LIBRARY of PARLIAMENT
BIBLIOTHÈQUE du PARLEMENT

BACKGROUND PAPER

Exchange Rate Fluctuations and the Competitiveness of the Canadian Manufacturing Sector

Publication No. 2013-19-E
22 April 2013

Mathieu Frigon

Economics, Resources and International Affairs Division
Parliamentary Information and Research Service

Library of Parliament ***Background Papers*** provide in-depth studies of policy issues. They feature historical background, current information and references, and many anticipate the emergence of the issues they examine. They are prepared by the Parliamentary Information and Research Service, which carries out research for and provides information and analysis to parliamentarians and Senate and House of Commons committees and parliamentary associations in an objective, impartial manner.

Exchange Rate Fluctuations and the Competitiveness of the Canadian Manufacturing Sector
(Background Paper)

Publication No. 2013-19-E

Ce document est également publié en français.

CONTENTS

EXCHANGE RATE FLUCTUATIONS AND THE COMPETITIVENESS OF THE CANADIAN MANUFACTURING SECTOR*

1 INTRODUCTION

The strengthening of the Canadian dollar against the U.S. dollar over the past 10 years has led to numerous discussions in Canada about the "Dutch disease."[1] This term refers to the notion that an economic boom in commodities leads to a rise in the exchange rate that harms the competitiveness of the manufacturing sector's exports. Eventually this phenomenon can lead to a fairly large-scale deindustrialization of a national economy.

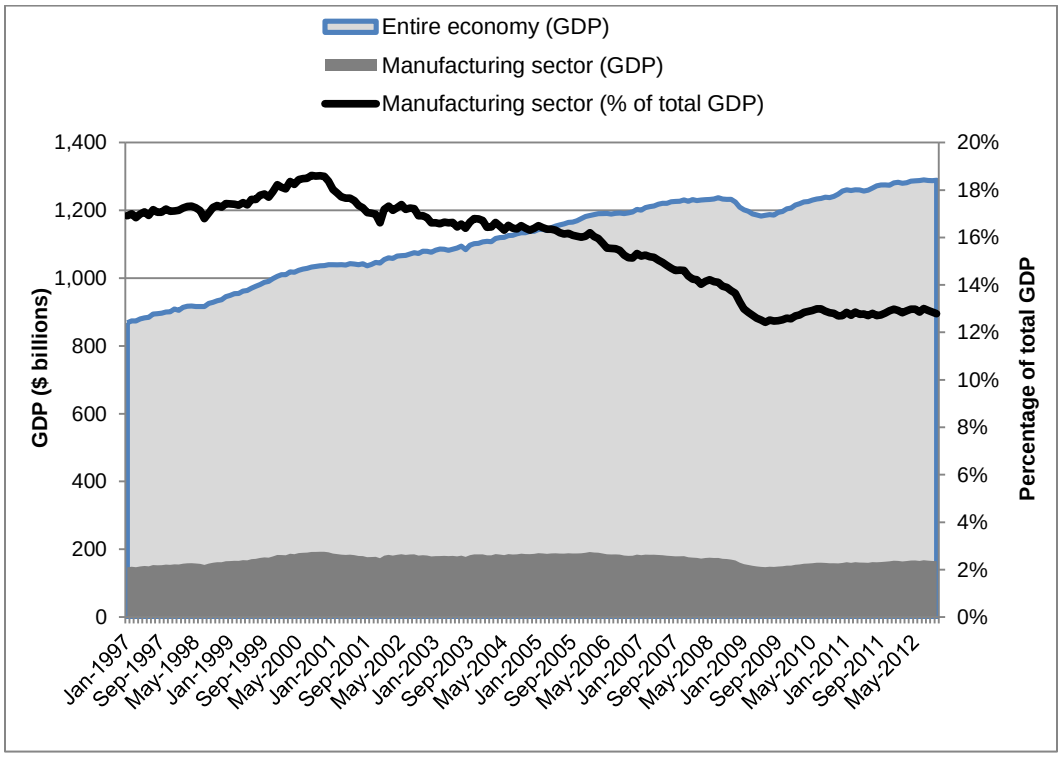
In this context, the purpose of this paper is to clarify the role that exchange rate fluctuations play in the changing competitiveness of the Canadian manufacturing sector. First, the paper analyzes changes in this sector in Canada and in selected industrialized countries. Next, for all of these countries, it examines the competitiveness of this sector, measured by unit labour cost, and compares the impacts of various factors, including the exchange rate, on this cost. Lastly, the paper draws some conclusions about the role of the exchange rate in the decline in the competitiveness of the Canadian manufacturing sector.

2 CHANGES IN THE MANUFACTURING SECTOR IN CANADA AND IN SELECTED INDUSTRIALIZED COUNTRIES

2.1 DECLINE OF THE CANADIAN MANUFACTURING SECTOR FROM 2000 TO 2011

The structure of the Canadian economy has undergone profound changes since the early 2000s. As Figure 1 shows, 2000 itself represented an important turning point for the Canadian manufacturing sector:[2] it was during this year that the sector's share of the Canadian economy reached a record high (18.4%).[3] This share then began to decline, to 12.8% in 2011. From 2000 to 2011, the manufacturing sector's real (inflation-adjusted) gross domestic product (GDP) fell by 1.4% per year, while real GDP for the Canadian economy as a whole rose by 1.8% annually.[4] From 1997 to 2011, the GDP of the manufacturing sector grew by 0.5% per year, compared with 2.6% for the entire Canadian economy.[5]

Figure 1 – The Real Gross Domestic Product (GDP) of the Manufacturing Sector Compared with the Real GDP of the Canadian Economy, 1997–2012



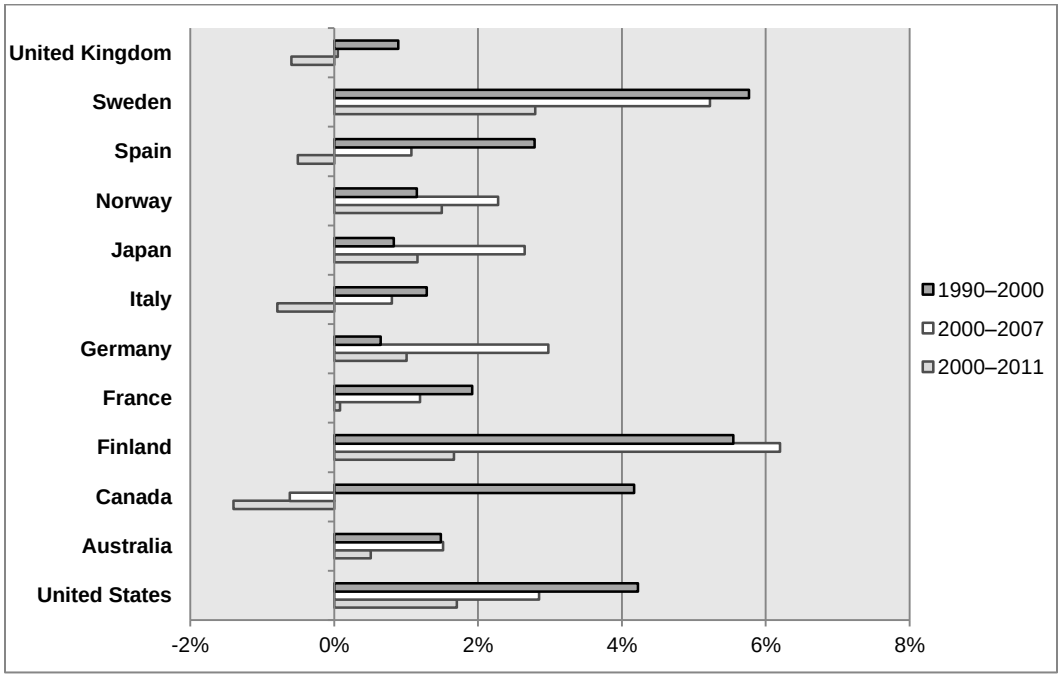
Source: Figure prepared by the author using data obtained from Statistics Canada, Table 379-0027, "Gross domestic product (GDP) at basic prices, by North American Industry Classification System (NAICS)."

The appendix shows the annual changes in GDP for the industries making up the Canadian manufacturing sector over the period 2000 to 2011. The figures in the appendix show that the only manufacturing industries that experienced positive annual growth over this period were food manufacturing, non-metallic mineral product manufacturing and machinery manufacturing. All of the other industries showed negative growth from year to year.

2.2 Changes in the Gross Domestic Product of Canada and Other Industrialized Countries

Figure 2 shows annual changes in the real GDP of the manufacturing sector in 12 industrialized countries (the "reference countries," which also appear in figures 3 to 6) during three specified periods (the "reference periods," which also appear in figures 3 to 6).

Figure 2 – Annual Changes in the Real Gross Domestic Product of the Manufacturing Sector in Selected Industrialized Countries, 1990–2000, 2000–2007 and 2000–2011



Note: Percentage changes have been calculated from data expressed in the national currency of each country.

Source: Figure prepared by the author using data from United States, Department of Labor, Bureau of Labor Statistics, "International Comparisons of Manufacturing Productivity and Unit Labor Cost Trends," *Economic News Release*.

From 1990 to 2000, with regard to annual growth in the real GDP of the manufacturing sector, Canada was at the front of the pack, running neck and neck with the United States and outpacing all of the other reference countries except Sweden and Finland. But from 2000 to 2011, Canada's manufacturing sector put in the poorest performance. In fact, from 2000 to 2007, Canada was the only country whose manufacturing shrank from year to year. From 2007 to 2011, the performance of the Canadian manufacturing sector was close to the average for the group of countries analyzed here.

This comparison shows that an analysis of the causes of this sector's performance in Canada should focus especially on the period 2000 to 2007. This period (and especially the years 2002–2007) saw sustained economic growth in Canada and worldwide, but during this same period, the GDP of Canada's manufacturing sector shrank, unlike the GDP of this sector in the other countries analyzed.

3 MEASURING THE COMPETITIVENESS OF THE MANUFACTURING SECTOR IN SELECTED INDUSTRIALIZED COUNTRIES

For some industries in the Canadian manufacturing sector, the causes of the decline in GDP from 2000 to 2007 are relatively easy to determine. Two factors that can be cited are the intense competition from emerging economies in several industrial sectors (textiles, electronic products, plastic products, etc.) and the structural decline in demand in some others (newsprint manufacturing, to name but one). However, the purpose here is not to review the causes of the decline in specific industries, but rather to examine the changes in the competitiveness of the manufacturing sector as a whole from 1990 to 2011.

3.1 COMPETITIVENESS

Competitiveness analysis is usually based on two distinct concepts: structural competitiveness and price competitiveness. In general, structural competitiveness is determined by factors unrelated to price, such as the specialization of the economy, technological innovation, the quality of distribution networks and a host of other factors that together define the conditions under which a given product is supplied.[6] Given its qualitative nature, comparative analysis of the structural competitiveness of various countries is a complex undertaking.

Price competitiveness, on the other hand, is measured using price differences or cost differences among producing countries. Comparative analysis of price competitiveness is therefore easier to perform than comparative analysis of structural competitiveness, because it can target one particular cost element for which data are available. For this reason, the price-based approach will be used in this analysis.

3.2 UNIT LABOUR COST

To examine the changes in the competitiveness of the Canadian manufacturing sector as a whole from 1990 to 2011, we will use unit labour cost (ULC), a measure of price competitiveness that represents the cost of labour per unit of output. A country's ULC is an important component of its price competitiveness, because labour accounts for a substantial share of the cost of companies' non-tradable production inputs (inputs not subject to international trade).[7]

Basically, ULC equals workers' nominal hourly compensation divided by their hourly productivity. The version of this formula used to calculate ULC for various countries in terms of a single unit of currency, such as the U.S. dollar, also takes the exchange rate into account:

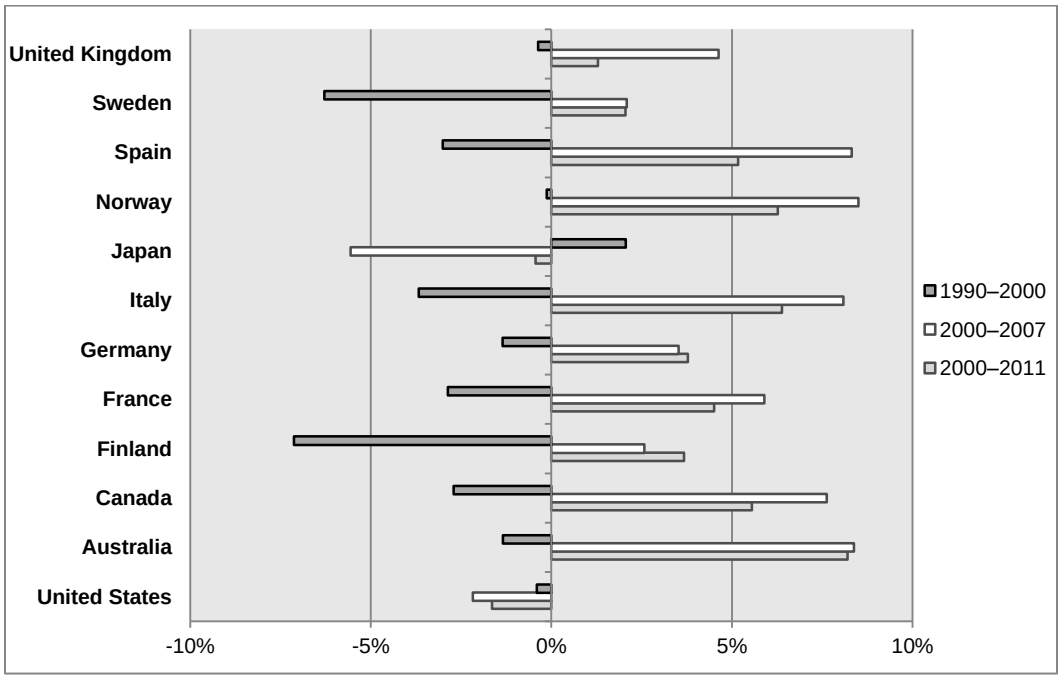
$$\text{ULC} = \frac{\text{Exchange rate} \times \text{Workers' nominal hourly compensation in their national currency}}{\text{Workers' hourly productivity}}$$

Thus we see that an increase in the hourly productivity of labour reduces the ULC and increases the competitiveness of a sector. But a rise in the exchange rate or in workers' nominal hourly compensation increases the ULC and reduces competitiveness.

3.3 Changes in Unit Labour Cost in Selected Industrialized Countries

Figure 3 shows the annual change in ULC (in U.S. dollars) in the 12 reference countries for the three reference periods mentioned earlier.

Figure 3 – Annual Change in Unit Labour Cost in Selected Industrialized Countries, 1990–2000, 2000–2007 and 2000–2011



Note: Percentage changes calculated from data expressed in U.S. dollars.

Source: Figure prepared by the author using data from United States, Department of Labor, Bureau of Labor Statistics, "International Comparisons of Manufacturing Productivity and Unit Labor Cost Trends," *Economic News Release*.

The ULC in Canada declined at an annual rate of -2.7% from 1990 to 2000, slightly more than the average of -2% for the other countries, then grew at a higher annual rate than the average for the other countries (7.6% compared with 4%) from 2000 to 2007. This rise in the ULC, which may be interpreted as a loss of competitiveness in the Canadian manufacturing sector, coincided with the decline in the manufacturing sector's GDP during this same period.

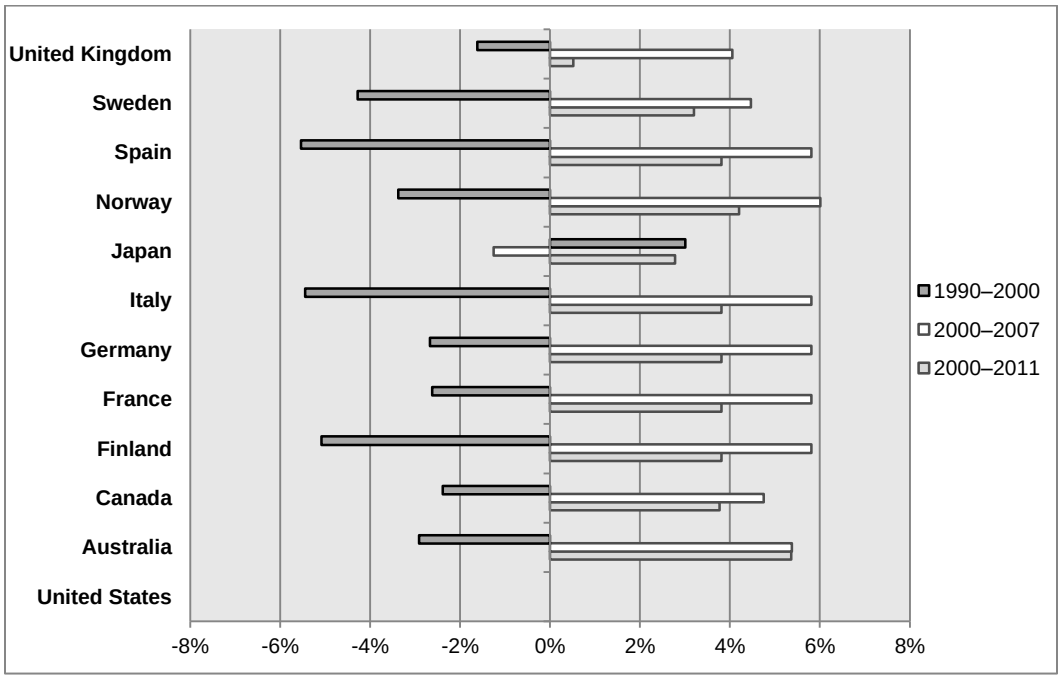
4 ANALYSIS OF THE FACTORS OF UNIT LABOUR COST IN SELECTED INDUSTRIALIZED COUNTRIES

As stated earlier, the ULC expressed in a common currency is influenced by three factors: the exchange rate, workers' nominal hourly compensation, and workers' hourly productivity. This section examines how these three factors have changed over time in Canada and in selected other industrialized countries.

4.1 Changes in the Exchange Rate Against the U.S. Dollar

Figure 4 shows how the exchange rates of the currencies of the 12 reference countries against the U.S. dollar have changed over the three reference periods.

Figure 4 – Annual Change in Exchange Rate Against the U.S. Dollar for the Currencies of Selected Industrialized Countries, 1990–2000, 2000–2007 and 2000–2011



Note: No data are presented for the United States, because the variation in the U.S. dollar against itself is of course nil.

Source: Figure prepared by the author using data from United States, Department of Labor, Bureau of Labor Statistics, "International Comparisons of Manufacturing Productivity and Unit Labor Cost Trends," *Economic News Release*.

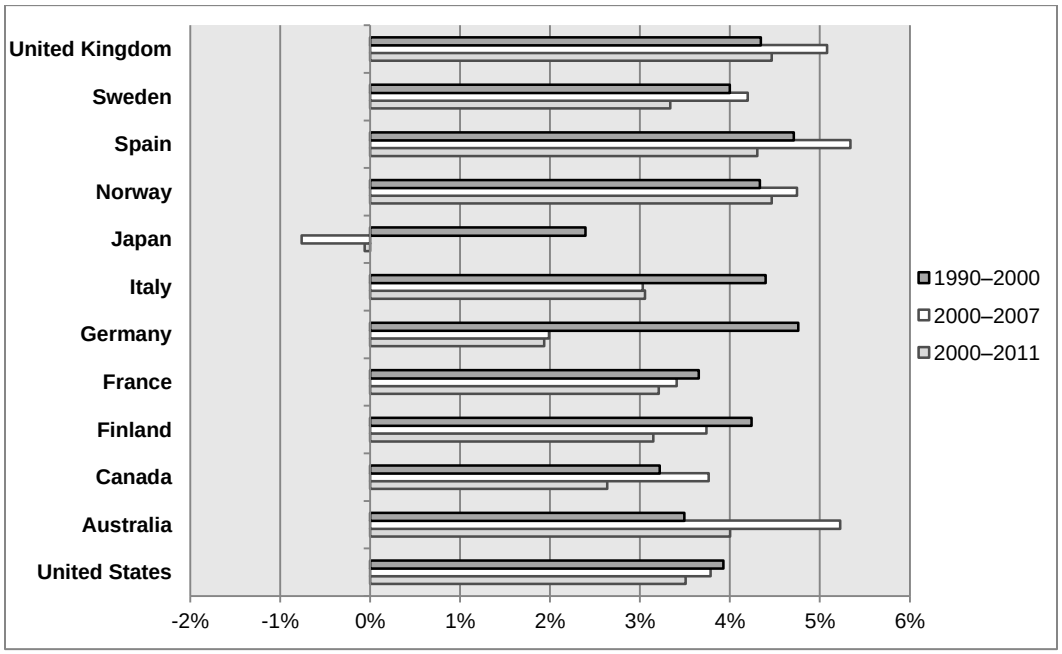
For all of the reference countries, Figure 4 shows a similar pattern in the movement of the exchange rate against the U.S. dollar.[8] From 1990 to 2000, the exchange rate for each of the national currencies fell; the value of the Canadian dollar declined by 2.4% per year, compared with an average annual decline of 3.1% for the other countries. From 2000 to 2007, the value of the Canadian dollar rose by 4.8% annually, which was exactly the average for the other countries.

In the context of discussions about the Dutch disease, some observers have cited the rise of the Canadian dollar against the U.S. dollar to explain the Canadian manufacturing sector difficulties. But as the data in Figure 4 demonstrate, the appreciation of the Canadian currency does not differ from that of the currencies of the other industrialized countries analyzed, except for Japan, whose currency experienced an annual decline against the U.S. dollar from 2000 to 2007.

4.2 Increase in Compensation

Figure 5 shows the changes in the nominal hourly compensation of workers in the 12 reference countries, in their respective national currencies, during the three reference periods.

Figure 5 – Annual Change in Workers' Nominal Hourly Compensation in the Manufacturing Sectors of Selected Industrialized Countries, 1990–2000, 2000–2007 and 2000–2011



Note: Changes calculated from data expressed in the national currency of each country.

Source: Figure prepared by the author using data from United States, Department of Labor, Bureau of Labor Statistics, "International Comparisons of Manufacturing Productivity and Unit Labor Cost Trends," *Economic News Release*.

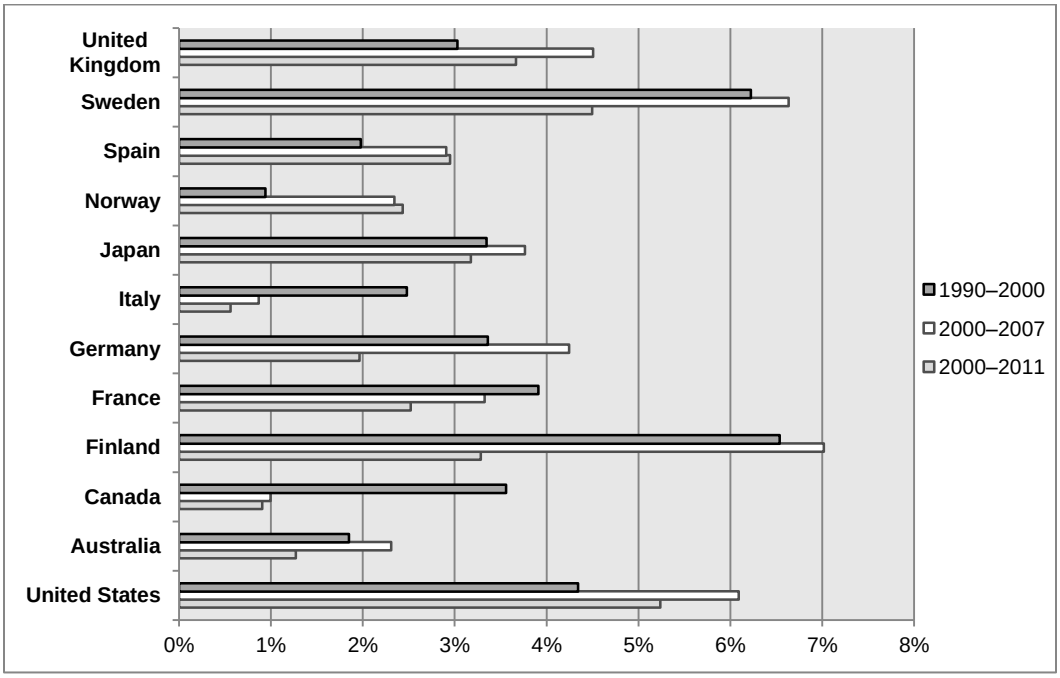
In general, the data show a similar trend from country to country. From 1990 to 2000, nominal hourly compensation grew by 3.2% annually in Canada, compared with an average of 4% in the other countries analyzed. From 2000 to 2007, compensation growth in Canada again fairly closely approximated the average for the other countries (3.8% compared with 3.6%). Japan was once more the exception: its workers saw a decrease in nominal hourly compensation from 2000 to 2011 (-0.1%) and from 2000 to 2007 (-0.8%).

Like the impacts of the exchange rate, the impacts of workers' nominal hourly compensation on the ULC were practically the same in Canada as in the other industrialized countries analyzed.

4.3 Productivity

The productivity of workers in the manufacturing sector is calculated by dividing total output by total hours worked. Figure 6 shows the changes in hourly productivity of workers in the manufacturing sector in the 12 reference countries over the three reference periods.

Figure 6 – Annual Change in Hourly Productivity of Workers in the Manufacturing Sector in Selected Industrialized Countries, 1990–2000, 2000–2007 and 2000–2011



Source: Figure prepared by the author using data from United States, Department of Labor, Bureau of Labor Statistics, "International Comparisons of Manufacturing Productivity and Unit Labor Cost Trends," *Economic News Release*.

From 1990 to 2000, annual productivity growth in Canada was close to the average for the other countries: 3.6% versus 3.5%. But from 2000 to 2007, annual productivity growth in Canada was well below the average for the other countries: 1% compared with 4%. During this period, annual productivity growth in Canada lagged far behind the figures of 6.1% in the United States, 6.6% in Sweden, and 7% in Finland.

5 CONCLUSION

The year 2000 marked a major turning point for the Canadian manufacturing sector: it was the year that the sector began its decline. From 2000 to 2007, Canada was the only one of the industrialized countries analyzed here that saw an annual decline in the GDP of its manufacturing sector. The year 2000 also marked a turning point for two factors in the ULC that have consequences for the competitiveness of the Canadian manufacturing sector: the exchange rate and productivity. Over the period from 2000 to 2007, the Canadian dollar appreciated strongly against the U.S. dollar, and the productivity of labour in Canada's manufacturing sector began to stagnate.

Nevertheless, the comparative analysis presented in this paper shows that the strengthening of the Canadian dollar against the U.S. dollar from 2000 to 2007 was not exceptional compared with the pattern for the currencies of the other industrialized countries. Hence, any analysis of the Dutch disease that refers only to factors inherent to the Canadian economy (in particular, the economic boom in

commodities) to explain the rise in the exchange rate – and, consequently, the difficulties experienced by the manufacturing sector – is probably incomplete. The factors that caused the U.S. dollar to fall against most of the other currencies in the industrialized world should also be taken into account.[9]

Notwithstanding the factors that caused the appreciation of the Canadian dollar (or the depreciation of its U.S. counterpart), Canada clearly has more to lose than other countries from a weakening in the competitiveness of its manufacturing sector – and its productivity – compared with its neighbour to the south, because the United States was the destination for 77% of Canadian manufacturing exports in 2011.[10]

NOTES

* Francis Perreault, formerly of the Library of Parliament, contributed to the writing of this document.

1. The “Dutch disease” is also known as the “Dutch syndrome.”
2. The manufacturing sector comprises the industries in categories 31 to 33 in the North American Industry Classification System (NAICS).
3. This was a record high share for the period from 1997 to 2011.
4. Economic activity in Canada is measured by its gross domestic product (GDP). Gross domestic product (GDP) measures an economy’s total output of goods and services in a given year.
5. Throughout this paper, the annual rates referred to are compound annual rates. The compound annual rate represents the average annual change between two points in time. This statistic differs from the average annual rate, because to calculate the compound annual rate, one needs only the figure for the start of the period and the figure for the end of the period, and no data points in between.
6. Thomas Hatzichronoglou, *Globalisation and Competitiveness: Relevant Indicators*, OECD Science, Technology and Industry Working Papers, 1996/05, OECD Publishing, 1996, p. 23.
7. To learn more about other components of competitiveness, see Richard Lewney et al., *The cost competitiveness of European industry in the globalisation era – Empirical evidence on the basis of relative unit labour costs (ULC) at sectoral level*, Industrial Policy and Economic Reform Papers, No. 15, European Commission, April 2012, p. 12.
8. Ibid.
9. This observation was made and tested empirically by Michel Beine, Charles S. Bos and Serge Coulombe, and presented in *Does the Canadian economy suffer from Dutch Disease?*, Center for Research in Economic Analysis Discussion Paper 2009-06, University of Luxembourg, April 2009.
10. Industry Canada, *Trade Data Online*.

APPENDIX – ANNUAL CHANGE IN REAL GROSS DOMESTIC PRODUCT IN THE CANADIAN MANUFACTURING SECTOR, BY INDUSTRY (2000–2011)

Industry	Compound Annual Change 2000–2011
Food Manufacturing [311]	1.7%
Beverage and Tobacco Product Manufacturing [312]	-3.0%
Textile Mills [313]	-7.8%
Textile Product Mills [314]	-6.5%
Clothing Manufacturing [315]	-9.2%
Leather and Allied Product Manufacturing [316]	-8.6%
Wood Product Manufacturing [321]	-0.8%
Paper Manufacturing [322]	-2.7%
Printing and Related Support Activities [323]	-2.1%
Petroleum and Coal Products Manufacturing [324]	-0.1%
Chemical Manufacturing [325]	-0.8%
Plastics and Rubber Products Manufacturing [326]	-1.3%
Non-Metallic Mineral Product Manufacturing [327]	0.6%
Primary Metal Manufacturing [331]	-0.5%
Fabricated Metal Product Manufacturing [332]	-1.3%
Machinery Manufacturing [333]	0.9%
Computer and Electronic Product Manufacturing [334]	-5.1%
Electrical Equipment, Appliance and Component Manufacturing [335]	-3.1%
Transportation Equipment Manufacturing [336]	-2.3%
Furniture and Related Product Manufacturing [337]	-4.0%
Miscellaneous Manufacturing [339]	-0.1%

Note: The numbers in square brackets are the codes for these industries under the North American Industry Classification System (NAICS) Canada 2012.

Source: Statistics Canada, Table 379-0027, "Gross domestic product (GDP) at basic prices, by North American Industry Classification System (NAICS)."