadian or Québec production. Thus, fluctuations in the exchange rate impact on exports and imports, and, in turn, on all sectors of the economy, by modifying relative prices between exports and products for the domestic market. Appreciation of the Canadian dollar has several economic consequences, the main ones being:

- A negative impact on exports and a positive one on imports. However, the negative impact on exports is less pronounced in open economies such as Canada's and Québec's, due to the relatively high proportion of inputs imported from international markets (almost 33% for Canada and roughly 27% for Québec) for every export dollar.

- A negative impact on location decisions by multinationals, because appreciation reduces the location rent of businesses in Canada, particularly in the manufacturing sector. According to Statistics Canada, foreign direct investment (FDI) in Canada in 2003 was the lowest in 10 years.

- An offsetting effect on Canada's wealth, to the extent that Canada can influence its export prices in U.S. dollars without having any control over its import prices in U.S. dollars. Thus, in the short term, appreciation can improve terms of trade for Canada and Québec and contribute to their wealth. However, in the longer term, the negative impact on domestic production will be greater than the revenue effect generated by improved terms of trade. Over a more or less long period, appreciation of the Canadian dollar leads to a decline in Québec and Canadian GDP growth and slower export growth.

- An initially positive impact on investment decisions. For net importers of capital equipment, like Québec and Canada, appreciation reduces the cost of such goods. Similarly, for sectors where there is no international competition (financial services, real estate services, etc.), appreciation of the dollar stimulates investment. For sectors subject to international competition, such as the manufacturing sector, the net effect of appreciation on investment is indeterminate, as appreciation reduces both the cost of capital equipment and profit margins.

2 The real exchange rate is calculated by adjusting the nominal exchange rate on the basis of inflation rate differentials between Canada and the United States. Inflation can be calculated in different ways: GDP deflator, Consumer Price Index, unit costs, etc.

– Lower inflation as a result of a competitive environment that reduces the increase in import prices and salaries denominated in Canadian dollars.

The economy as a whole adjusts gradually to the appreciation of the dollar, because it does so further to the adjustment of prices on the product, service and input markets, and because it is influenced by factors such as high adjustment costs and contractual commitments on the product and input markets. However, adjustment is relatively rapid in the case of certain goods exported by Canada. The price of some exports, in particular commodities, is fixed in U.S. dollars. As a result, their price in Canadian dollars changes immediately upon any variation in the exchange rate. In other sectors, the impact of the exchange rate on prices is more gradual. Lastly, the drop in prices in the export sector prompts producers to cut their costs, including labour costs, whereas a decline in consumer prices tends to moderate wage increases.

An increase in productivity is the best adjustment to appreciation of the Canadian dollar

This brief overview of the various economic effects of the appreciation of the Canadian dollar highlights the following fact: ***In the long term, the best way for the economies of Québec and Canada to adjust to appreciation of the Canadian dollar is to narrow labour productivity gaps, however much, between them and the United States, particularly in the manufacturing sector, where the gap in 1997 was 26 percentage points for Canada and 29 percentage points for Québec, in favour of the United States.***[3] It should be borne in mind that the competitiveness of Québec producers on the U.S. market depends primarily on their production costs in Canadian dollars converted into U.S. dollars using the exchange rate. Thus, a decrease in our production costs or in the value of the Canadian dollar enhances our competitiveness on the U.S. market. Conversely, appreciation of the Canadian dollar against the U.S. dollar reduces it. Reduced competitiveness can be offset by a drop in our production costs due to better use of inputs such as labour, in other words, by an increase in labour productivity.[4]

3 Jules Dufort, "Comparaisons pour le secteur manufacturier de la productivité du travail entre le Québec, l'Ontario, le Canada et les États-Unis", MDERR, May 2004.

4 For example, if only labour costs per unit of output, in U.S. dollars, are taken into account, a 10% decrease in wages in Québec will obviously have the same effect on unit costs in U.S. dollars as a 10% increase in labour productivity (output per unit of labour) or a 10% depreciation of the Canadian dollar against its U.S. counterpart.

1.2 Economic impact of fluctuations in the value of the Canadian dollar: results of empirical studies

1.2.1 Impact of the dollar's appreciation on GDP growth in Canada

To measure the impact of the higher exchange rate on GDP, simulations based on econometric models are used, and the results vary greatly from one model to the next

Economists generally use econometric models to measure the impact of the Canadian dollar's appreciation on GDP growth. A study published by the Toronto Dominion Bank[5] contains the results of simulations of the impact of exchange rate appreciation on GDP based on several models used in Canada. ***To begin with, analysis of the results from the various simulations shows that the impact of dollar variation on GDP varies enormously from one model to another.*** For example, the impact of 20% appreciation of the Canadian dollar would reduce Canada's GDP by between 1 and 5 percentage points, depending on the model, for each of the first two years. Simulation using the model of the University of Toronto's Institute for Policy Analysis forecasts a drop in Canada's GDP of 5 percentage points for the first and second years and 1.6 percentage points for the third year, consecutive to 20% appreciation of the Canadian dollar. At the other end of the spectrum, simulation using one of the Department of Finance Canada models shows 20% appreciation of the Canadian dollar would cause Canada's GDP to drop only 2 percentage points over five quarters. Traditionally, the Bank of Canada has estimated that dollar appreciation of that magnitude would result in a 6-percentage-point reduction in GDP over two years,[6] for an annual drop of 3 percentage points.

According to analysts at the aforementioned organizations, two new facts are currently capable of attenuating the negative impact of a higher Canadian dollar on GDP. First, a number of capital investment projects were carried out in Canada, when the dollar was weaker, by investors who factored a substantially higher Canadian dollar into their profitability analysis. As a result, part of the current appreciation has a relatively small impact on their investments. Second, the import content of exports rose from 28% to 33% between 1986 and 1999. That rise makes exports proportionately less vulnerable to movements in the exchange rate.

5 "Loonies - Understanding the Rally in the Canadian Dollar and Its Consequences", *TD Economics*, *Special Report*, February 2004.

6 However, according to a study by Pierre Duguay entitled *Empirical Evidence on the Strength of the Monetary Transmission Mechanism in Canada. An Aggregate Approach*, published in 1996 by the Bank of Canada, a 20% hike in the Canadian dollar would cause, instead, a decrease of 4 to 6 percentage points in GDP over three years.

Taking into account these new facts, analysts at the Bank of Canada estimate that a 20% appreciation would cause GDP to drop 4 to 6 percentage points over two to three years, for an annual decrease ranging between 1.3 and 3 percentage points. A number of forecast experts concur with the following result: Under present conditions, an appreciation of that magnitude would slow GDP growth by roughly 2 percentage points a year in 2003 and 2004. Statistics Canada indicated[7] that the main economic event in Canada in 2003 was the 21.7% rise in the Canadian dollar, whereas GDP grew only 1.7% in 2003 compared with 3.3% in 2002. The Bank of Canada[8] forecast 4.6% GDP growth in the U.S. in 2004, against only 3.0% growth in Canada.

1.2.2 Impact of the Canadian dollar's appreciation on GDP growth in Québec and Ontario

However, some Bank of Canada and Department of Finance Canada simulations . . .

Department of Finance Canada published a study[9] on the regional impacts of appreciation of the Canadian dollar. The study uses the multiple regression method and the structural vector autoregression method to quantify the impact of dollar fluctuations on economic activity in Canada's regions (Québec, Ontario, the Prairies, British Columbia and the Atlantic provinces). The structural vector autoregression method is especially interesting, as it is possible to evaluate the cumulative impact of a higher exchange rate on regional economic activity in Canada after a number of periods.

Verifying the dynamic behaviour of structural method variables compared with the theory and literature is a very important stage in the validation of this type of model. If the method's variables do not interact adequately, the model may not be well specified, which could lead to misinterpretation of the simulation results regarding Canadian dollar appreciation. The authors of the study therefore verified the model's variables beforehand, and the dynamic behaviour of the variables are consistent with the theory and intuition. The dynamic behaviour of the different variables can be described as follows:

7 Statistics Canada, "The Economy: Year-End Review", in *The Daily*, April 14, 2004.

8 Bank of Canada, "Monetary Policy Report", October 2004.

9 Carl Gaudreault and Josée Bourque, *Impact des variations du taux de change réel sur l'activité économique régionale au Canada*, Department of Finance Canada, May 2004.

- An increase in foreign economic activity (real U.S. GDP) has positive repercussions on the regional economies. Ontario benefits the most, followed by Québec, the Prairies, the Atlantic provinces and British Columbia. The cumulative impulse responses of each of the regions are statistically significant, at a 95% confidence level.

- A more restrictive monetary policy (increase in the real interest rate) adversely affects all Canadian regions, in the following order: Ontario, Québec, the Prairies, British Columbia and the Atlantic provinces. The cumulative impulse responses are statistically significant for all regions, except Atlantic Canada.

- The regional effect of an increase in commodity prices (including such commodities as oil and natural gas) is also consistent with theoretical intuition. Regions that, historically, have been net importers of raw materials (Ontario, Québec and Atlantic Canada) see a slight decline of statistical significance in their economic activity further to an increase in commodity prices, whereas the Prairies, a region that, historically, has been a net exporter of raw materials, benefits greatly from the increase. British Columbia's cumulative impulse response is roughly zero and not statistically significant.

. . . yielded comparable results for Canada. GDP was affected the most in Québec and Ontario

For the Canadian economy as a whole, the drop in GDP following a 20% appreciation of the dollar was 1.8 percentage points after one year and 4.4 percentage points after two years, for a 2.6-percentage-point reduction in the second year. ***Interestingly, Department of Finance Canada found that the impact on GDP consecutive to a 20% increase in the dollar was comparable to the impact, after two years, estimated by the Bank of Canada.*** For the five regions of Canada, GDP was the most adversely affected in Ontario, where it fell 2.3 percentage points the first year and 2.9 points the second year. Ontario was closely followed by Québec, where GDP fell 2 percentage points the first year and 2.8 points the second year. These results for Ontario and Québec are hardly surprising, given that Canada's manufacturing sector is concentrated there. The adverse effect on GDP was pronounced for the Prairies, but was not statistically significant for British Columbia or Atlantic Canada.

The results of these simulations must be interpreted with caution, as the simulations were carried out with econometric models that use historical data. But, as we mentioned earlier, new facts have come to light which attenuate the impact of the current appreciation. ***Most interestingly, these simulations showed the impact of a higher dollar to be greater the second year than the first.***

1.2.3 Simulations of decreased economic activity further to Canadian dollar appreciation yielded wide-ranging results

The major differences in the simulated impact of Canadian dollar appreciation using various econometric models are undoubtedly due primarily to the two factors below:

- For the most part, fluctuations in Canada's GDP can be explained statistically by movements in U.S. GDP growth, as the two economies are largely interdependent. As a result, when econometric models must be estimated with a limited quantity of data, the effect of variations in the value of the Canadian dollar cannot be easily distinguished from that of variations in U.S. demand, the interest rate or commodity prices. Moreover, this problem is intensified by the correlation between changes in these explanatory variables, which is especially the case regarding commodity prices (excluding energy) and the exchange rate.

- GDP growth in Canada (or its regions) reacts immediately to fluctuations in U.S. demand, whereas it reacts after a certain lapse of time to movements in the exchange rate. Thus, a simulation in the study conducted by Department of Finance Canada indicates that a 1%-increase in the exchange rate results in a 0.24-percentage-point drop in Québec GDP after two years, while a Bank of Canada (Pierre Duguay, *op.cit.*) study showed that U.S. GDP growth in a given quarter had measurable effects on Canada's GDP during only two quarters.

In our opinion, the combined effect of these two factors causes numerous problems in specifying and estimating the impact of movements in the exchange rate on economic activity.

1.2.4 Effect of exchange rate appreciation on Canadian exports of manufactured goods

An Industry Canada study says the increase in the volume of Canadian exports to the United States is due essentially to the rise in U.S. demand . . .

Industry Canada[10] analysed the determinants of Canadian exports of manufactured goods during the 1980s and 1990s. ***The authors of the study concluded that the Free Trade Agreement (FTA) had a modest effect on export volume growth (increase of 8 to 9 percentage points) and that a 1% rise in U.S. demand had an impact four to five times greater on export growth (rise of 2.2 to 2.5 percentage points) than a 1% increase in the real exchange rate (0.5-percentage-point drop in export growth).*** Thus, the results of Industry Canada's multiple regressions for the 1980s and 1990s indicate that 1% U.S. GDP growth increases the volume of Canadian exports by between 2.2% and 2.5%, all else, such as the exchange rate and U.S. tariffs, being equal. The authors of the Industry Canada study appear to implicitly attribute these increases in Canadian exports, relative to U.S. GDP growth, to the rise in U.S. demand. As indicated below, we attribute the increases not only to factors relating to U.S. demand, but also to other factors linked to Canadian supply in a context of globalization.

The Industry Canada results imply that Canadian exports rise more rapidly than growth in U.S. demand (measured by GDP growth) and have made market share gains in the United States. However, we believe that these market share gains depend instead on factors tied to Canadian supply in a context of globalization. Since the 1950s, world trade has expanded three times more rapidly than world GDP thanks to trade liberalization, technological progress and production internationalization (and fragmentation), three factors that have enabled producers to further capitalize on the comparative advantages of each country, in particular through FDI, primarily in the manufacturing sector.

Moreover, according to the estimates of the Industry Canada study, the effects of Canadian dollar appreciation are fully felt during the 12 months following the appreciation. However, that result gives us pause, as it very likely stems from the considerable difficulty in distinguishing the effect of the exchange rate from the effect of other variables such as U.S. demand, as we saw earlier. Estimating becomes even more difficult when the same estimating technique is applied to large manufacturing industries. The impacts tied to the different determinants of export growth are therefore frequently insignificant from a statistical standpoint.

10 Ram Acharya, Prakash Sharma and Someshwar Rao, "Canada-U.S. Trade and Investment Patterns" in *North American Linkages: Opportunities and Challenges for Canada*, University of Calgary Press, 2003.

. . . and the results are the same for Québec: FTA competitiveness gains and Canadian dollar depreciation account for only 20% of export volume growth

In addition, we did certain calculations using, for Québec, regression coefficients estimated by the Industry Canada authors for Canadian exports of manufactured goods to the United States[11] for the 1980-1999 period. The results were as follows: ***almost 80% of growth in the volume of Québec exports to the United States between 1988 and 1998 stemmed from growth in U.S. GDP*** (hence, from U.S. demand, according to the interpretation of the regression coefficients implicitly accepted by the Industry Canada authors), ***while nearly 20% of Québec competitiveness gains stemmed from the FTA and Canadian dollar depreciation.***

To distinguish the effect of U.S. demand and the exchange rate from the effects of other variables on Québec export growth for each of the principal industries in the manufacturing sector, we thought it appropriate to use a method completely different from multiple regression and structural vector autoregression. In the second part of the study, we analyse growth in Québec exports of manufactured goods to the United States and attempt to identify the main determinants using the constant market share method.

2. Analysis of the determinants of growth in Québec exports of manufactured goods to the United States and the sensitivity of Québec exports to movements in the exchange rate

This second section of the study presents the determinants of growth in Québec exports of manufactured goods to the United States during the 1988-1991, 1988-1998 and 1988-2001 periods. The choice of periods takes into account both Canadian dollar fluctuations (see the graph on page 4) and data availability. The various calculations relative to our analysis of determinants are contained in tables 1 to 13 of the appendix. However, the focus is on the results for the 1988-1998 and 1988-2001 periods, as they are long enough for trends to be identified. Subsequently, we analyse the sensitivity of Québec exports to movements in the exchange rate.

11 Had we explained the growth in Québec export volume by way of the same regression as Industry Canada, using the same variables (U.S. GDP, real exchange rate and capacity utilization rate) rather than Canadian export volume growth, we would probably have obtained virtually identical regression coefficients. Indeed, the volume percentage of Canadian exports of manufactured goods to the United States accounted for by Québec undoubtedly varied little over the 1980-1999 period. Accordingly, a very strong correlation most certainly exists between real Québec and real Canadian exports of manufactured goods to the United States. To wit, the correlation coefficient between the volume of Québec and Canadian exports was 0.992 for the 1981-1997 period.

To begin with, we present various descriptive statistics (export growth rate, relative weight of Québec's principal industrial groups in exports of manufactured goods, apparent U.S. market share, etc.) for Québec manufacturing sector exports as a whole and for each principal industrial group in the sector. Next, we use the constant market share method to break down the increase in the value of Québec exports to the United States on the basis of three factors:

- growth in U.S. demand
- concentration of Québec exports in industries where growth in U.S. demand is strong or weak
- Québec's competitiveness gains on the U.S. market at the expense of U.S. and other suppliers

We then compare these initial results with those obtained by Industry Canada in its analysis of determinants of Canadian exports to the United States. Lastly, we attempt to estimate the fluctuation in Québec export volume that would be induced by a 1% variation in the Canadian dollar, and the growth that would have occurred in the volume of Québec exports in 2003 and 2004 had it not been for the strong surge in the Canadian dollar.

2.1 Growth in Québec exports of manufactured goods to the United States between 1988 and 2001 and between 1988 and 1998

Between 1988 and 2001, Québec exports to the United States rose very rapidly . . .

During the 1988-2001 period, when the Canadian dollar depreciated nearly 20%, Québec exports of manufactured goods to the United States almost tripled in value, from US$13 billion to $36.2 billion, for an average annual growth rate of 8.2%. The textile industry posted the highest sales increase (856.7%) during the period, followed by the wearing apparel industry and miscellaneous industries, such as furniture, and rubber and plastics products. The following industries posted the lowest export growth rate: paper and paper products, basic metals, and coke, refined petroleum products and nuclear fuel (see tables 1 to 4).

During the 1988-1991 period, exports rose 15.4% in value further to 7.4% appreciation of the Canadian dollar. This situation was due primarily to the 167% rise in exports by the electronic and optical equipment industry, which accounted for 97% of the increase in Québec exports of manufactured goods to the United States, an increase totaling approximately US$2 billion during the period.

The 1988-1998 period posted 135.8% growth in the value of Québec exports of manufactured goods to the United States, which rose from US$13 billion to $30.6 billion, for an average annual growth rate of 9.0%. The Canadian dollar depreciated 17.3% during that period, and U.S. tariffs on Québec exports were eliminated when the FTA came into effect. The highest growth rates were posted in the following industries: textile (691.5%), wearing apparel (388.0%), miscellaneous industries such as furniture (350.4%), rubber and plastics products (336.1%), and electrical and optical equipment (331.9%). Lastly, during 1998-2001, exports of manufactured goods rose 18.3%, while the Canadian dollar remained stable, between 0.65 and 0.67 U.S. cents.

The ranking and weight of industries exporting manufactured goods varied between 1988 and 2001. Interestingly, the transport equipment industry has ranked first since 1998, whereas it ranked third in 1988 and fourth in 1991. The position of all other industries—except for coke, petroleum products and nuclear fuel, and publishing and printing—did not change between 1998 and 2001.

. . . along with the Québec's share of the market

During the 1988-2001 period, the apparent U.S. market share held by Québec industries exporting manufactured goods almost doubled, from 0.46% in 1988 to 0.85% in 2001, and the average annual growth rate was 4.8%. Thus, Québec's apparent U.S. market share rose 84.5% between 1988 and 2001. The textiles industry posted the strongest growth, rising from a market share of 0.10% in 1988 to 0.78% in 2001, for an increase of 662.2%. The second- and third-highest growth rates were posted by the apparel industry (364.8%) and the miscellaenous industries (230.0%). Market share growth was lowest in the following industries: petroleum products (4.0%), paper products (21.7%) and printing and publishing (57.6%).

2.2 Determinants of Québec exports of manufactured goods to the United States between 1988 and 1998 and between 1988 and 2001

Using a method other than Industry Canada's shows. . .

The constant market share method enables growth in Québec's U.S. market sales to be broken down on the basis of the ***demand effect***, the ***composition effect*** and the ***competitiveness effect***. The first two effects are tied to U.S. demand patterns, while the competitiveness effects depends on factors relating to Québec supply.

The demand effect measures Québec export growth assuming that exports keep pace with the rise in the apparent U.S. market for manufactured goods, as a whole, where Québec's share of that

market will remain unchanged. For a given industry, the constant market share method implicitly postulates export elasticity, in terms of fluctuations in U.S. demand, equal to 1. For its part, Industry Canada estimates that elasticity,[12] respecting the volume of Canadian exports of manufactured goods to the United States, to be between 2.2 and 2.5 using the multiple regression method.

The composition effect is another element directly related to U.S. demand and, to a certain extent, to the ability of Québec supply to adapt to that demand. Thus, for a given industry, the composition effect is negative or positive depending on whether U.S. market growth for that industry is below or above the apparent market growth rate for U.S. industries as a whole. The composition effect is negative or positive for Québec overall when its sales are concentrated in industries with slow or strong growth in the United States.

For a given industry, the constant market share method also postulates that any gain in Québec's market share in the United States stems implicitly from improvement in the competitive position of Québec supply against that of one, several or all of Québec's competitors on the U.S. market. Thus, ***the competitiveness effect*** is negative or positive for a given industry when Québec sales growth in the United States for that industry is below or above the sales growth required to ensure that Québec's share in the apparent U.S. market for that industry does not change. The competitiveness effect is negative or positive for industries as a whole when the value of the market share losses of the individual industries is higher or lower than the value of their market share gains. Moreover, Québec can make U.S. market share gains at the expense of U.S. or foreign suppliers. We therefore estimated the gains against U.S. suppliers as well as foreign suppliers.[13]

The share of Québec exports on the apparent U.S. market for manufactured goods was 0.46% in 1988, 0.51% in 1991, 0.74% in 1998 and 0.85% in 2001. Thus, between 1988 and 2001, Québec made substantial market share gains in the United States. In fact, analysis of Québec sales growth in the United States shows that the increase of US$23 222 million between 1988 and 2001 is explained in large part by competitiveness gains. For that period, the demand effect was US$6641 million, the composition effect-US$1605 million and the competitiveness effect US$18 186 million. In addition, competitiveness gains against U.S. and foreign suppliers were US$16 549 million and US$1637 million respectively. These results reflect the 179% rise in

12 Had we estimated Québec export elasticity using multiple regression and the same variables (U.S. GDP, real exchange rate and capacity utilization rate) for Québec as those used by Industry Canada, we would probably have obtained virtually the same elasticity as for Canada, given that the share of Québec exports in the volume of Canadian exports of manufactured goods to the United States undoubtedly varied little over the 1980-1999 period (see note 11).

13 Readers interested in learning more about the constant market share method and the breakdown of competitiveness gains can consult the following works: 1- *L'Industrie québécoise de l'habillement depuis l'entrée en vigueur de l'Accord de libre-échange* (MIC, 1999); 2- Edward Learner and Robert Stern, *Quantitative International Economics* (Boston, 1970).

Québec exports for the period under study, compared with 146% for U.S. imports as a whole and 35.5% for U.S. production intended for the domestic market.

Moreover, between 1988 and 2001, Québec posted positive competitiveness and market share gains for all of the principal industrial groups analysed (see Table 7). The gains were particularly high in the following industries:

- transport equipment: US$3266 million
- electrical and optical equipment:US$2922 million
- basic metals: US$2175 million
- wood: US$1560 million

As indicated earlier, most of Québec's competitiveness gains were made at the expense of U.S. producers. ***Thus, not surprisingly, the industries in which Québec posted the highest and lowest competitiveness gains against suppliers as a whole are also the industries in which it posted the highest and lowest competitiveness gains against its U.S. competitors*** (see Table 10).

In short, between 1988 and 2001, the determinants of growth in Québec exports to the United States yielded the following results:

- Increased U.S. demand accounted for 28.6% of Québec sales growth.
- The concentration of Québec sales in slow-growth industries contributed to a 6.9% decline in Québec export growth.
- Québec competitiveness gains against U.S. market suppliers as a whole accounted for 78.3% of the rise in Québec exports.

Hence, the competitiveness effect was the principal determinant of Québec sales growth during the 1988-2001 period. The importance of this factor varies considerably from one industry to the next, even though its contribution to Québec export growth is positive for all industries. Thus, between 1988 and 2001, the principal industrial groups on which the competitiveness effect had the most impact are as follows (see Table 13):

- basic metals: 101.2% of growth in Québec exports to the United States
- textiles: 97.0%
- wearing apparel: 93.9%
- leather: 87.9%
- miscellaneous industries (including furniture): 84.5%

. . . that the FTA had a substantial impact on the competitiveness of certain industries . . .

Thus, industries whose competitiveness gains are the most important factor explaining U.S. market sales growth during the 1988-2001 period are generally those for which U.S. tariffs were relatively high in 1988. That observation applies especially to the textile, wearing apparel, leather and furniture industries.

Between 1988 and 2001, the industries in which the competitiveness effect was the least important factor in their U.S. sales growth are as follows:

- non-metallic mineral products: 69.6% of growth in Québec exports to the United States
- printing: 64.8%
- paper: 48.6%
- petroleum and coal products: 8.4 %

Québec competitiveness gains in the United States at the expense of U.S. suppliers accounted for 91% of all competitiveness gains against suppliers as a whole, including foreign suppliers. The following industries had the highest percentage in that regard:

- refined petroleum and coal products: 268.6%
- printing: 100.5%;
- chemicals and chemical products: 100.0%
- paper: 98.5%

The industries with the lowest gains at the expense of U.S. suppliers are the following:

- machinery: 86.2%
- miscellaneous industries (including furniture): 81.7%
- wearing apparel: 78.8%
- leather: 53.6%

This last group of industries thus made a larger percentage of their competitiveness gains in the United States at the expense of foreign suppliers. It is not surprising for the furniture, wearing apparel and leather industries to be in this group, as the gradual elimination of the relatively high U.S. tariffs in these sectors after the FTA came into effect gave Canadian industries considerably preferential access compared with other suppliers established outside the United States.

After conducting the same analyses for the 1988-1991 and 1988-1998 periods, we arrived at the same conclusions. The results presented in the table below are particularly evocative in that regard.

Determinants of growth in Québec exports of manufactured goods to the United States

Period	Growth in Québec exports to the United States	U.S. demand	Composition effect	Competitiveness effect	Gains agains U.S. suppliers (as a % of the competitiveness effect)
1988-1991	100	20.3	-36.2	116.0	84.1
1988-1998	100	34.9	-3.9	69.0	90.2
1988-2001	100	28.6	-6.9	78.3	91.0

. . . and that competitiveness gains, not increased U.S. demand, were the principal factor in the growth in Québec exports to the United States

The results of our analysis of the determinants of growth in the value of Québec exports on the U.S. market emphasize the crucial contribution of Québec competitiveness gains. It is useful to point out that essentially the same results are obtained when explaining growth in the volume of Québec exports on the U.S. market. Thus, when the constant market share method is applied to explain growth in the volume of Québec exports on the U.S. market during the 1988-1998 period,[14] the following result is obtained: ***Increased U.S. demand accounted for 28% of growth in the volume of Québec exports; the competitiveness effect accounted for 72%***. Thus, the latter result contrasts strongly with the one obtained using the regression coefficients[15] published by the Industry Canada authors, for whom nearly 80% of growth in the volume of Québec exports to the United States between 1988 and 1998 stemmed from U.S. GDP growth (hence, from U.S. demand, according to the interpretation of the regression coefficients implicitly accepted by the Industry Canada authors), and roughly 20% from Québec competitiveness gains further to the FTA and depreciation of the Canadian dollar.

14 We analysed growth in the volume of Québec exports on the U.S. market for the 1988-1998 period only, because, as we will see later on, certain variables explaining the competitiveness effect (in particular, those used in unit cost comparisons between Québec and the United States) were not available for the 1988-2001 period.

15 We feel that these coefficients can be applied to real Québec exports of manufactured goods (see note 11).

2.3 Sensitivity of exports to movements in the exchange rate

These competitiveness gains are due in large part . . .

Given the preceding, variation in the volume of Québec exports of manufactured goods to the United States consecutive to a 1% fluctuation in the exchange rate (elasticity), which we estimate in this section using the results of the constant market share analysis, cannot help but differ starkly from the elasticity result obtained by Industry Canada with the multiple regression method. It should be borne in mind that Industry Canada's estimate of the elasticity of real Canadian exports (and, by extension, real Québec exports) was only 0.5, and that all effects of a movement in the exchange rate were felt in the following 12 months. In our opinion, however, that result is explained by the fact that the elasticity of Canadian and Québec exports further to fluctuations in the U.S. demand ranged from 2.2 to 2.5 using the multiple regression method, whereas it was only 1.0 for a given product using the constant market share method, as the latter method postulates that any market share variation stems from fluctuations in Québec's competitive position, rather than from factors relating to U.S. demand.

We therefore calculated, using the constant market share method, the variation in the volume of Québec exports of manufactured goods to the United States following a 1% fluctuation in the exchange rate. To that end, we used two variables also taken into account in Industry Canada's estimates, namely, U.S. tariffs[16] and unit costs in U.S. dollars. Given the availability of these variables,[17] our estimate bears only on the 1988-1998 period. The main results of that analysis are given below:

- Growth in the volume of Québec exports of manufactured goods to the United States was 108% between 1988 and 1998. Growth in U.S. demand accounted for 28% of that increase in Québec sales, while gains in Québec's competitiveness on the U.S. market accounted for 72% of the increase. In addition, the competitiveness gains realized at the expense of U.S. suppliers represented 95% of Québec's total competitiveness gains on the U.S. market. Thus, the competitiveness gains realized at the expense of U.S. suppliers resulted in a 74% increase (108 x 0.72 x 0.95) in the volume of Québec exports of manufactured goods to the United States during the 1988-1998 period.

16 The U.S. tariffs were drawn from a study entitled *Canada—United States Free Trade Agreement. An Economic Evaluation*, Department of Finance, Canada, 1990.

17 U.S. tariffs were eliminated gradually over the 1988-1998 period. In addition, unit costs in Québec in 1998 were estimated on the basis of Canadian unit costs (1988-1998) and the trend in the Québec/Canada unit cost ratio between 1988-1997.

– Only part of that 74% growth stemmed from an increase in the price competitiveness of Québec suppliers, that is, the ability of Québec manufacturers to compete price-wise on the U.S. market. How big a part is not known, however, as non-price-related competitiveness depends on a number of variables, such as subsidies, marketing, technological innovation and research. That said, non-price-related competitiveness can be presumed to account for at most 35% of competitiveness gains realized at the expense of U.S. suppliers between 1988 and 1998, because a large percentage of Québec exports is composed of basic products (wood, paper and primary metal processing) and labour-intensive products (textiles, clothing, leather and furniture), whose prices play an important role. ***Thus, 48.1% growth (74 % x 65 %) in the volume of Québec exports of manufactured goods to the United States can be attributed to Québec's price competitiveness increase between 1988 and 1998.***

. . . to the FTA and, especially, to Canadian dollar depreciation

– Moreover, a 14.3% increase in price competitiveness can be established further to improvements in Québec unit costs (in U.S. dollars) over U.S. unit costs between 1988 and 1998.[18] ***In addition, the gradual elimination of U.S. tariffs after the Free Trade Agreement came into effect can be estimated to have increased the competitiveness of Québec producers against their U.S. counterparts by 4.5% during the same period.***[19] Consequently, between 1988 and 1998, Québec producers increased their price competitiveness 18.8% over U.S. suppliers. ***It is very important to point out that the improvement of Québec unit costs in U.S. dollars was due entirely to depreciation of the Canadian dollar during the period analysed, as the same costs in Canadian dollars rose a little more rapidly in Québec than in the United States between 1988 and 1998.***

Given the preceding, Québec can be considered to increase the volume of its exports of manufactured goods to the United States by 2.56 percentage points (48.1/18.8) for every percentage-point increase in its price competitiveness. However, the foreign input content of international exports of goods was 29 cents per export dollar. Thus, if it is postulated that all these inputs are imported from the United States, or from countries whose currency fluctuates the same way as the U.S. dollar against the Canadian dollar, every 1% fluctuation in the Canadian dollar may be said to produce a 1.8 percentage point variation in Québec exports of manufactured goods,

18 As estimated by the authors, using Statistics Canada and OECD data.

19 See note 16.

because 1% variation in the exchange rate results in a 0.71 percentage point variation[20] in Québec producers' price advantage, all else being equal.

In the long term, the reduction in the volume of Québec exports following 1% appreciation of the Canadian dollar is 1.8 percentage points . . .

This 1.8-percentage-point estimate of the elasticity of Québec exports against the exchange rate may seem high. What it means is that 20% appreciation of the Canadian dollar would, in the long term, cause growth in the volume of Québec exports of manufactured goods to the United States to fall 36 percentage points. ***However, that estimate is plausible if the long-term dynamic effects (over five to ten years) of such an appreciation on the foreign and national investment location rent is taken into account.*** In that regard, it should be pointed out that, in the wake of the FTA and the substantial depreciation of the Canadian dollar during the 1990s, the ratio obtained by dividing Québec's international exports of goods by its GDP nearly doubled between 1988 and 2001, rising from 19.1% in 1988 (level comparable to 1981) to 32.4% in 1998 and 36.5% in 2001. Consequently, these data substantiate our contentions regarding the impact of the exchange rate on the investment location rent.

. . . whereas Industry Canada estimated the reduction to be only 0.5 percentage points in the short term

We are also of the opinion that Industry Canada's 0.5-percentage-point estimate of the short-term variation (over one year) in the volume of Québec exports consecutive to a 1% fluctuation in the Canadian dollar is relatively low. In addition, contrary to Industry Canada, we do not believe that the full impact on exports of a movement in the exchange rate is felt within a single year, even when the fluctuation in the value of the dollar is relatively low.

2.4 Estimated impact of an increased exchange rate on Québec exports and GDP

Given that our elasticity estimate cannot be used to determine the sensitivity of the volume of Québec exports of manufactured goods to the United States (or elsewhere) to fluctuations in the value of the Canadian dollar over a period of one or two years, we estimated instead the growth loss in the volume of such exports for 2003 and 2004 further to appreciation of the Canadian dollar. For the estimate, we used one of the coefficients estimated by Industry Canada in its study on the determinants of the volume of Canadian exports of manufactured goods to the United States,

20 On the basis of the assumptions made, a fluctuation in the Canadian dollar would affect only the Canadian content of exports of goods, established at 71 cents per export dollar.

applying it to the volume of Québec exports of manufactured goods to the United States given that there is undoubtedly a strong correlation between Canadian and Québec exports (see note 11). Thus, all else being equal (in particular, the exchange rate and U.S. tariffs), 1% growth in U.S. GDP causes an increase in the volume of Canadian (and therefore Québec) exports of manufactured goods to the United States of between 2.2% and 2.5%. The authors of the Industry Canada study appear to have implicitly attributed this rise in Canadian exports, associated with U.S. GDP growth, to increased U.S. demand. We, on the other hand, attribute the rise to factors relating to U.S. demand as well as to other factors, such as investment, tied to Canadian supply in a context of globalization.[21]

We estimate export growth loss to be 8% in 2003 and 5% in 2004 . . .

Prior to the sudden appreciation of the Canadian dollar in 2003, the Canadian national and foreign investment location rent was very high when the exchange rate was roughly 64 U.S. cents. Because U.S. GDP rose 3.0% in 2003 and should increase 4.6% in 2004, we estimate that the volume of Canadian and Québec exports of manufactured goods should have grown at least 6.6% in 2003 (3 x 2.2) and 10.1% in 2004 (4.6 x 2.2) had the exchange rate remained stable at the 2002 rate of 64 U.S. cents. Instead, however, the volume of Québec international exports of goods declined 1.7% in 2003 and rose 5.0% for the first eight months of 2004.[22] ***Given the preceding, the growth loss in the volume of Québec international exports of goods stemming from appreciation of the exchange rate may reasonably be estimated to be approximately 8 percentage points in 2003 (6.6 – (-1.7)) and 5 percentage points in 2004 (10.1 –5.0).***[23]

21 In that regard, in a context of globlalization, where production factors (specialized labour force, technology and FDI) are very mobile, it should be remembered that world trade has been expanding three times more rapidly than world GDP since 1950. In addition, between 1988 and 2001, the volume of Canadian exports of goods also increased nearly three (2.85) times more rapidly than U.S. GDP, as a result of a set of factors that impacted on Canadian export performance. Consequently, we are comfortable with Industry Canada's estimate of the elasticity of Canadian exports against U.S. GDP, evaluated at between 2.2 and 2.5. However, that elasticity against U.S. GDP must not be confused with the elasticity of Canadian exports against U.S. demand, which is approximately 1. For example, the elasticity of Québec exports against U.S. demand using the constant market share method was 0.9 between 1988 and 1998, when the concentration of Québec sales in products where growth in U.S. demand is relatively low is taken into account.

22 The data on growth in the volume of Québec exports of goods are drawn from the international trade records of Statistics Canada and the Institut de la statistique du Québec (ISQ). We used data from these sources, rather than the economic accounts data, because they indicate the trends of the past few months.

23 For the purpose of these estimates, it is implicitly assumed that all of Québec's international exports of goods were intended for the United States. That percentage was approximately 85% in 2000 and the years immediately thereafter. It is also assumed that the exports are composed primarily of manufactured goods. These two assumptions do not greatly affect the quality of our estimates, because they largely reflect reality. Furthermore, any downward adjustments of the U.S. GDP growth rate do not affect the scale of our results. Thus, we could have multiplied the U.S. GDP growth rate by 2.5 or 2.35 ((2.2+2.5)/2) rather than by 2.2.

All else being equal, Industry Canada estimated that growth in the volume of Canadian imports of manufactured goods from the United States consecutive to 1% growth in Canadian GDP was between 3.2 and 3.6 percentage points. However, that coefficient cannot be used to extrapolate the growth in the volume of Canadian and Québec imports of manufactured goods from the United States that would have occurred failing the substantial appreciation of 2003, for the following reasons: First, Canadian imports generally depend on Canadian domestic demand and Canadian exports, given the relatively high imported input content of exports.[24] Second, to translate these relations solely in terms of Canadian GDP, fairly ambitious assumptions must be made (perfect synchronization of the Canadian and U.S. cycles, relatively stable exchange rate from year to year, etc.), which were not borne out during the 2003-2004 period. Thus, given that the volume of interprovincial exports of goods declined much less (drop of 0.1%, according to the ISQ's economic accounts) than the volume of international exports (drop of 6.8%) in 2003, we assume instead, in the absence of other relevant information, that an increase in Canadian exports of goods following appreciation of the Canadian dollar will have an impact on Québec GDP equivalent to 50% of the impact on Québec GDP growth caused by the slowdown in Québec international exports of goods.

. . . and Québec GDP loss to be 2.4% in 2003 and 1.5% in 2004, which is comparable to Bank of Canada and Department of Finance Canada estimates

By using certain results of the joint MDERR–ISQ study[25] concerning the impact of Québec exports on the Québec economy, ***the drop in the volume of Québec's international exports of goods and the consequences of an increase in Canadian exports may be estimated to have caused a 2.4% drop in Québec GDP in 2003 and a 1.5% drop in 2004***. According to our estimates, appreciation of the Canadian dollar produces a cumulative Québec GDP loss of 3.9% in two years. Of potential interest is the Québec GDP loss further to 17% appreciation of the Canadian dollar—4.08% after two years, according to Department of Finance Canada estimates, despite the use of a completely different method. It should also be remembered that the estimates of Department of Finance Canada are comparable to those of the Bank of Canada.

24 In the Industry Canada study (see note 8), the regression coefficients associated with real Canadian imports of manufactured goods from the United States and with Canadian GDP were much higher (3.2 and 3.6) than those associated with real Canadian exports of manufactured goods to the United States and with U.S. GDP (2.2 and 2.5). This is undoubtedly due to the fact that U.S. exports of manufactured goods to Canada contain few inputs imported from Canada.

25 *Impact économique des exportations québécoises, années 1990, 1997 et 2001*, MDERR and ISQ, October 2003.

CONCLUSION

A number of observations can be made on the basis of this study:

1. The impact of a fluctuation in the value of the Canadian dollar on GDP varies greatly depending on the model used, because of the many problems with specification and estimation inherent in econometric models used to quantify the impact of such fluctuations. Experts at the Bank of Canada and the Department of Finance Canada estimate different, but comparable, impacts on Canadian GDP following a movement in the exchange rate. In Canada, Québec GDP and Ontario GDP are the most affected.

2. A method completely different from the ones in the aforementioned studies should be used to distinguish the effect of U.S. demand, from that of the exchange rate, on growth of Québec exports to the United States. Thus, to measure the role played by the various determinants of growth in Québec exports to the United States, we used the constant market share method, which postulates, in particular, that all market share gains for a given product implicitly stem from an improvement in the competitive position of Québec supply. Under that method, the determinants of growth in the value of Québec exports to the United States yielded the following results for the years between 1988 and 2001:

   - Increased U.S. demand accounted for 28.6% of Québec sales growth.
   - The concentration of Québec sales in slow-growth industries contributed to a 6.9% decline in Québec export growth.
   - Québec competitiveness gains against U.S. market suppliers as a whole accounted for 78.3% of the increase in Québec exports. In addition, 91% of Québec competitiveness gains as a whole were realized at the expense of U.S. suppliers.

   The results of our analysis of the determinants of growth in the value of Québec exports to the U.S. market highlight, in particular, the crucial contribution of Québec competitiveness gains. In addition, we obtained essentially the same results when we explained the growth in the volume of Québec exports to the U.S. market: 28% of the increase in Québec exports between 1988 and 1998 stemmed from the rise in U.S. demand, and 72% from the competitiveness effect. ***A very large part of the competitiveness gains stemmed from the elimination of U.S. custom duties further to the FTA and depreciation of the exchange rate.*** Those results were in stark contrast with the ones obtained using the method in an Industry Canada study published in 2003. That study showed that the FTA had a modest impact on export

volume growth and that an increase in U.S. demand had an impact four to five times greater than the real exchange rate.

3. We estimated that, all else being equal, the very long-term variation (over a period of five to ten years) in the volume of Québec exports following a 1% fluctuation in the exchange rate was 1.8 percentage points, where the variation in the value of the Canadian dollar was sufficiently substantial and long-lasting to modify the long-term foreign and national investment location rent, especially in the manufacturing sector. By comparison, Industry Canada evaluated the short-term variation (over a one-year period) in export volume to be 0.5 percentage points. Contrary to the authors of the Industry Canada study, we do not believe that all of the effects of dollar fluctuation are felt within a 12-month period, even when the fluctuation is relatively weak.

4. The estimated growth loss in the volume of Québec exports of goods following appreciation of the Canadian dollar was 8% in 2003 and 5% in 2004, for a cumulative volume loss of 13 percentage points in two years.

5. Appreciation of the Canadian dollar produced an estimated cumulative Québec GDP loss of 3.9% in two years (2.4% in 2003 and 1.5% in 2004), which is comparable to the losses estimated by Department of Finance Canada and the Bank of Canada, if an average Canadian dollar appreciation of 17% is postulated for the 2003-2004 period. Thus, according to our estimates, Québec GDP growth would have been roughly 4% in 2003, rather than 1.9%, had the exchange rate remained at 64 cents as in 2002, all else being equal.

6. The best way for the Québec economy to adjust, in the long term, to dollar appreciation consists in closing its labour productivity gap with the United States, at least in part, particularly in the manufacturing sector, where the gap is about 30 percentage points in the U.S.'s favour. It should be remembered that the competitiveness of Québec producers on the U.S. market depends primarily on their production costs in U.S. dollars, that is, on their production costs in Canadian dollars converted to U.S. dollars using the exchange rate. Thus, a drop in our production costs or in the value of the Canadian dollar brings about an increase in our competitiveness on the U.S. market. Conversely, appreciation of the Canadian dollar reduces our competitiveness. Decreased competitiveness may be offset by a reduction in our production costs further to better use of input factors, such as labour, that is, by improved labour productivity.

Statistical Appendix

DEFINITIONS

A. Apparent market

Apparent market = shipments + imports – exports = domestic market shipments + imports

B. Constant market share method

The constant market share method is used to break down Québec sales growth on the U.S. market, according to the demand effect, the composition effect and the competitiveness effect. It should be noted that the first two effects are tied to U.S. demand patterns, whereas the competitiveness effect depends on factors related to Québec supply.

1. Demand effect: Measures Québec export growth according to the assumption that exports rise at the same pace as the apparent U.S. market for manufactured goods, as a whole, that is, according to the assumption that Québec's share of the apparent U.S. market for manufactured goods will not change.
2. Composition effect: Another element directly related to U.S. demand and the ability of Québec supply to adapt to that demand. Thus, for a given industry, the composition effect is negative or positive depending on whether U.S. market growth for that industry is below or above the apparent market growth rate for U.S. industries as a whole. The composition effect is negative or positive for Québec overall when its sales are concentrated in industries with slow or strong growth in the United States.
3. Competitiveness effect: The constant market share method postulates that any gain in Québec's market share in the United States stems implicitly from improvement in the competitive position of Québec supply against that of one, several or all of Québec's competitors on the U.S. market. Thus, the competitiveness effect is negative or positive for a given industry when Québec sales growth in the United States for that industry is below or above the sales growth required to ensure that Québec's share in the apparent U.S. market for that industry does not change. The competitiveness effect is negative or positive for industries as a whole when the value of the market share losses of the individual industries is higher or lower than the value of their market share gains.

Table 1
Québec exports of manufactured goods to the United States
(In millions of U.S. dollars)

		1988	1991			1998			2001		
ISIC (Rev. 3)[1]	Industry	$M	$M	Growth 1988-1991 (%)	AAGR 1988-1991 (%)	$M	Growth 1988-1998 (%)	AAGR 1988-1998 (%)	$M	Growth 1988-2001 (%)	AAGR 1988-2001 (%) *
Total	**MANUFACTURING ACTIVITIES**	**12,981.3**	**14,979.3**	**15.4**	**4.9**	**30,609.8**	**135.8**	**9.0**	**36,203.5**	**178.9**	**8.2**
17	Textiles	89.5	145.7	62.7	17.6	708.5	691.5	23.0	856.4	856.7	19.0
18	Wearing apparel; dressing and dyeing of fur	173.7	195.5	12.6	4.0	847.6	388.0	17.2	1,058.2	509.2	14.9
36	Miscellaneous industries (including furniture)	313.9	396.8	26.4	8.1	1,413.7	350.4	16.2	1,786.9	469.3	14.3
25	Rubber and plastics products	267.3	305.8	14.4	4.6	1,165.7	336.1	15.9	1,457.9	445.4	13.9
20	Wood, and products of wood and cork products, except furniture	559.9	487.2	-13.0	-4.5	2,320.5	314.4	15.3	2,441.8	336.1	12.0
30-31-32-33	Electrical and optical equipment	1,161.6	3,096.8	166.6	38.7	5,017.1	331.9	15.8	4,836.2	316.3	11.6
24	Chemicals and chemical products	412.4	601.1	45.8	13.4	1,330.4	222.6	12.4	1,576.2	282.2	10.9
29	Manufacture of machinery and equipment, n.e.c.	585.2	732.8	25.2	7.8	1,678.6	186.8	11.1	2,077.9	255.1	10.2
19	Leather and leather articles; footwear	38.8	42.9	10.4	3.4	112.7	190.3	11.2	136.7	252.2	10.2
28	Manufacture of fabricated metal products, except machinery and equipment	312.5	302.4	-3.2	-1.1	728.8	133.2	8.8	967.4	209.6	9.1
15-16	Food products and beverages; tobacco products	482.2	693.4	43.8	12.9	1,022.8	112.1	7.8	1,402.9	190.9	8.6
34-35	Transport equipment	2,604.0	1,986.7	-23.7	-8.6	5,132.2	97.1	7.0	7,265.3	179.0	8.2
26	Other non-metallic mineral products	173.4	165.2	-4.7	-1.6	336.4	94.0	6.9	410.7	136.8	6.9
22	Publishing, printing and reproduction of recorded media	147.2	132.6	-9.9	-3.4	274.8	86.7	6.4	337.6	129.4	6.6
23	Coke, refined petroleum products and nuclear fuel	201.1	195.6	-2.7	-0.9	241.1	19.9	1.8	367.7	82.8	4.8
27	Electrical and optical equipment	2,673.8	2,438.1	-8.8	-3.0	4,386.1	64.0	5.1	4,823.5	80.4	4.6
21	Paper and paper products	2,784.7	3,060.6	9.9	3.2	3,892.6	39.8	3.4	4,400.0	58.0	3.6

*** : In decreasing order**

Sources: Statistics Canada and ISQ.

Direction de l'analyse des relations économiques extérieures, MDERR.

[1] To obtain Québec exports using the ISIC classification, we first calculated the exports using the NAICS classification. We then used Statistics Canada's NAICS-ISIC concordance table.

AAGR: Average Annual Growth Rate.

Table 2
Ranking and weight of Québec industries exporting manufactured goods to the United States

		1988		1991		1998		2001	
ISIC (Rev. 3)	Industry	Ranking	Weight (% of total)	Ranking	Weight (% of total)	Ranking	Weight (% of total)	Ranking	Weight (% of total)
Total	**MANUFACTURING ACTIVITIES**	**---**	**100.0**	**---**	**100.0**	**---**	**100.0**	**---**	**100.0**
34-35	Transport equipment	3	20.1	4	13.3	1	16.8	1	20.1
30-31-32-33	Electrical and optical equipment	4	8.9	1	20.7	2	16.4	2	13.4
27	Basic metals	2	20.6	3	16.3	3	14.3	3	13.3
21	Paper and paper products	1	21.5	2	20.4	4	12.7	4	12.2
20	Wood, and products of wood and cork products, except furniture	6	4.3	8	3.3	5	7.6	5	6.7
29	Manufacture of machinery and equipment, n.e.c.	5	4.5	5	4.9	6	5.5	6	5.7
36	Miscellaneous industries (including furniture)	9	2.4	9	2.6	7	4.6	7	4.9
24	Chemicals and chemical products	8	3.2	7	4.0	8	4.3	8	4.4
25	Food products and beverages; tobacco products	11	2.1	10	2.0	9	3.8	9	4.0
15-16	Wearing apparel; dressing and dyeing of fur	7	3.7	6	4.6	10	3.3	10	3.9
18	Publishing, printing and reproduction of recorded media	13	1.3	13	1.3	11	2.8	11	2.9
28	Manufacture of fabricated metal products, except machinery and equipment	10	2.4	11	2.0	12	2.4	12	2.7
17	Textiles	16	0.7	15	1.0	13	2.3	13	2.4
26	Other non-metallic mineral products	14	1.3	14	1.1	14	1.1	14	1.1
23	Coke, refined petroleum products and nuclear fuel	12	1.5	12	1.3	16	0.8	15	1.0
22	Publishing, printing and reproduction of recorded media	15	1.1	16	0.9	15	0.9	16	0.9
19	Leather and leather articles; footwear	17	0.3	17	0.3	17	0.4	17	0.4

*** : In decreasing order**

Sources: Statistics Canada and ISQ.
Direction de l'analyse des relations économiques extérieures, MDERR.

Table 3

Share of apparent U.S. market held by Québec

		Share held (%)				Growth in Québec's market share (%)			
ISIC (Rev. 3)	Industry	1988	1991	1998	2001 *	1988-1991	1988-1998	1998-2001	1988-2001
Total	**MANUFACTURING ACTIVITIES**	**0.46**	**0.51**	**0.74**	**0.85**	**11.8**	**60.0**	**15.3**	**84.5**
27	Basic metals	1.61	1.69	2.09	2.92	5.5	30.2	39.8	82.1
21	Paper and paper products	2.21	2.33	2.36	2.69	5.7	7.1	13.6	21.7
20	Wood, and products of wood and cork products, except furniture	0.74	0.68	1.88	2.04	-7.7	155.1	8.5	176.7
18	Wearing apparel; dressing and dyeing of fur	0.26	0.28	0.97	1.21	8.4	270.9	25.3	364.8
34-35	Transport equipment	0.66	0.54	0.90	1.20	-18.7	35.3	34.3	81.7
36	Miscellaneous industries (including furniture)	0.34	0.41	0.91	1.11	22.8	171.6	21.5	230.0
25	Rubber and plastics products	0.27	0.29	0.71	0.84	4.9	158.0	18.7	206.4
30-31-32-33	Electrical and optical equipment	0.31	0.80	0.78	0.79	154.0	150.4	0.9	152.7
17	Textiles	0.10	0.16	0.59	0.78	58.7	477.9	31.9	662.2
29	Manufacture of machinery and equipment, n.e.c	0.30	0.39	0.56	0.73	29.0	84.5	29.5	138.9
19	Leather and leather articles; footwear	0.19	0.21	0.43	0.52	10.1	120.1	22.7	170.0
26	Other non-metallic mineral products	0.26	0.27	0.34	0.44	3.1	31.3	27.4	67.2
28	Manufacture of fabricated metal products, except machinery and equipment	0.19	0.19	0.30	0.41	-1.0	57.4	35.3	112.9
24	Chemicals and chemical products	0.17	0.22	0.35	0.39	31.1	108.8	11.2	132.2
15-16	Food products and beverages; tobacco products	0.13	0.16	0.20	0.25	26.1	50.1	27.4	91.2
22	Publishing, printing and reproduction of recorded media	0.10	0.08	0.13	0.16	-16.8	30.8	20.5	57.6
23	Coke, refined petroleum product and nuclear fuel	0.14	0.12	0.17	0.15	-17.4	16.3	-10.6	4.0

*** : In decreasing order**

Sources: Statistics Canada, ISQ and OECD - STAN database, May 2004.

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Table 4
Growth and relative weight of the apparent U.S. market for the various manufacturing industries

		1988-1991			1988-1998		1998-2001	1988-2001	
ISIC (Rev. 3)	Industry	Growth (%)	1988 (% of total)	1991 (% of total)	Growth (%)	1998 (% of total)	Growth (%)	Growth (%)	2001 (% of total)
Total	**MANUFACTURING ACTIVITIES**	**3.1**	**100.0**	**100.0**	**47.4**	**100.0**	**2.6**	**51.2**	**100.0**
30-31-32-33	Electrical and optical equipment	4.7	13.1	13.4	72.5	15.4	-4.5	64.8	14.3
34-35	Transport equipment	-6.5	13.9	12.7	45.7	13.8	5.4	53.6	14.2
15-16	Food products and beverages; tobacco products	12.3	13.1	14.5	41.3	12.6	7.7	52.2	13.2
24	Chemicals and chemical products	10.0	8.7	9.4	54.5	9.1	6.6	64.6	9.5
29	Manufacture of machinery and equipment, n.e.c.	-3.0	6.8	6.4	55.5	7.2	-4.4	48.6	6.7
23	Coke, refined petroleum products and nuclear fuel	15.0	5.0	5.7	3.0	3.5	70.7	75.9	5.8
28	Manufacuture of fabricated metal products, except machinery and equipment	-2.3	5.8	5.5	48.2	5.8	-1.9	45.4	5.5
22	Publishing, printing and reproduction of recorded media	7.7	5.2	5.5	42.8	5.1	2.0	45.6	5.0
25	Rubber and plastics products	8.3	3.5	3.6	69.0	4.0	5.3	78.0	4.1
27	Basic metals	-15.7	5.9	4.9	25.9	5.0	-21.4	-1.0	3.9
21	Paper and paper products	3.8	4.5	4.5	30.5	4.0	-0.5	29.8	3.8
36	Miscellaneous industries (including furniture)	2.9	3.3	3.3	65.8	3.7	4.0	72.5	3.8
20	Wood, and products of wood and cork products, except furniture	-6.1	2.7	2.5	62.4	3.0	-3.0	57.6	2.8
17	Textiles	2.5	3.1	3.1	37.0	2.9	-8.4	25.5	2.6
26	Other non-metallic mineral products	-8.2	2.3	2.1	47.7	2.4	-4.2	41.6	2.2
18	Wearing apparel; dressing and dyeing of fur	3.7	2.4	2.4	31.6	2.1	-0.4	31.1	2.0
19	Leather and leather articles; footwear	0.2	0.7	0.7	31.9	0.6	-1.1	30.4	0.6

*** : In decreasing order**

Sources: OECD - STAN database, May 2004.

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Table 5
Determinants of variation of Québec exports of manufactured goods to the United States between 1988 and 1991
(in millions of U.S. dollars)

ISIC (Rev. 3)	Industry	1988-1991			
		Variation in Québec exports	Demand effect	Composition effect	Competitiveness effect
Total	**MANUFACTURING ACTIVITIES**	**1,998.1**	**404.8**	**-723.9**	**2,317.3**
15-16	Food products and beverages; tobacco products	211.2	15.0	44.4	151.8
17	Textiles	56.2	2.8	-0.6	53.9
18	Wearing apparel; dressing and dyeing of fur	21.8	5.4	1.1	15.4
19	Leather and leather articles; footwear	4.0	1.2	-1.1	3.9
20	Wood, and products of wood and cork products, except furniture	-72.7	17.5	-51.8	-38.4
21	Paper and paper products	275.9	86.8	20.2	168.9
22	Publishing, printing and reproduction of recorded media	-14.5	4.6	6.7	-25.8
23	Coke, refined petroleum products and nuclear fuel	-5.5	6.3	24.0	-35.8
24	Chemicals and chemical products	188.7	12.9	28.5	147.4
25	Rubber and plastics products	38.4	8.3	13.9	16.2
26	Other non-metallic mineral products	-8.2	5.4	-19.7	6.1
27	Basic metals	-235.7	83.4	-503.3	184.2
28	Manufacture of fabricated metal products, except machinery and equipment	-10.1	9.7	-17.0	-2.8
29	Manufacture of machinery and equipment, n.e.c.	147.6	18.2	-36.0	165.3
30-31-32-33	Electrical and optical equipment	1,935.2	36.2	18.6	1,880.4
34-35	Transport equipment	-617.2	81.2	-251.3	-447.2
36	Miscellaneous industries (including furniture)	82.9	9.8	-0.7	73.8

Sources: Statistics Canada, ISQ and OECD - STAN database, May 2004.
Direction de l'analyse des relations économiques extérieures, MDERR.

Table 6
Determinants of variation of Québec exports of manufactured goods to the United States between 1988 and 1998
(in millions of U.S. dollars)

ISIC (Rev. 3)	Industry	1988-1998			
		Variation in Québec exports	Demand effect	Composition effect	Competitiveness effect
Total	**MANUFACTURING ACTIVITIES**	**17,628.5**	**6,150.3**	**-683.2**	**12,161.5**
15-16	Food products and beverages; tobacco product	540.6	228.5	-29.1	341.3
17	Textiles	619.0	42.4	-9.3	585.9
18	Wearing apparel; dressing and dyeing of fur	673.9	82.3	-27.5	619.1
19	Leather and leather articles; footwear	73.9	18.4	-6.0	61.5
20	Wood, and products of wood and cork products, except furniture	1,760.6	265.3	84.3	1,411.0
21	Paper and paper products	1,108.0	1,319.3	-470.3	258.9
22	Publishing, printing and reproduction of recorded media	127.7	69.7	-6.8	64.7
23	Coke, refined petroleum products and nuclear fuel	40.0	95.3	-89.2	33.9
24	Chemicals and chemical products	918.0	195.4	29.2	693.4
25	Rubber and plastics products	898.4	126.7	57.8	713.9
26	Other non-metallic mineral products	163.0	82.2	0.6	80.2
27	Basics metals	1,712.3	1,266.8	-573.1	1,018.5
28	Manufacture of fabricated metal products, except machinery and equipment	416.3	148.0	2.6	265.7
29	Manufacture of machinery and equipment, n.e.c	1,093.4	277.3	47.5	768.6
30-31-32-33	Electrical and optical equipment	3,855.4	550.4	291.5	3,013.5
34-35	Transport equipment	2,528.2	1,233.7	-43.5	1,338.0
36	Miscellaneous industries (including furniture)	1,099.8	148.7	57.9	893.2

Sources : Statistics Canada, ISQ and OECD - STAN database, May 2004.
Direction de l'analyse des relations économiques extérieures, MDERR.

Table 7
Determinants of variation of Québec exports of manufactured goods to the United States between 1988 and 2001
(in millions of U.S. dollars)

ISIC (Rev. 3)	Industry	1988-2001			
		Variation in Québec exports	Demand effect	Composition effect	Competitiveness effect
Total	**MANUFACTURING ACTIVITIES**	**23,222.2**	**6,640.8**	**-1,605.0**	**18,186.4**
15-16	Food products and beverages; tobacco products	920.7	246.7	4.9	669.1
17	Textiles	766.9	45.8	-23.0	744.1
18	Wearing apparel; dressing and dyeing of fur	884.5	88.9	-34.9	830.6
19	Leather and leather articles; footwear	97.9	19.9	-8.0	86.1
20	Wood, and products of wood and cork products, except furniture	1,881.9	286.4	36.0	1,559.5
21	Paper and paper products	1,615.3	1,424.5	-594.5	785.2
22	Publishing, printing and reproduction of recorded media	190.5	75.3	-8.2	123.4
23	Coke, refined petroleum products and nuclear fuel	166.6	102.9	49.7	14.0
24	Chemicals and chemical products	1,163.8	211.0	55.4	897.5
25	Rubber and plastics products	1,190.6	136.8	71.8	982.1
26	Other non-metallic mineral products	237.3	88.7	-16.6	165.1
27	Basics metals	2,149.7	1,367.8	-1,393.5	2,175.4
28	Manufacture of fabricated metal products, except machinery and equipment	654.9	159.8	-17.9	513.0
29	Manufacture of machinery and equipment, n.e.c.	1,492.7	299.4	-14.8	1,208.1
30-31-32-33	Electrical and optical equipment	3,674.6	594.2	158.1	2,922.2
34-35	Transport equipment	4,661.3	1,332.1	63.5	3,265.8
36	Miscellaneous industries (including furniture)	1,473.0	160.6	67.0	1,245.4

Sources: Statistics Canada, ISQ and OECD - STAN database, May 2004.
Direction de l'analyse des relations économiques extérieures, MDERR.

Table 8
Breakdown of competitiveness gains and losses by Québec suppliers on the U.S. market, 1988-1991
(in millions of U.S. dollars)

ISIC (Rev. 3)	Industry	1988-1991		
		Competitiveness gains or losses relative to suppliers as a whole	Competitiveness gains or losses relative to U.S. suppliers	Competitiveness gains or losses relative to other suppliers
Total	**MANUFACTURING ACTIVITIES**	**2,317.3**	**1,949.9**	**367.4**
15-16	Food products and beverages; tobacco products	151.8	142.0	9.8
17	Textiles	53.9	49.4	4.6
18	Wearing apparel; dressing and dyeing of fur	15.4	17.3	-2.0
19	Leather and leather articles; footwear	3.9	4.5	-0.6
20	Wood, and products of wood and cork products, except furniture	-38.4	-35.2	-3.2
21	Paper and paper products	168.9	132.1	36.8
22	Publishing, printing and reproduction of recorded media	-25.8	-25.4	-0.4
23	Coke, refined petroleum products and nuclear fuel	-35.8	-34.0	-1.8
24	Chemicals and chemical products	147.4	138.9	8.5
25	Rubber and plastics products	16.2	14.9	1.3
26	Other non-metallic mineral products	6.1	5.6	0.5
27	Basic metals	184.2	171.7	12.5
28	Manufacture of fabricated metal product, except machinery and equipment	-2.8	-3.1	0.2
29	Manufacture of machinery and equipment, n.e.c	165.3	132.8	32.5
30-31-32-33	Electrical and optical equipment	1,880.4	1,476.9	403.4
34-35	Transport equipment	-447.2	-298.3	-148.9
36	Miscellaneous industries (including furniture)	73.8	59.7	14.1

Sources: Statistics Canada, ISQ and OECD - STAN database, May 2004
Direction de l'analyse des relations économiques extérieures, MDERR.

Table 9
Breakdown of competitiveness gains and losses by Québec suppliers on the U.S. market, 1988-1998
(in millions of U.S. dollars)

ISIC (Rev. 3)	Industry	1988-1998		
		Competitiveness gains or losses relative to suppliers as a whole	Competitiveness gains or losses relative to U.S. suppliers	Competitiveness gains or losses relative to other suppliers
Total	**MANUFACTURING ACTIVITIES**	**12,161.5**	**10,966.0**	**1,195.5**
15-16	Food products and beverages; tobacco products	341.3	328.9	12.4
17	Textiles	585.9	527.6	58.3
18	Wearing apparel; dressing and dyeing of fur	619.1	489.9	129.2
19	Leather and leather articles; footwear	61.5	33.9	27.6
20	Wood, and products of wood and cork products, except furniture	1,411.0	1,332.9	78.1
21	Paper and paper products	258.9	259.6	-0.7
22	Publishing, printing and reproduction of recorded media	64.7	65.6	-0.9
23	Coke, refined petroleum products and nuclear fuel	33.9	30.5	3.3
24	Chemicals and chemical products	693.4	672.7	20.7
25	Rubber and plastics products	713.9	663.3	50.6
26	Other non-metallic mineral products	80.2	78.5	1.7
27	Basic metals	1,018.5	1,048.2	-29.7
28	Manufacture of fabricated metal produts, except machinery and equipment	265.7	257.8	7.9
29	Manufacture of machinery and equipment, n.e.c.	768.6	668.6	100.0
30-31-32-33	Electrical and optical equipment	3,013.5	2,554.3	459.3
34-35	Transport equipment	1,338.0	1,228.2	109.8
36	Miscellaneous industries (including furniture)	893.2	725.5	167.8

Sources: Statistics Canada, ISQ and OECD - STAN database, May 2004
Direction de l'analyse des relations économiques extérieures, MDERR.

Table 10
Breakdown of competitiveness gains and losses by Québec suppliers on the U.S. market, 1988-2001
(in millions of U.S. dollars)

ISIC (Rev. 3)	Industry	1988-2001		
		Competitiveness gains or losses relative to suppliers as a whole	Competitiveness gains or losses relative to U.S. suppliers	Competitiveness gains or losses relative to other suppliers
Total	**MANUFACTURING ACTIVITIES**	**18,186.4**	**16,549.0**	**1,637.4**
15-16	Food products and beverages; tobacco products	669.1	641.7	27.4
17	Textiles	744.1	673.2	70.9
18	Wearing apparel; dressing an dyeing of fur	830.6	654.1	176.5
19	Leather and leather articles; footwear	86.1	46.1	40.0
20	Wood, and products of wood and cork products, except furniture	1,559.5	1,478.3	81.2
21	Paper and paper products	785.2	773.1	12.2
22	Publishing, printing and reproduction of recorded media	123.4	124.1	-0.7
23	Coke, refined petroleum products and nuclear fuel	14.0	37.6	-23.6
24	Chemicals and chemical products	897.5	897.5	0.0
25	Rubber and plastics products	982.1	912.5	69.5
26	Other non-metallic mineral products	165.1	158.8	6.3
27	Basic metals	2,175.4	2,045.2	130.2
28	Manufacture of fabricated metal products, except machinery and equipment	513.0	495.8	17.2
29	Manufacture of machinery and equipment, n.e.c.	1,208.1	1,040.8	167.3
30-31-32-33	Electrical and optical equipment	2,922.2	2,595.5	326.7
34-35	Transport equipment	3,265.8	2,956.9	308.9
36	Miscellaneous industries (including furniture)	1,245.4	1,018.0	227.4

Sources: Statistics Canada, ISQ and OECD - STAN database, May 2004
Direction de l'analyse des relations économiques extérieures, MDERR.

Table 11
Determinants of growth in Québec exports of manufactured goods to the United States between 1988 and 1991

ISIC (Rev. 3)	Industry	1988-1991					
		Growth in Québec exports to the United States (Total = 100)	Determinants			Competitiveness gains relative to U.S. suppliers (% of competitiveness effect)	Competitiveness gains relative to other suppliers (% of competitiveness effect)
			U.S. demand	Composition effect	Competitiveness effect		
Total	**MANUFACTURING ACTIVITIES**	**100.0**	**20.3**	**-36.2**	**116.0**	**84.1**	**15.9**
15-16	Food products and beverages; tobacco products	100.0	7.1	21.0	71.9	93.5	6.5
17	Textiles	100.0	5.0	-1.0	96.0	91.5	8.5
18	Wearing apparel; dressing and dyeing of fur	100.0	24.8	4.8	70.4	112.9	-12.9
19	Leather and leather articles; footwear	100.0	30.0	-27.7	97.7	114.4	-14.4
20	Wood, and products of wood and cork products, except furniture	100.0	-24.0	71.2	52.8	91.6	8.4
21	Paper and paper products	100.0	31.5	7.3	61.2	78.2	21.8
22	Publishing, printing and reproduction of recorded media	100.0	-31.6	-46.3	177.9	98.3	1.7
23	Coke, refined petroleum products and nuclear fuel	100.0	-113.8	-435.4	649.3	95.0	5.0
24	Chemicals and chemical products	100.0	6.8	15.1	78.1	94.2	5.8
25	Rubber and plastics products	100.0	21.7	36.2	42.2	92.2	7.8
26	Other non-metallic mineral products	100.0	-66.1	240.4	-74.2	91.7	8.3
27	Basic metals	100.0	-35.4	213.5	-78.2	93.2	6.8
28	Manufacture of fabricated metal products, except machinery and equipment	100.0	-96.8	168.8	28.0	108.7	-8.7
29	Manufacture of machinery and equipment, n.e.c.	100.0	12.4	-24.4	112.0	80.4	19.6
30-31-32-33	Electrical and optical equipment	100.0	1.9	1.0	97.2	78.5	21.5
34-35	Transport equipment	100.0	-13.2	40.7	72.4	66.7	33.3
36	Miscellaneous industries (including furniture)	100.0	11.8	-0.9	89.1	80.8	19.2

Sources: Statistics Canada, ISQ and OECD - STAN database, May 2004.
Direction de l'analyse des relations économiques extérieures, MDERR.

Table 12
Determinants of growth in Québec of manufactured goods to the United States between 1988 and 1998

ISIC (Rev. 3)	Industry	1988-1998					
		Growth in Québec exports to the United States (Total = 100)	Determinants			Competitiveness gains relative to U.S. suppliers (% of competitiveness effect)	Competitiveness gains relative to other suppliers (% of competitiveness effect)
			U.S. demand	Composition effect	Competitiveness effect		
Total	**MANUFACTURING ACTIVITIES**	**100.0**	**34.9**	**-3.9**	**69.0**	**90.2**	**9.8**
15-16	Food products and beverages; tobacco products	100.0	42.3	-5.4	63.1	96.4	3.6
17	Textiles	100.0	6.9	-1.5	94.7	90.1	9.9
18	Wearing apparel; dressing and dyeing of fur	100.0	12.2	-4.1	91.9	79.1	20.9
19	Leather and leather articles; footwear	100.0	24.9	-8.1	83.2	55.1	44.9
20	Wood, and products of wood and cork products, except furniture	100.0	15.1	4.8	80.1	94.5	5.5
21	Paper and paper products	100.0	119.1	-42.4	23.4	100.3	-0.3
22	Publishing, printing and reproduction of recorded media	100.0	54.6	-5.3	50.7	101.4	-1.4
23	Coke, refined petroleum products and nuclear fuel	100.0	238.3	-223.0	84.7	90.2	9.8
24	Chemicals and chemical products	100.0	21.3	3.2	75.5	97.0	3.0
25	Rubber and plastics products	100.0	14.1	6.4	79.5	92.9	7.1
26	Other non-metallic mineral products	100.0	50.4	0.4	49.2	97.9	2.1
27	Basic metals	100.0	74.0	-33.5	59.5	102.9	-2.9
28	Manufacture of fabricated metal products, except machinery and equipment	100.0	35.6	0.6	63.8	97.0	3.0
29	Manufacture of machinery and equipment, n.e.c.	100.0	25.4	4.3	70.3	87.0	13.0
30-31-32-33	Electrical and optical equipment	100.0	14.3	7.6	78.2	84.8	15.2
34-35	Transport equipment	100.0	48.8	-1.7	52.9	91.8	8.2
36	Miscellaneous industries (including furniture)	100.0	13.5	5.3	81.2	81.2	18.8

Sources: Statistics Canada, ISQ and OECD - STAN database, May 2004
Direction de l'analyse des relations économiques extérieures, MDERR.

Table 13
Determinants of growth in Québec exports of manufactured goods to the United States between 1988 and 2001

ISIC (Rev. 3)	Industriy	1988-2001					
		Growth in Québec exports to the United States (Total = 100)	Determinants			Competitiveness gains relative to U.S. suppliers (% of competitiveness effect)	Competitiveness gains relative to other suppliers (% of competitiveness effect)
			U.S. demand	Composition effect	Competitiveness effect		
Total	**MANUFACTURING ACTIVITIES**	**100.0**	**28.6**	**-6.9**	**78.3**	**91.0**	**9.0**
15-16	Food products and beverages; tobacco products	100.0	26.8	0.5	72.7	95.9	4.1
17	Textiles	100.0	6.0	-3.0	97.0	90.5	9.5
18	Wearing apparel; dressing and dyeing of fur	100.0	10.0	-3.9	93.9	78.8	21.2
19	Leather and leather articles; footwear	100.0	20.3	-8.2	87.9	53.6	46.4
20	Wood, and products of wood and cork products, except furniture	100.0	15.2	1.9	82.9	94.8	5.2
21	Paper and paper products	100.0	88.2	-36.8	48.6	98.5	1.5
22	Publishing, printing and reproduction of recorded media	100.0	39.5	-4.3	64.8	100.5	-0.5
23	Coke, refined petroleum products and nuclear fuel	100.0	61.8	29.8	8.4	268.6	-168.6
24	Chemicals and chemical products	100.0	18.1	4.8	77.1	100.0	0.0
25	Rubber and plastics products	100.0	11.5	6.0	82.5	92.9	7.1
26	Other non-metallic mineral products	100.0	37.4	-7.0	69.6	96.2	3.8
27	Basic metals	100.0	63.6	-64.8	101.2	94.0	6.0
28	Manufacture of fabricated metal products, except machinery and equipment	100.0	24.4	-2.7	78.3	96.6	3.4
29	Manufacture of machinery and equipment, n.e.c.	100.0	20.1	-1.0	80.9	86.2	13.8
30-31-32-33	Electrical and optical equipment	100.0	16.2	4.3	79.5	88.8	11.2
34-35	Transport equipment	100.0	28.6	1.4	70.1	90.5	9.5
36	Miscellaneous industries (including furniture)	100.0	10.9	4.6	84.5	81.7	18.3

Sources: StatistiCS Canada, ISQ et OECD - STAN database, May 2004
Direction de l'analyse des relations économiques extérieures, MDERR.