

**WILL THE HIGHER DOLLAR MAKE
CANADIANS MORE PRODUCTIVE?**

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WILL THE HIGHER DOLLAR MAKE CANADIANS MORE PRODUCTIVE?

INTRODUCTION

Canada's productivity performance has been the subject of considerable attention in recent years. Since the mid- to late 1990s, evidence that productivity growth in Canada lagged behind that of the United States has led to concerns that the competitiveness of the Canadian economy is being eroded and that, unless the productivity gap is addressed, Canada will experience a long-run decline in its standard of living relative to that of the United States.

Despite the widening productivity gap between Canada and the United States, the Canadian economy was strong in the late 1990s and into the present decade. A falling Canada-U.S. exchange rate more than compensated for superior U.S. productivity levels by lowering the price of Canadian goods in the U.S. market. As a result, Canadian products continued to be competitive, and in fact became even more competitive in the U.S. market.

Nonetheless, a number of analysts have suggested that the Canadian dollar's decline during the 1990s was in fact detrimental to the long-run health of the Canadian economy. Since the falling dollar more than compensated for the widening Canadian productivity gap in recent years, Canadian producers were sheltered from bearing the costs of their lower productivity levels. From that perspective, the recent rapid appreciation of the Canadian dollar – which gained over 20% against the U.S. dollar in 2003 – is an opportunity for the Canadian economy to address the productivity issue head-on, without relying on an ever-weakening currency to keep it afloat.

Although the premise that a rising Canadian dollar is productivity-enhancing is common and gaining in popularity, there is little empirical evidence to support it. Economists generally agree that productivity growth can have a positive effect on the exchange rate, but there is less agreement that the reverse is also true. Furthermore, even among those who believe that the exchange rate affects productivity growth, there is disagreement on the direction of the effect. Some economists believe that it is, in fact, a *falling* Canadian dollar that has the potential to be productivity-enhancing.

This paper examines the relationship between productivity growth and the Canadian dollar. It outlines the arguments supporting the hypothesis that a rising dollar can boost productivity, and also explores why many economists disagree with that view. It finds that although many analysts claim that a rising dollar will force Canadian manufacturers to be more productive, the evidence on that front is far from conclusive. In other words, Canadians should not look to the exchange rate as a solution to the productivity gap between Canada and the United States.

THE PRODUCTIVITY ISSUE

A. What Is Productivity and Why Is It Important?

Productivity is perhaps the single most important determinant of long-run economic growth and prosperity. Simply put, productivity refers to the levels of inputs and resources used to produce a given quantity of output. In essence, it measures the efficiency with which labour, capital, natural resources, technology and knowledge are combined to create economic value.⁽¹⁾ Productivity levels are said to be improving if the amount of input per unit of output falls over time.

The significance of productivity gains is fairly straightforward. If more is produced with the same (or fewer) inputs, then the total cost of production falls and more resources are available for use elsewhere in the economy. This improves a society's capacity to produce and lowers the price of goods and services. It is estimated that two-thirds of Canada's output growth since 1946 can be directly attributed to productivity increases.⁽²⁾

B. How Is Productivity Measured?

There are two principal ways of measuring productivity. The first is total factor productivity (TFP); the second is labour productivity. The former is the more comprehensive measure. TFP is typically estimated using economic models in which production depends on

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- (1) D. Shaw, *Canada's Productivity and Standard of Living: Past, Present and Future*, PRB 02-23E, Parliamentary Research Branch, Library of Parliament, Ottawa, October 2002, p. 4.
- (2) A. Sharpe, *Why Are Americans More Productive Than Canadians?* Research Report 2003-03, Centre for the Study of Living Standards, Ottawa, June 2003, p. 7.

two inputs: labour and capital.⁽³⁾ Increasing the amount of either (or both) of those inputs is assumed to increase total output. In these models, productivity gains are made when the quantity of output that can be produced with *any* combination of labour and capital increases. In other words, an increase in capital is not productivity-enhancing in and of itself. It is the way in which that capital is used that is important. TFP is most closely analogous to a measure of technological change or innovation.

Labour productivity, on the other hand, determines the output that can be produced with a given amount of labour. It is usually calculated in one of two ways: gross domestic product (GDP) per worker, or GDP per hour worked. Labour productivity is not, strictly speaking, a true measure of the productive use of all inputs, because it interprets an increase in the quantity of capital as productivity-enhancing. Employing more capital is not inherently productive, since both the type of capital and the way in which it is used affect overall productivity levels.

Nevertheless, labour productivity is the more widely used of these two measures, particularly in non-academic discussions. It is theoretically less precise and less comprehensive than TFP, but it is more easily and more accurately measured.⁽⁴⁾ It can also be shown to be a direct determinant of GDP per capita – a common, if imperfect, proxy measure of living standards. Since labour productivity statistics are most commonly cited in discussions of Canada's relative productivity performance, they will be used in this paper.

CANADA'S PRODUCTIVITY PERFORMANCE

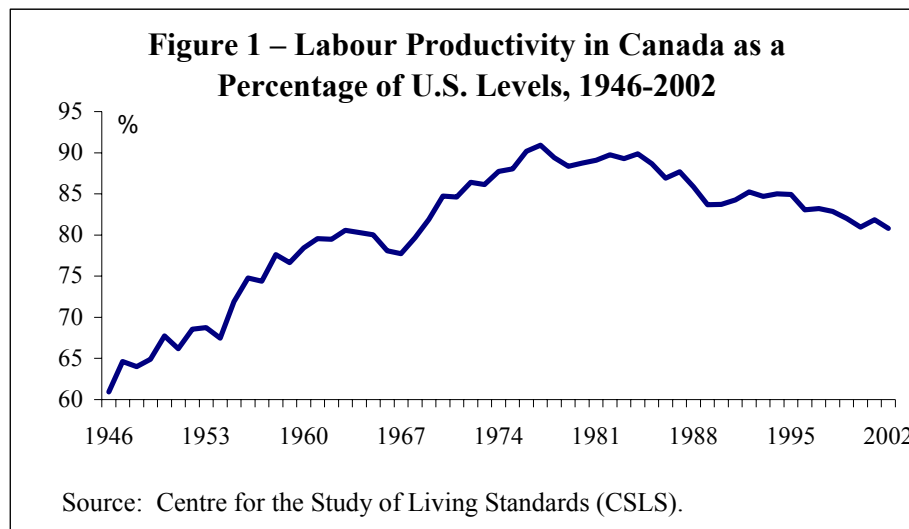
On the whole, Canada has enjoyed remarkable gains in productivity since the end of World War II. From 1946 to 2002, labour productivity in Canada grew by an average of 2.5% per year, compared to 2.0% growth in the United States. As a result, the productivity gap between Canada and the United States is considerably narrower today than it was in the mid-1940s. In 1946, labour productivity in Canada – as measured by output per hour worked –

(3) In these types of models, capital is usually defined broadly to include all non-labour factors of production such as machinery and equipment, land, natural resources, etc.

(4) Estimates of TFP require detailed analysis and interpretation of the relative intensity of labour and capital usage. Furthermore, a multitude of different economic production function models are used to estimate TFP, and there is no clear consensus on which is the most accurate.

was only 61% of the U.S. level. By 2002, Canadians were 84% as productive as their U.S. counterparts.⁽⁵⁾

Although overall growth has been strong, Canada's productivity record since 1946 can be divided into two distinct periods. In the immediate post-war period and extending to the mid- to late 1970s, the Canadian economy enjoyed remarkable productivity growth. On average, labour productivity grew by 3.6% per year from 1946 to 1977, far exceeding the average annual growth of 2.3% in the United States over that time. By 1977, productivity in Canada was 91% of the U.S. level.



Beginning in the late 1970s, however, productivity growth in Canada began to slow. For the next 25 years, labour productivity increased by an average of about 1.2% per year. While productivity growth in the United States slowed as well, the decrease was far less acute. Given that Canada has been unable to match productivity growth in the United States, its relative productivity position has been declining steadily since 1977.

Although the bulk of the decline in Canada's relative productivity performance came in the mid- to late 1980s, the Canada-U.S. productivity gap became a major issue only in the late 1990s. At that time, the boom in high-tech industries in the United States led to large productivity gains in the business sector, while Canada's business sector productivity growth

(5) All productivity data cited in this publication are from the Centre for the Study of Living Standards (CSLS). Data on labour productivity refer to real output per hour worked (i.e., taking into account the effects of inflation) in U.S. dollars.

remained sluggish. As a result, the gap in business sector productivity in the two countries has widened considerably in recent years.⁽⁶⁾

THE RELATIONSHIP BETWEEN PRODUCTIVITY AND THE CANADIAN DOLLAR

It is a widely accepted economic theory that productivity and exchange rates are related. When inflation in two countries is about the same and productivity growth in one is higher than in the other, then it is expected that, over time, the currency of the country with superior productivity growth will strengthen relative to the currency of the other.⁽⁷⁾ In other words, productivity is widely believed to influence exchange rates.

This relationship between productivity and the exchange rate was especially apparent in Canada and the United States in the 1990s. Empirical evidence shows that higher productivity growth in the United States contributed to the decline in the Canadian dollar over that period.⁽⁸⁾ Even a cursory overview of the data shows that the decline in the Canada-U.S. exchange rate since 1995 coincided with a widening labour productivity gap in the business sector.

The notion that the causal relationship between productivity and the exchange rate may work also in reverse – that exchange rates affect productivity growth – follows out of a number of theoretical economic models and other, more anecdotal arguments. However, these models and economic arguments do not agree on the direction of that supposed relationship: assuming the Canadian dollar does affect productivity growth, is it a rising or a falling exchange rate that results in productivity gains? Some models suggest one, some the other. In a few cases, both are possible.⁽⁹⁾ Although there are arguments in support of both positions, neither the theoretical nor the empirical evidence is conclusive on this topic.

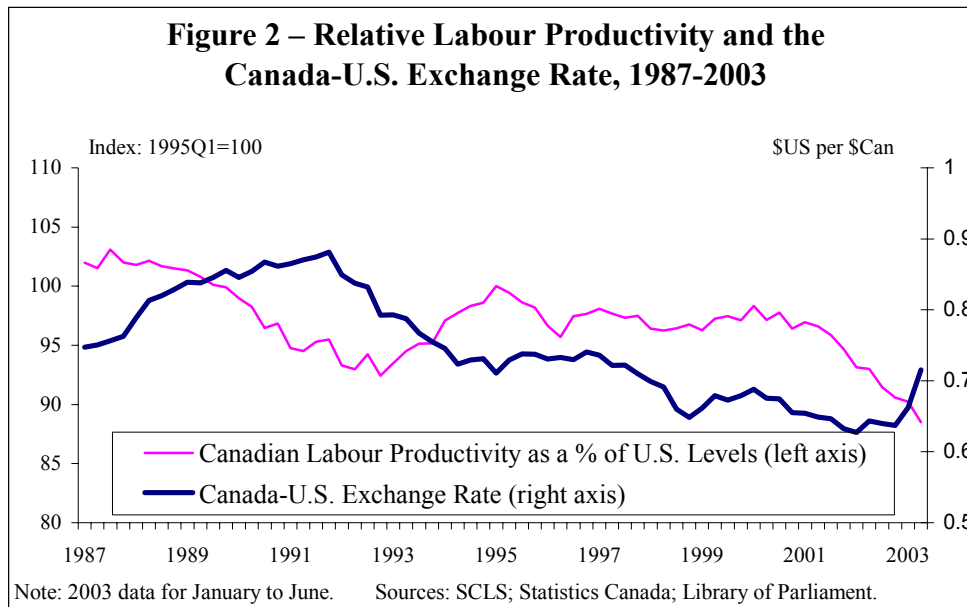
(6) Recently revised data show that for the economy as a whole, labour productivity in Canada did not, in fact, deteriorate relative to that of the United States over the past 10 years. However, the productivity gap did widen in some key sectors of the economy, notably manufacturing.

(7) D. Laidler and S. Aba, *Productivity and the Dollar: Commodities and the Exchange Rate Connection*, Commentary 158, C. D. Howe Institute, Toronto, February 2002, p. 3. This statement is true assuming flexible exchange rates. Under a fixed exchange rate system, inflation would be higher in a country that has low productivity growth.

(8) *Ibid.* This is not to suggest, however, that productivity differentials were the sole, or even a significant, factor behind the decline in the Canadian dollar in the past decade. Other factors such as declining commodity prices and interest rate differentials played a greater role.

(9) For example, a falling exchange rate could yield short-term productivity gains, while the benefit from a rising dollar would be felt in the longer term.

This is evident from even a cursory examination of the trends in the two variables since the late 1980s. From 1987 through 1991, the Canadian dollar appreciated strongly against the U.S. dollar, even though relative business sector productivity in Canada slumped during those years. Over the following 11 years, the Canada-U.S. exchange rate fell steadily while relative productivity levels in Canada rose in the early to mid-1990s, were stable through to 2001 and began to fall dramatically in 2002.



Nevertheless, the view that it is a rising dollar that is productivity-enhancing – and, conversely, that a falling dollar is detrimental to productivity growth – enjoys more popular support in the public policy debate. This claim is based on two somewhat complementary explanations. The arguments supporting and opposing each are discussed below.

A. The Complacent Manufacturers Hypothesis

The first mechanism is the exchange rate sheltering hypothesis, also known as the “complacent manufacturers hypothesis.” When the exchange rate falls, it lowers the price of Canadian products on the international market, making them more competitive relative to similar goods and services produced abroad. Since Canadian firms are better able to sell abroad and be profitable based on a weak Canadian dollar, supporters of this hypothesis maintain that the lower exchange rate reduces the incentive to make productivity-enhancing investments because those investments are not necessary to maintain international competitiveness. It is argued that over

time, firms would grow to rely on a weak currency to maintain their relative competitive advantage, and productivity would suffer.

The complacent manufacturers hypothesis has frequently been offered as an explanation for Canada's relatively poor productivity record through the 1990s, particularly late in the decade. Consequently, the rise in the Canada-U.S. exchange rate in 2003 is being hailed by proponents of this hypothesis. Since firms are no longer as sheltered by the low Canadian dollar, they will be forced to compete with U.S. companies on a more equal footing. The prospect of increased competition intensifies the need to make productivity-enhancing investments.

Although the exchange rate sheltering hypothesis is a popular one, many economists consider it to be theoretically untenable.⁽¹⁰⁾ They point out, for example, that the entire premise runs contrary to one of the most basic principles of microeconomic theory: that firms are profit-maximizing.⁽¹¹⁾ As Gordon Thiessen, former governor of the Bank of Canada, stated, "If you accept this [complacent manufacturers] argument, it has some extremely worrisome implications for the state of corporate attitudes and corporate governance in Canada ... Are Canadian boards of directors really content not to try to maximize the returns to the shareholders they represent?"⁽¹²⁾ Furthermore, some economists have suggested that if the exchange rate sheltering hypothesis were true, it would imply questionable policy prescriptions. Specifically, if the effects of a high Canadian dollar (increased international competition and lower export revenues) did in fact force firms to be more productive, this same objective could be accomplished by simply raising corporate tax rates to highly uncompetitive levels – for manufacturers' own good.

Another criticism of the complacent manufacturers hypothesis is that it ignores domestic competition. While it is true that a lower dollar makes Canadian firms more competitive relative to their counterparts in other countries, it does not affect their competitive position with respect to one another. The complacent manufacturers hypothesis assumes that all Canadian firms react the same way to the declining dollar. In reality, however, each firm still has a strong incentive to innovate in order to gain an advantage over its domestic competitors.

(10) See, for example, R. Lafrance and L. Schembri, "The Exchange Rate, Productivity, and the Standard of Living," *Bank of Canada Review*, Winter 1999-2000, pp. 17-28.

(11) The notion that firms may not be profit-maximizing but rather are seeking an acceptable level of income in exchange for not working too hard is called "satisficing."

(12) Speech to the Institut économique de Montréal, 30 May 2002, available on-line at: http://www.iedm.org/mcteerc_fr.html.

Furthermore, when the Canadian dollar is undervalued, as many economists believe it was in the late 1990s and up to 2002, Canada becomes an attractive destination for foreign direct investment (FDI).⁽¹³⁾ A weak exchange rate makes it cheaper for foreigners to acquire Canadian capital and lowers the price of Canadian labour relative to foreign labour. If, on top of that, domestic Canadian companies were complacent and not innovating, foreign companies would have a strong incentive to locate operations in Canada to compete directly with inefficient Canadian producers. These companies bring their own machinery, equipment, technology and process innovations, opening the door for labour productivity gains in Canada.

The final argument against the complacent manufacturers hypothesis is that it is not consistent with the evidence on why Canada's overall productivity growth has lagged behind that of the United States. If that theory held, it would be expected that the productivity gap would be widely dispersed across all exporting industries. However, research shows that the remarkable productivity gains made in the United States over the 1990s and up to today have been concentrated in only two industries: machinery and equipment, and the high-tech sector. Not only has U.S. productivity growth in those areas vastly exceeded productivity growth in Canada, but those industries make up a greater proportion of total economic activity in the United States compared to Canada. Aside from those two industries, however, Canadian productivity growth has been comparable to, or greater than, growth in the United States.

B. The Factor Price Hypothesis

While the complacent manufacturers hypothesis is dismissed as implausible by most economists, the second possible way in which a higher dollar could be productivity-enhancing – the factor price hypothesis – is more widely accepted. In Canada, up to 80% of the machinery, equipment and software used in production processes is imported from the United States.⁽¹⁴⁾ A higher dollar lowers the cost of importing these capital goods while leaving the cost of labour unaffected. According to the factor price hypothesis, since the relative price of capital inputs (to labour inputs) is lower when the exchange rate is higher, a substitution effect would take place over time. The use of (imported) capital would increase, labour intensity would decrease and labour productivity would rise.

(13) This view presupposes that the exchange rate will remain stable or rise to the point that it is no longer undervalued. A low and falling exchange rate will deter FDI because it erodes the value of foreigners' profits in their domestic currency.

(14) Standing Senate Committee on Foreign Affairs, *The Rising Dollar: Explanation and Economic Impacts*, Final Report, Ottawa, November 2003, p. 23.

Supporters of the factor price hypothesis point to Canada's strong labour market performance since the late 1990s as evidence of the theory in action. As the Canadian dollar fell, demand for Canadian products increased, as did the cost of capital inputs. As a result, the use of labour in production increased. From 1999 to 2002, the Canadian economy created close to 881,000 new jobs – an annual rate of increase of 2.0%. By comparison, just under 3.0 million new jobs were created in the United States over the same period, equivalent to only 0.7% growth per year.

Some see this robust job creation record as a factor in Canada's poor labour productivity performance. As labour became relatively cheap, employers went on a hiring spree, particularly in the manufacturing sector. Now that a higher dollar has raised the price of labour (relative to imported capital), some expect this situation to reverse itself. Employers will shed jobs in an effort to lower costs and improve productivity and efficiency.⁽¹⁵⁾

The exchange rate can affect not just the intensity of capital use in the Canadian economy, but the quality of capital as well. As mentioned above, the productivity gap between Canada and the United States in the past 10 years was due primarily to growth in the U.S. machinery and equipment manufacturing sector and in the high-tech sector. These industries are not only responsible for the manufacture of productivity-enhancing investment goods, but are themselves U.S. leaders in investment and innovation. Given the recent advances in computers, software and related technologies, it is hardly surprising that these industries would realise significant productivity gains through the application of their own products.

In Canada, the weak exchange rate in recent years may have contributed to the slow productivity growth in Canadian high-tech industries by reducing their ability to invest and (thus) capacity to innovate.⁽¹⁶⁾ Indeed, the innovation gap between Canada and the United States is frequently cited as an explanation for the diverging productivity growth records of the two countries. In a higher-dollar environment, the cost of high-tech investment is expected to fall, and may help close the innovation gap between the two countries.

Although support for the factor price hypothesis is more widespread than for the exchange rate sheltering hypothesis, it too has its critics. There is no disputing that a higher

(15) There has been little evidence to support this belief thus far. Despite the much higher Canadian dollar, employment in Canada grew by 2.2% in 2003, about the same rate as a year earlier.

(16) This assumes that Canadian high-tech companies acquire investment and innovations from abroad. For firms that do research and development work in Canada and export those products to their manufacturing concerns abroad, a weak exchange rate is in fact beneficial.

exchange rate lowers the cost of importing productivity-enhancing capital goods. However, this aspect of the exchange rate effect must be viewed in the context of its wider effect on exports and production in general. Specifically, business revenues and corporate profits of exporting firms are inversely related to the exchange rate. If exports become less competitive because of a higher exchange rate, then revenues and corporate profits fall, meaning that firms are less able to afford to make capital investments, even if the exchange rate has lowered the effective price of those investments. Conversely, a low Canadian dollar increases firms' profitability (because they can sell more exports), giving them the financial capacity to make productivity-enhancing investments, even though they are more expensive. In other words, the positive effect that a high dollar might have on the cost of capital investment is at least partially offset by its concurrent effect on corporate profits.⁽¹⁷⁾

In fact, some economists point out that in the short term, a low dollar may in fact be productivity-enhancing. A significant drop in the Canadian dollar increases aggregate demand for domestic goods through the export market. This in turn raises productivity levels by boosting factor utilization rates (i.e., running plants at full capacity), increasing learning-by-doing effects (the "Verdoon hypothesis") and/or through increasing economies of scale. Many economic growth models predict such a response to an exchange rate shock, although the effect is usually considered to be temporary.

CONCLUSION

There are a number of different theories on how the strength or weakness of the Canadian dollar might affect national labour productivity, but empirical evidence on the matter is far from clear. Indeed, not only is there disagreement on whether a high or a low dollar is productivity-enhancing; studies have also admitted that it is impossible to prove conclusively that there is any causal relationship linking exchange rate movements to changes in productivity.⁽¹⁸⁾

(17) The net effect on producers depends on the extent to which their profits come from the export market.

(18) See R. Harris, *Is There a Case for Exchange Rate Induced Productivity Changes?* Department of Economics, Simon Fraser University and Canadian Institute for Advanced Research, revised June 2001. This point was also made by J. Anania, C. Gomez and A. Seychuk, "Hidden Benefits of a Stronger Canadian Dollar," *Current Analysis*, Economics Department, RBC Financial Group, Toronto, May 2003.

Researchers on productivity have identified a number of major factors known to affect national productivity growth and performance. The list includes investment in research and development, innovation and technology adoption, industrial structure, firm size, and others.⁽¹⁹⁾ While the exchange rate may perhaps affect productivity growth indirectly through its influence over these factors – by limiting the ability to purchase new equipment with which to innovate, for example – it is certainly not the chief determinant of productivity performance.

All this is to say that even if the Canadian dollar does affect productivity growth – and it remains unclear whether it does, or even how – then the impact is marginal at best. However, the importance of addressing Canada’s long-standing productivity gap relative to the United States should not be overlooked in this debate. Strong productivity growth in Canada will have considerable benefits for the Canadian economy, increasing firms’ profitability and competitiveness and paving the way for long-term wage and employment gains. Indeed, if the fundamental issue of Canada’s productivity gap is addressed, then the matter of whether and how the exchange rate affects productivity growth becomes essentially irrelevant.

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(19) An explanation of the factors contributing to the Canada-U.S. productivity gap can be found in Sharpe (2003).

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