DID THE CANADA - U.S. FREE TRADE AGREEMENT AFFECT ECONOMIC INTEGRATION?

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Abstract

This paper assesses the nature and degree of bilateral economic integration preceding and following the implementation of the Canada-U.S. Free Trade Agreement (CUSTA). Various price-based and quantity-based indicators of economic integration are used to measure the impact of the CUSTA on bilateral integration. On balance, the results provide modest evidence of incremental integration in the post-CUSTA period. However, the observed patterns of integration are not obviously related to the implementation of CUSTA. Suggestive evidence implicates Canada's fluctuating exchange rate regime and increased exchange rate volatility post-CUSTA as possible factors mitigating policy initiatives such as CUSTA.

INTRODUCTION

Canadian government officials, business executives and non-government policy experts have recently called for new steps towards broadening and deepening economic integration between Canada and the United States (McKenna, 2000). Some proposals suggest that traditional trade and investment liberalization initiatives as embodied in historical agreements such as the Canada-U.S. Free Trade Agreement (CUSTA) and the North American Free Trade Agreement (NAFTA) need to be augmented by new instruments of integration (Weintraub, 2002 and Hakim and Litan, 2002). Suggested instruments include: eliminating all remaining restrictions on foreign direct investment between Canada and the United States, providing for freer movement of labour, and, quite prominent, establishing a single North American currency.[1]

Evaluating proposals to promote further economic integration between the Canadian and U.S. economies would presumably benefit from an evaluation of recent patterns of economic integration in North America. In particular, it might be informative to identify and assess whether and to what extent recent patterns of economic integration are related to the implementation of CUSTA and NAFTA. To the extent that the implementation of those agreements has had little impact on bilateral economic integration, policymakers might look towards less "traditional" initiatives, possibly including a new regional currency regime.

The purposes of this paper are to assess the nature and degree of bilateral economic integration preceding and following the implementation of the CUSTA, and to assess the impact of the CUSTA on bilateral integration. Various measures of economic integration are utilized, and the measures, on balance, provide modest evidence of incremental integration in the post-CUSTA period. However, the observed patterns of integration are not obviously related to the implementation of CUSTA.

While no systematic effort is made to identify the factors affecting relative integration over time, suggestive evidence implicates Canada's fluctuating exchange rate regime as a possible factor mitigating policy initiatives such as CUSTA. Specifically, the

[1] Proposals for a common currency between Canada and the United States can be found in Harris (2000) and Grubel (1999). Related proposals call on Canada to adopt the U.S. dollar unilaterally as its domestic currency unit.

Canada-U.S. exchange rate became significantly more volatile in the post-CUSTA period, and existing evidence points to the discouraging effect that fluctuating exchange rates have on trade and capital flows, as well as on cross-border price convergence.

The paper proceeds as follows. Section 2 discusses alternative measures of economic integration and reviews a number of existing studies that focus on one or another of those measures in the Canada-U.S. context. Section 3 presents our own analysis of bilateral economic integration before and after the implementation of CUSTA. Potential explanations of the patterns identified in Section 3, particularly the behaviour of the Canada-U.S. exchange rate, are considered Section 4. The final section presents a summary and policy conclusions.

MEASURING ECONOMIC INTEGRATION

Economists and international business scholars employ both *de jure* and *de facto* definitions of economic integration. The former focuses on the comprehensiveness of legal arrangements between countries designed to liberalize international trade, investment and labour flows. The latter focuses on a range of actual macroeconomic variables, as well as statistical results from so-called gravity models.[2]

De Facto Measures

In fact, *de facto* measures of economic integration tend to dominate in empirical studies. In particular, trade and FDI flows are, by far, the most ubiquitous measures of economic integration, although increasing attention is being paid to the cross-border migration of skilled workers.[3] Thus, Hufbauer (2001) cites growing *absolute* trade and FDI flows between Canada and the United States subsequent to the implementation of CUSTA as illustrative of convergence between the two economies. Rugman (2000) also highlights flows of exports from Canada and Mexico to the United States as indicators of

[2] Gravity models identify the expected magnitude of trade and foreign direct investment (FDI) flows between countries given underlying "generic" determinants of such flows. Differences between expected and actual magnitudes of trade and FDI are identified as "border barriers." Changes, over time, in the quantitative importance of border barriers are taken to represent changes in economic integration.

[3] See, for example, DeVoretz and Coulombe (2002) and Globerman (2000).

regional economic integration, along with growing *absolute* U.S. FDI stocks in Canada and Canadian FDI stocks in the United States.[4]

Trade, FDI and even migration flows are quantity-based measures of cross-border economic activity that are, in turn, potentially related to specific policy initiatives. The behaviour of prices has also been employed as a measure of economic integration. Specifically, as barriers to the movement of inputs and final outputs between members of a regional trading arrangement are reduced or eliminated, there should be an intensification of trade among member countries. In the neoclassical economic model, an intensification of trade should lead to an equalization of prices net of transport costs and taxes (Hine, 1994). Furthermore, since trade is a substitute for factor movements in the neoclassical model, increased trade should also lead to a convergence of wages and returns to capital within the region. To the extent that direct factor movements are stimulated by differences in wage rates and rates-of-return, increased cross-border flows of capital and labour, perhaps facilitated by formal trade agreements, should further contribute to a convergence of returns to factors of production within the integrating region.

Is there any reason to favour quantity or price-based measures of economic integration? The theory of contestable markets suggests that price convergence is perhaps a more generally relevant indicator of regional economic integration than are quantity flows of outputs and inputs. Specifically, the theory of contestable markets makes the fundamental point that the *threat* of substantial new entry into domestic industries can cause monopoly prices to decline to competitive levels without actual entry taking place. Moreover, the threat of new entry can lead to reductions in *X-inefficiency* or higher than necessary costs that, in turn, are encouraged by the protection from more efficient competitors enjoyed by incumbent producers. In the extreme, the threat of new competition from imports can promote significantly lower prices in domestic markets without any significant increases in import volumes.

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[4] Absolute quantities of trade and FDI are potentially misleading indicators of economic integration to the extent that overall economic activity (both domestic and international) is increasing faster than trade and FDI. Similarly, larger bilateral trade and FDI flows may be misleading indicators of bilateral economic integration to the extent that trade and FDI flows between each of the bilateral partners and non-bilateral partners are increasing even more. This observation suggests a focus on relative bilateral trade and FDI flows.

As a consequence of this insight, as well as the fact that much less attention has been paid to price-based measures of regional economic integration, we focus particular attention upon that measure of bilateral economic integration; however, we also address and assess measures of output and input flows between Canada and the United States.

Gravity Models and Other Evidence

In this section, we review some existing evidence of North American economic integration drawn from gravity models. The relevance of gravity models derives from our earlier observation that changes in absolute quantity flows are potentially misleading indicators of changes in economic integration, because they fail to standardize for changes in generic determinants of trade flows, including economic growth in the region under consideration. Gravity models effectively hold constant the influence of economic growth on trade flows so that the impact of relevant trade agreements on trade flows can be identified.[5] In this regard, Lee (2002) reviews a number of statistical studies suggesting that the buoyant U.S. economy and the depreciation of the Canadian dollar were mainly responsible for a dramatic increase in Canadian exports to the United States in the 1990s. The CUSTA and NAFTA Agreements, in contrast, are estimated to have increased Canadian exports to the United States by only around 9 percent.

Estimates of so-called border effects build upon the structure of gravity models by comparing trade flows across countries or regions to flows within countries or regions where the "potential" volume of trade is effectively identified through standard structural models. McCallum (1995) and Helliwell (1998) document the existence of substantial border effects in the Canada-U.S. context. Simply put, there is much less North-South trade relative to intra-Canada trade than one would expect given the size of the U.S. economy relative to provincial economies in Canada. Helliwell examines the impact of the CUSTA on border effects for Canada's trade flows. His estimates cover the period 1988-1996. He finds that the average border effect was constant from 1988-1990 and then fell substantially from 1990-1993. The border effect in 1996 was the same as in 1993 and about 60 percent of the estimated 1990 value.

Interestingly, Helliwell also finds that export border effects fell more than import border effects over the sample period. Given the lower average tariff levels in the U.S.

[5] A technical discussion of gravity models and their interpretation can be found in Helliwell (1998).

compared to Canada in the period immediately preceding CUSTA, one would have expected the direction of the relative border effect change to be the opposite of what Helliwell finds. That is, one might have expected a greater relative increase in trade going from the U.S. to Canada. The inference one might draw from Helliwell's study is consistent with Lee's (2002) previously cited conclusion. Namely, that the CUSTA, *per se*, has been, at best, a modest factor influencing bilateral trade flows with other, more important factors strongly encouraging increased Canadian goods shipments to the United States.

Gravity-type models have also been used to estimate the impact of formal trade agreements on FDI flows. In the relevant FDI models, national or regional GDP variables are used to standardize for the influence of private sector determinants of FDI flows. Several studies identify a potential influence of CUSTA and NAFTA on bilateral FDI flows. For example, Buckley, Clegg, Forsans and Reilly (2000) find that U.S. FDI into Canada was encouraged by the two formal trade agreements, although changes in the exchange rate also fostered FDI. Globerman and Shapiro (1999) identify an increase in Canadian inward and outward FDI flows in the period subsequent to CUSTA (including the period covered by NAFTA) holding other determinants of FDI flows constant. Outward flows are larger than inward flows; however, there are reasons to doubt whether the CUSTA and NAFTA, *per se*, explain the increase in outward FDI, since growth in outward FDI from Canada was primarily directed at Western Europe in the late 1980s and early 1990s. Eden and Monteils (2000) are also skeptical about the impact of the formal free trade agreements on the magnitude of bilateral FDI flows. Specifically, they conclude that MNCs making intra-regional foreign investments in North America engaged in "locational reshufflings" as they rationalized their investments on a continental basis.

In summary, a number of existing studies identify the influence of the CUSTA and NAFTA on trade and FDI flows holding constant other influences on trade and FDI. By and large, those studies find only a modest impact of the formal trade agreements on bilateral economic integration.

QUANTITY FLOWS AND PRICE CONVERGENCE

In this section, we present and discuss descriptive data on relative bilateral quantity flows and price comparisons as indicators of changes in bilateral economic integration.

Trade, FDI and Labour Flows

The previously cited findings of statistical models are largely supported by the summary data reported in Tables 1-4. Specifically, Table 1 shows that Canada was a marginally more important trading partner for the United States during the period 1996-2001 compared to 1980, with essentially no change in Canada's relative importance between 1981 and 2001. Table 2 shows that the share of exports from Canada going to the U.S. increased consistently between each of the five-year periods from1980 to 2001. The table shows a particularly marked increase in the post-1990 period. The U.S. share of Canadian imports increased modestly in the latter half of the 1990s after declining over the period 1986-1995. The main observed change in bilateral trade patterns, therefore, is a major increase in Canadian exports to the U.S. Other dimensions of bilateral trade changed only modestly in the post-CUSTA period (post-1989).

The data reported in Table 3 suggest that Canada's share of the stock of FDI in the United States decreased modestly in the post-CUSTA period, thereby continuing a pattern observable for the early 1980s. Similarly, Table 3 suggests that Canada's share of U.S. outward FDI decreased in the post-1986 period. [6] Table 4 shows a modest increase in the U.S. share of Canada's inward FDI stock post-1990 and a substantial decline in the U.S. share of Canada's outward FDI stock over the same period. Thus, patterns of relative bilateral FDI intensity indicate weak evidence of increased bilateral economic integration in the period following the implementation of CUSTA. Indeed, the patterns are more suggestive of decreased bilateral economic integration.

Besides phasing-out all tariffs between Canada and the United States, and enhancing the rights and securities surrounding bilateral foreign direct investment, the CUSTA facilitated the entry of temporary workers on a reciprocal basis between Canada

[6] Specifically, the fact that the share of flows in the 1996-2001 period for Canada was lower than the preceding share of stocks indicates that Canada's share of inward and outward stocks are declining over the 1996-2001 period.

and the United States through the establishment of a new visa category.[7] An examination of the percentage of total non-permanent immigrants to the United States from Canada shows essentially no change from 1986-1992; however, there was a significant increase (from around 11.6% to 18.7%) from 1992-2000.[8] The behaviour of business-related non-permanent immigration therefore suggests that intra-North American labour markets became somewhat more integrated on both an absolute and relative basis during the 1990s. Nevertheless, the number of skilled workers migrating to the United States from Canada is relatively small. For example, temporary immigration from Canada represented less than one-tenth of one percent of the total employed labour force in the United States in 2000.[9]

Convergence of Prices

As noted earlier, an important measure of increased economic integration is the convergence of costs borne by businesses and prices paid by consumers. With integrated markets, there should be a single price for any commodity if transportation costs, price-cost margins and taxes don't impede price equalization. In the presence of such impediments, prices should converge to relative equality. That is, prices should differ by no more than the relevant transaction costs. Hence, the degree of convergence of prices and costs is a measure of the success of trade liberalization and integration.

Recently, studies of commodity-level prices have become more common. For example, Engel and Rogers (1996) studied ratios of CPI indexes (including 14 categories of prices) for 23 different cities in Canada and the United States. They found when comparing cities in different countries that the deviations from the law of one price are larger than predicted based on distance alone. Engle and Rogers concluded that the combination of sticky nominal prices and exchange rate volatility explained some of this border effect.

The effect of trade liberalization on price convergence has been examined in studies by Engel and Rogers (1998) and Beliing Yan (2002). Engel and Rogers

[7] For a detailed discussion of the TN-visa category for temporary workers and an assessment of its impact , see Globerman (1999).
[8] For a fuller discussion and presentation of these data, see Globerman and Storer (2003).
[9] There has been a much faster growth of TN visas issued by the U.S. to Canadians than by Canada to U.S. citizens. See Egelton and Szadinski (1999).

examined city and province level consumer price index (CPI) series for 14 broad expenditure categories. Their method involved calculating relative prices for pairs chosen from fourteen cities (in the U.S.) and ten provinces (in Canada). The use of index numbers implies that the levels of these relative prices have no meaning. Hence, Engel and Rogers look at the two-month change in the relative prices. Their hypothesis is that changes in cross border relative prices for a given CPI category should be smaller the greater the degree of market integration.

To quantify border effects, Engel and Rogers first calculated the standard deviations for their city/province-pair price volatility series. The standard deviations were then used in a cross-section regression on a variable measuring the distance between each city/province pair and a dummy variable equal to one if locations are in different countries. To test for CUSTA effects, Engel and Rogers estimated regressions for 1978-88 and 1994-97 sub-samples. While the authors found some drop in the size of the coefficient for the border dummy variable, the distance coefficient also declined, and the authors attribute both of these declines to factors other than trade agreements.

The results in Engel and Rogers were partly driven by the changes in the variability of the Canada-U.S. relative prices that they calculated for 1978-88 and 1994-97. These results are reproduced in Table Five and show the greatest percentage declines in cross-border relative price volatility for the following categories: fuel and utilities, medical care, private transportation, shelter, and alcoholic beverages. Given the non-tradable nature of several of these categories, it is difficult to ascribe the declines in price volatility to trade liberalization. By contrast, cross border price variability actually increased for categories such as clothing and footwear where liberalization would be expected to have the largest impact on trade liberalization. While Engel and Rogers make no attempt to differentiate among goods based on tradability, their finding of greatest price convergence for less tradable goods reinforces their regression-based conclusion that price convergence was not accelerated by CUSTA.

Unlike Engel and Rogers, Yan (2002) uses actual prices rather than prices indexes and so can focus on price levels rather than changes in prices. Yan uses paired Canada-U.S. final user prices of 168 private business commodities for 1985, 1990, 1993 and 1996 to calculate deviations from the law of one price for each commodity. Yan looks at averages of logged values of deviations for three types of general groups: 1. non-tradable commodities such as services and trade-restricted goods such as milk; 2. differentiated tradable goods such as appliances and clothing, and 3. homogeneous tradable goods such as rice, fresh fruit and fish. Yan identifies a "V-shaped" pattern in the average deviations data. That is, average deviations for the three categories of products declined from 1985-1990 and then increased. This pattern mirrors the cycle of appreciation of the Canadian dollar from 1985-1990 followed by its depreciation, and the pattern is consistent with the sticky nominal price/volatile exchange rate explanation for deviations from the law of one price outlined by Engel and Rogers (1996). Given that both non-tradable and homogeneous tradable goods prices follow the same time-series pattern, it seems unlikely that trade liberalization is the common underlying cause of the similar patterns for all three categories of goods.

What these results for average deviations don't reveal is the degree of convergence of deviations from the law of one price for individual goods. The total variance from the law of one price, as calculated by Yan on an individual product basis, is shown in Figure 1 for each broad category of good. While trade liberalization could be expected to reduce this variance most for homogeneous traded goods, other things constant, departures from the law of one price generally increased for homogeneous traded goods after 1985. Indeed, in 1996, the overall variance was roughly double its 1985 value. In contrast, variances actually fell for both non-tradable commodities and differentiated tradable goods, with non-tradable commodities showing the largest decline in variance. This mirrors the results of Engel and Rogers shown in Table Five. Once again, it is difficult to believe that the convergence observed for non-traded commodities and differentiated tradable goods is due to the trade and investment liberalization provisions of CUSTA.[10]

[10] The patterns in Figure 1 seem to contradict Yan's results based on price differences averaged across products that we summarized above. The key to reconciling the observed differences is the recognition that

Convergence of Costs of Labour

To date, there has been relatively little analysis of the labour market effects of trade liberalization on relative wages in Canada and the United States. Gaston and Trefler (1997) found that the high interest rates associated with the anti-inflation policy of the early 1990s had a greater impact on the Canadian labour market than the trade liberalization due to CUSTA. Beaulieu (2000) presents evidence that the CUSTA tariff reductions has no effect on average annual earnings in the manufacturing industries for either skilled or less skilled workers. He attributes this finding to the fact that Canadian real wages didn't vary much after trade liberalization, so that there is not much variation to attribute to trade liberalization.

These existing studies of Canadian earnings do not permit analysis of relative labour costs in Canada and the United States. This is partly due to a lack of comparable occupational data, at least for long periods of time. Canada does not provide earnings data by occupation, and the industry data used in studies such a Gaston and Trefler and Beaulieu are not always comparable to industry definitions in the United States.[11]

One existing source of Canada-U.S. labour cost comparisons is the U.S. Bureau of Labor Statistics (BLS) indexes of hourly manufacturing compensation that are available for the U.S. and several foreign countries, including Canada. These series are available from 1991 through 2001, and the results are shown in Figure 2. This graph shows diverging trends in labour costs over the post-CUSTA period, with declining relative labour costs in Canada.[12]

Similar trends appear when average weekly earnings are compared for manufacturing, transportation equipment and lumber. For each industrial sector, the weekly wage increases in the United States relative to Canada, so that labour costs are uniformly lower in Canada by the end of the sample period (1991-2001).[13] While the

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the variance of individual product price differences can increase even as the average value of the differences across prices gets closer to zero. Simply put, positive and negative deviations from the late of one price can cancel out when averaged over a basket of goods.

[11] This latter problem will be reduced as data using the NAICS industry classification become available for both countries in 2003.

[12] The graph in Figure 2 uses the market exchange rate to convert Canadian dollars.

[13] Wage comparisons for these individual sectors are not shown in order to conserve space. The relevant data are available from the authors upon request.

levels of relative labour costs differ by industrial sector, the trends are almost identical for each sector and seem to reflect the large depreciation of the Canadian dollar combined with the relative "stickiness" of nominal wages.

Convergence of Costs of Capital

Integration of the Canadian and U.S. economies should lead to a convergence of costs of capital and rates of return on investment. At the margin, the cost of capital should equal the return on capital. Cross-border investment flows should tend to equate these returns and costs. Divergence between returns on capital in the two countries could reflect, among other things, barriers to non-resident investment in certain sectors (such as banking, broadcasting, or health care in Canada) or risk premia related to exchange rate risk or political risk.

One method of examining the convergence of rates of return in Canada and the United States is to examine firm-level data on profitability such as return on equity (ROE) or return on investment (ROI). The Compustat database has measures of these two returns using the following definitions:

ROE = Income Before Extraordinary Items/ Common Equity as Reported

ROI = Income Before Extraordinary Items/(Long term debt + Common equity + Preferred Stock + Minority interest)

Values for these two measures of the return on capital invested are presented in Figure 3. The U.S. series is the average of returns for the companies in the S&P 500 index while the Canadian series is for the TSE 300 index. Unfortunately, the Compustat data for Canada begins in 1988 (for ROI) and 1989 (for ROE), and this does not permit a long-term comparison. In the event, the bottom panel of Figure 3 examines the spread between returns in the United States and Canada and shows little evidence of convergence of rates of return on capital, with the possible exception of 2001 where the deeper economic downturn in the U.S. is apparent.

Another source of profitability data is the national accounts. Professor John Rodgers of Western Washington University has compiled comparable measures of the profit rates for Canada and the United States. Rodgers defines the net profit rates (NPR) as:

NPR = Output – Total Compensation – Depreciation/ Net Capital Stock

One advantage of using Rodgers' data to measure the return on capital is that it does not require the use of firm-level accounting data but rather relies on national accounts data. Recent concerns over standards at public accounting firms has led to increased reliance on profitability measures based on national accounts. Rodgers' data (shown in Figure 4 for the manufacturing sector) does show a definite trend toward convergence of net profit rates in Canada and the United States, but it appears that this trend mainly occurred before 1980. Moreover, the convergence is mainly due to a marked decline in the net profit rate in U.S. manufacturing from 1965 through 1980. While increasing integration between the two economies during this period (particularly that related to the Canada-U.S. Auto Pact) could have reduced differences in rates-of-return to capital, it doesn't seem plausible to us that this integration-driven equalization would have happened almost exclusively through adjustment of the net profit rate in the United States.

In summary, data for final output and factor input returns suggest that there has been little convergence of prices in the two countries in the post-CUSTA period, and the limited convergence that can be observed does not appear to be consistent with the implementation of a free trade agreement. Specifically, the convergence of prices observed in the post-CUSTA period appears to apply primarily to "non-tradable" goods. Given the existence of substantial departures from the law of one price in both output and input markets, one is led to conclude that CUSTA has contributed little to increased contestability of North American markets.

INTERPRETING THE EVIDENCE ON BILATERAL INTEGRATION

Our analysis to this point leads to the inference that economic integration between Canada and the United States in the post-CUSTA period has been relatively modest. One possible explanation of the relevant evidence is that the Canadian and U.S. economies were already so tightly integrated prior to the CUSTA that additional efforts by governments and business to link the two economies further were likely to have quite modest results.[14] However, this dismissal of the relevance of anticipated closer integration, at the margin, is unsatisfactory for at least two reasons. One reason is that

[14] This assertion is made by Helliwell (2001), among others.

relative price divergences in North American markets actually increased in specific cases in the post-CUSTA period, and this result is inconsistent with the "exhaustion of incremental integration opportunities" assertion. Rather, it points one in the direction of looking for factors that may have contributed to a greater balkanization of North American markets in the post-CUSTA period. A second reason is the marked increase in Canada's export intensity with the U.S. which is consistent with the previously cited (and surprising) finding of Helliwell that border barriers for exports from Canada to the U.S. showed a significant decline in the post-CUSTA period, but not so for U.S. exports to Canada.

A second possible explanation is that the implementation of NAFTA led to a "diversion" of U.S. trade and FDI with Canada to Mexico. This possibility can be quickly dismissed. For one thing, increased Mexican competition could not have contributed to the increased price divergences identified in an earlier section. For another, other than for the U.S. share of Mexico's exports, U.S.-Mexico bilateral trade and FDI actually decreased (in relative terms) in the post-NAFTA period (Globerman, 2002).

Hence, an explanation of the observed patterns of bilateral economic integration described above seemingly needs to confront two main characteristics: 1. the dramatic increase in Canada's absolute and relative exports to the United States and 2. decreases in other relative quantity flows such as FDI and increased price dispersion across North American output and input markets.

The Exchange Rate

An obvious candidate explanation for Canada's trade and FDI experience is the exchange rate. It is well known that with incomplete pass-through of exchange rate changes to domestic prices, real exchange rates will diverge from nominal exchange rates and relative prices (expressed in a common currency) will change within a trading region, other things constant.[15] Changes in relative prices, in turn, should influence trade patterns within the trading area.

Theory is less consistent when considering how exchange rate changes may affect FDI flows. Froot and Stein's (1991) model suggests that with imperfect capital markets,

[15] A comprehensive review of theory and available evidence on the pass-through of exchange rate changes and related phenomena is provided in Goldberg and Knetter (1997).

countries with appreciating currencies will find it cheaper to acquire foreign assets. Hence, they will increase their FDI in countries whose currencies are depreciating. The model rests upon the notion that companies must usually fund international expansion through their retained earnings. This notion is belied by data showing that multinational companies frequently finance the expansion of host country affiliates through local borrowing. It is also true that the remittances of profits earned in host countries with depreciating currencies will be worth less in home currency terms, and the overall impact of a depreciating foreign currency on the profitability of a foreign investment is, therefore, ambiguous.

Empirical evidence concerning the linkage between exchange rate changes and FDI flows is also inconclusive. In particular, there is no consistent empirical evidence supporting the inferences from Froot and Stein's model or identifying any consistent relationship between exchange rate changes and FDI flows.[16]

The available empirical evidence is more persuasive in showing that exchange rate volatility has substantial impacts on trade and FDI flows, as well as in linking exchange rate volatility to changes in relative purchasing power parity.[17] The most impressive empirical evidence on the linkage between stable currency values and trade flows is provided by Frankel and Rose (2002). They show that belonging to a currency union or currency board triples trade with other union or board members, and there is no evidence of trade diversion at the expense of non-members.[18] Globerman and Shapiro (2003) show that countries with exchange rates pegged to the U.S. dollar attract more U.S. FDI than do other countries.[19]

A pair of papers by Engel and Rogers (1996 and1998) measure the degree of economic integration by examining the law of one price. They find that the Canada-U.S. border was a more significant deterrent to price convergence than was physical distance. Engel and Rogers (1996) conclude that the combination of price stickiness within

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[16] For some evidence in a bilateral context and a review of other empirical studies, see Globerman and Shapiro (1999).

[17] Exchange rate volatility has been measured in different ways. We shall discuss measurements of the volatility of the Canadian dollar below.

[18] To be sure, there is no unanimity surrounding the linkage between trade flows and stable exchange rates. For an argument that the level of trade is not necessarily higher under a fixed exchange rate regime, see Bacchetta and Wincoop (1998).

[19] Other research reporting similar results are discussed in their study.

countries and volatile exchange rates explains most, but not all, of the lack of price convergence. Some portion of the border effect is also due to differences in national markets and distribution networks.

In short, the literature points to the importance of exchange rate behaviour as a determinant of economic integration, especially highlighting the relevance of exchange rate volatility. In the following section, we examine the behaviour of the Canadian exchange rate to assess whether it might help explain patterns of bilateral economic integration identified in earlier sections.

Behaviour of Canadian Dollar

Figure 5 shows that the Canadian dollar has experienced two periods of pronounced depreciation in the post-1973 period along with an appreciation over the period 1987 to approximately 1992.[20] Relative to an index of major currencies (including the Canadian dollar), the Canadian dollar appreciated relative to foreign currencies over the period 1973-1987 and depreciated against those currencies over the period 1992 – 2002.

While we do not provide a formal estimated model of the determinants of bilateral trade flows, the patterns reported in Tables 1 and 2 suggest that patterns of appreciation and depreciation of the Canadian dollar may not have played a significant role in determining bilateral trade flows. For example, the consistent increasing relative importance of the U.S. to Canadian exporters over the entire period 1980-2001 is inconsistent with the appreciation of the Canadian dollar relative to the currencies of other major exporters to the U.S. over the period 1973-1987. Also, the very modest changes in the U.S. share of Canadian imports is seemingly inconsistent with the marked changes in the value of the U.S. dollar relative to other foreign currencies when measured against the Canadian dollar.[21] Changes in Canada's share of U.S. exports and imports also fail to show any obvious linkage to the exchange rate patterns in Figure 5.

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[20] It should be noted explicitly that in Figure 5, higher log values of the currency index show that relatively more Canadian dollars are required to purchase a U.S. dollar with the ratio scale indexed to a 1989 base year value of 100.

[21] This observation is implicit in the convergence and divergence of the two functions exhibited in Figure 5. Convergence of the functions shows that buyers can purchase more equivalent amounts of U.S. dollars and other foreign currencies per Canadian dollar with the converse interpretation for periods when the functions are diverging.

Figure 6 illustrates the volatility of the Canada-U.S. bilateral exchange rate over the past thirty years.[22] It suggests an upward trend in volatility in the post-CUSTA period, which is confirmed by the increase in the average value of the 12-month moving standard deviation volatility measure of about 15 percent between 1980-88 and 1989-2003.[23] The increase in volatility is most pronounced after 1997.

The increase in the volatility of the Canada-U.S. exchange rate might account for the reduced importance of bilateral FDI in the post-1980 period that is illustrated in Tables 3 and 4. It might also explain the lack of increase in the shares of Canada-U.S. trade flows for all but Canadian exports to the U.S. This possibility becomes even more plausible when the volatility of the Canada-U.S. exchange rate is compared with that of the U.S. dollar relative to other currencies. Figure Seven shows the ratio of the volatility of the Canada-U.S. exchange rate to that of the trade-weighted U.S. exchange rate with major currencies. While the Canadian – U.S. dollar relationship is generally more stable than the trade weighted foreign currency index – U.S. dollar relationship, the former became significantly more volatile relative to the latter in the post-CUSTA period. Taking pre- and post-CUSTA averages, the average value of the relative exchange rate volatility index increases by (a statistically significant) 42 percent from 0.516 to 0.732.

Some measure of the impact of exchange rate volatility on economic integration can be obtained by comparing the variability of relative prices during periods of high versus low exchange rate variability. The analysis of Engel and Rogers 1998 (summarized in Table Five) showed a decline in the volatility of relative prices between Canada-U.S. city pairs after 1988. However, their analysis ended in 1997, while it is after this date that the variability of the Canada-U.S. exchange rate increases the most (see Figure Six). Hence, we extend the Engel and Rogers analysis of the city-level CPI for all items to include observations through early 2003.

The results of this analysis are shown in Table Six. Like Engel and Rogers, we find a drop in relative price volatility for cross-border city pairs between the 1978-88 and 1989-97 periods. Our figures are slightly different for two reasons. First, we use cities for Canada while Engel and Rogers used province-level data. Second, changes in the

[22] Following Deveraux and Lane (2003), we measure exchange rate volatility by calculating the standard deviation of the first difference of the natural log of the monthly exchange rate.
[23] The difference is statistically significant.

data released by the U.S. Bureau of Labor Statistics in 1998 required us to change the set of cities included in our analysis. Broadly speaking, though, we do replicate the Engel and Rogers results for 1978-1997. In addition, though, we find evidence of an increase in relative price volatility between cross-border city pairs after 1997. The increase of just under 21% between 1989-97 and 1998-2003 means that the post -1998 level of relative price volatility is greater than that during the pre-CUSTA period.

It is also interesting to compare the second and third columns of Table Six to look at trends in price volatility both between and within countries. The fourth column of the table shows the ratio of the between-country price variability to that found within the two countries. This ratio rose from 2.41 to 2.91 between 1978-88 and 1989-97 and increased to 3.06 in the 1998-2003 period. The increase from 2.41 to 2.91 is a crude indicator of the increased border effect that Engel and Rogers (1998) found in their more elaborate regressions including city-pair distance variables. The fact that this ratio increases even more after 1998 is further evidence that CUSTA did not lead to greater convergence of goods' prices.

CONCLUSION AND POLICY IMPLICATIONS

Our paper represents an attempt to assess the extent of economic integration between Canada and the U.S. in the post-CUSTA period using a range of different indicators. On balance, the evidence provides only modest evidence, at best, for relative bilateral integration in the post-CUSTA period. Indeed, evidence is available suggesting weakened integration, especially in the form of greater divergence of Canadian and U.S. input and output prices in recent years. Moreover, manifestations of increased integration do not seem to us to be plausibly explained by the NAFTA.

While no comprehensive attempt is made to identify the impact of exchange rate behaviour on the observed integration experience, the circumstantial evidence we present casts strong suspicion on the volatile Canada-U.S. exchange rate as a major factor discouraging continued economic integration in North America. In this context, it is possible that exchange rate volatility limited the positive impacts on integration that CUSTA might have had under a different exchange rate regime.

While abandoning the existing floating exchange rate regime for the Canadian dollar is a controversial suggestion, our evidence suggests that it may be critical to the success of any future initiatives to integrate North American output and input markets. In this context, calls for new integration initiatives may be largely irrelevant if they are not paired with proposals to adopt a new currency regime in Canada that achieves significantly greater exchange rate stability.

The growth in Canadian export intensity with the U.S. highlighted in this study is sometimes pointed to as an advantage of a fluctuating exchange rate. That is, the declining value of the Canadian dollar is seen as stimulating exports to the U.S., thereby mitigating problems posed by "inadequate" domestic demand. Earlier in the paper, we expressed some doubt about the importance of a declining Canadian dollar on Canadian exports. Canada's export experience during the 1990s reinforces this doubt. Specifically, the growth in exports to the United States from 1989-2000 was disproportionately influenced by the accelerated growth of exports in two industrial categories: industrial goods and materials and machinery and equipment. It is not obvious why a lower exchange rate, *per se,* should disproportionately promote exports of these two categories of products. A more likely explanation is the surge in U.S. capital spending over the period and especially in the late 1990s (Globerman and Storer, 2003).

Similar microeconomic factors may explain the increase in the U.S. share of Canada's exports during the early 1980s. While the U.S. share of Canadian merchandise exports increased from 63.9 percent in 1980 to 78.8 percent in 1985, a similar increase was observed in the share of automotive products (from 14.2% to 27.9%).

Our evidence does not enable us to conclude that the benefits of exchange rate flexibility in terms of enhancing adjustments to external influences are less than the costs associated with exchange rate volatility. However, we believe our evidence places an added burden on those who continue to defend the current exchange rate regime.

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Table 1
Canada's Share of U.S. Merchandise Exports and Imports
(Percent of Total)

	1980	1981-85	1986-90	1991-95	1996-2001
Exports	17	19	20	18	19
Imports	16	18	17	17	18

Source: US Department of Commerce, Bureau of Economic Analysis

Table 2
U.S. Share of Canada's Merchandise Exports and Imports
(Percent of Total)

	1980	1981-85	1986-90	1991-95	1996-2001
Exports	61	70	72	79	85
Imports	68	69	65	64	68

Source: International Monetary Fund, Direction of Trade Statistics, various issues

Table 3
Canada's Share of U.S. Inward and Outward FDI Stocks
(Percent of Total)

	1980 (Stock)	1986 (Stock)	1992 (Stock)	1996-2001 (Flow)
Inward	14	9	9	7
Outward	21	17	n.a.	10

Source: Rugman and Gestrin (1994), Graham and Krugman (1995) and the US Department of Commerce, Bureau of Economic Analysis.

Table 4
U.S. Share of Canada's Inward and Outward FDI Stocks
(Percent of Total)

	1986	1990	1995	2001
Inward	72	64	67	67
Outward	69	61	52	51

Source: Evans (2002) and Industry Canada (2001)

Table 5
Relative Price Volatility for Canada-U.S. City Pairs Before and After CUSTA (from Engel and Rogers 1998)

CPI Category	1978-89	1994-97	% Change
1. All items	1.82	1.65	-9.3%
2. Food at home	2.42	2.39	-1.2%
3. Food away from home	2	1.7	-15.0%
4. Alcoholic beverages	2.61	2.21	-15.3%
5. Shelter	2.68	1.72	-35.8%
6. Fuel and other utilities	5.06	5.05	-0.2%
7. Household furnishings and operations	2.23	2.37	6.3%
8. Men's and boys' apparel	4.48	5.06	12.9%
9. Women's and girls' apparel	7.86	8.58	9.2%
10. Footwear	4.76	5.82	22.3%
11. Private transportation	2.61	2.03	-22.2%
12. Public transportation	6.75	6.46	-4.3%
13. Medical care	2.6	1.81	-30.4%
14. Personal care	2.51	2.71	8.0%
15. Entertainment	2.31	2.46	6.5%
Pooled (2-15)	3.63	3.54	-2.5%

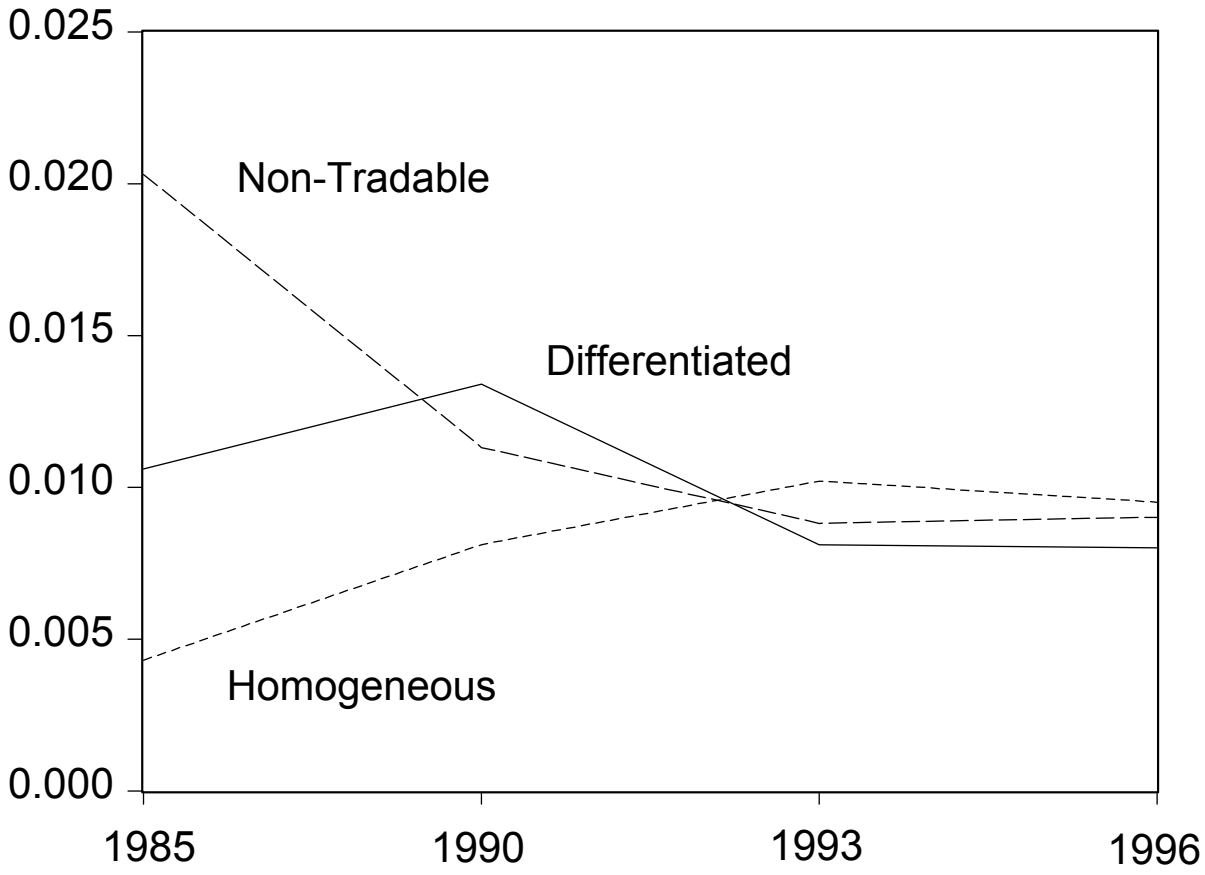
Source: Table 2. B from Engel and Rogers (1998). Relative price volatility if measured as the mean values for all city-province pairs of the standard deviation over the indicated period of the two-month difference in the natural log of the relative CPI ratio.

Table 6
Relative Price Volatility
CPI All Items Category

Period	Between Countries	Within Countries	Between/Within Ratio	Canada – Canada	U.S. – U.S.
1978-88	1.93	0.80	2.41	0.61	0.98
1989-97	1.72	0.59	2.91	0.53	0.66
1998-03	2.08	0.68	3.06	0.67	0.70

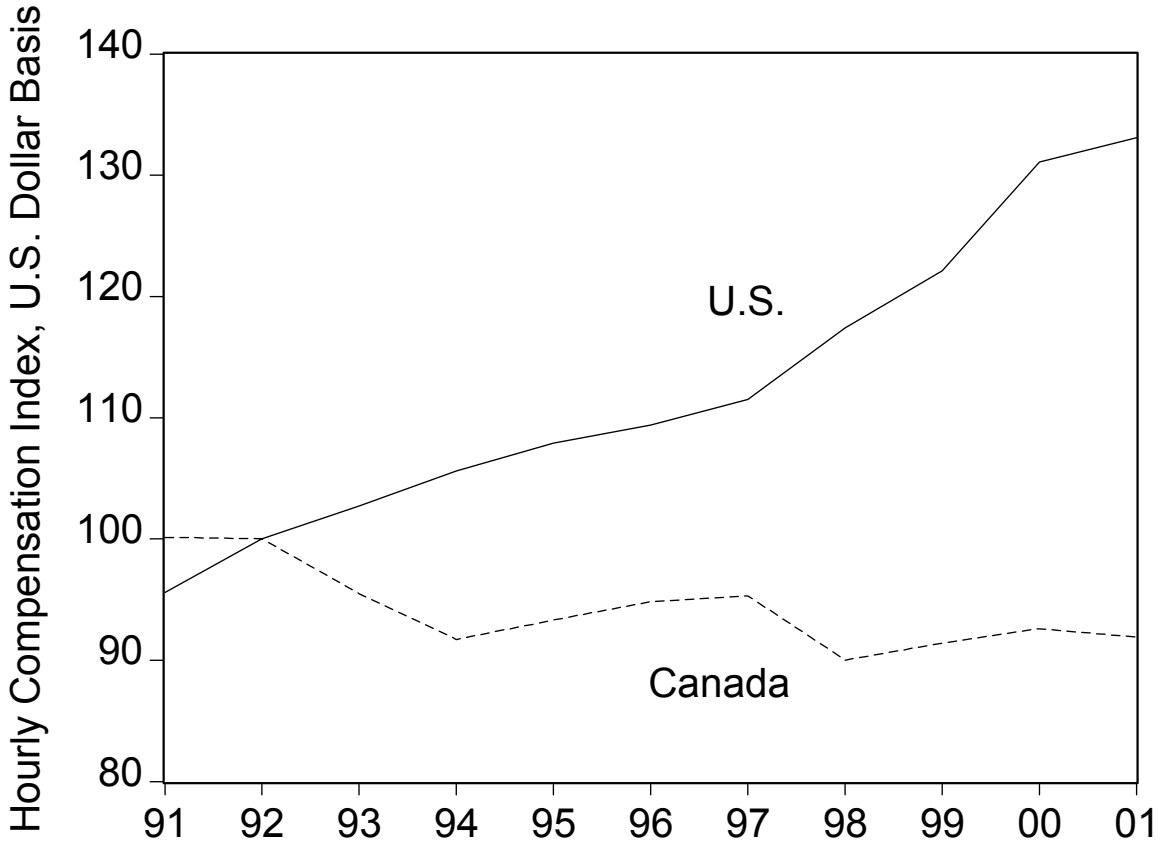
Source: CANSIM for Canada and the Bureau of Labor Statistics for the U.S. Relative price volatility if measured as the mean values for all city-province pairs of the standard deviation over the indicated period of the two-month difference in the natural log of the relative CPI ratio.

Figure 1: Variance of Canada-U.S. Deviations from PPP



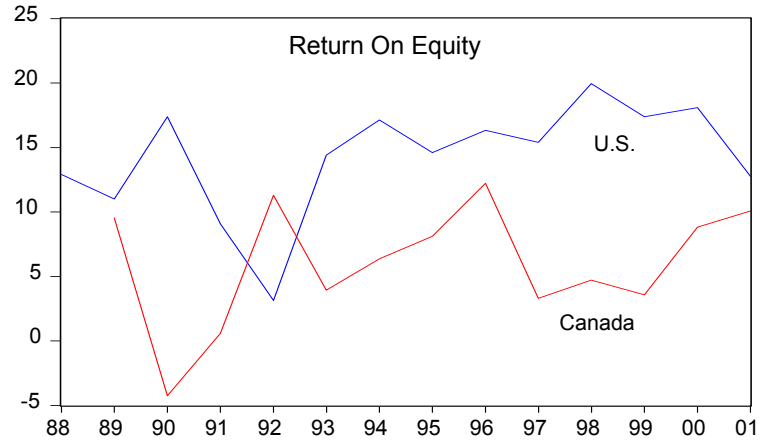
Source: Table 6 of Yan (2002)

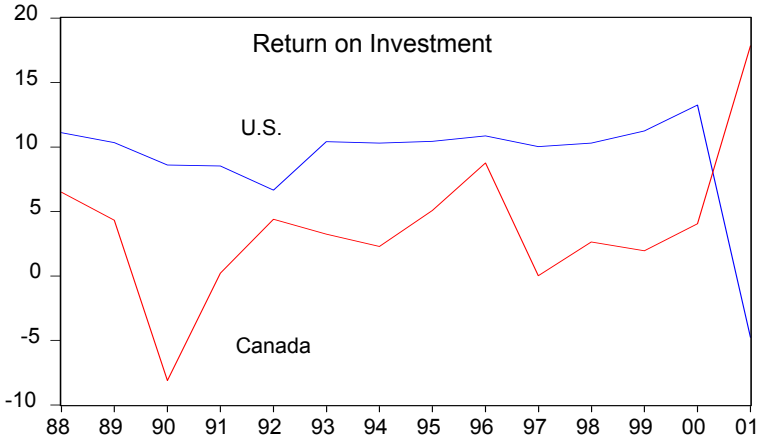
Figure 2: BLS Indexes of Hourly Manufacturing Compensation Costs (U.S. dollar basis)



Sources: BLS web site, series INU0007US0, and INU0007CA0.

Figure 3: Returns on Equity and Investment





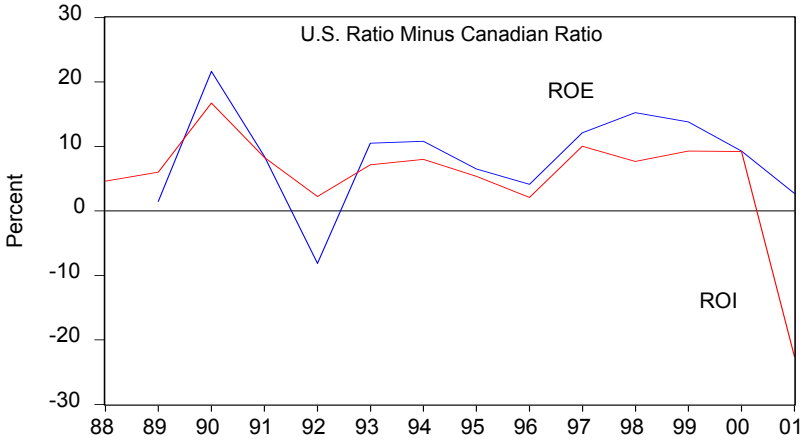


Figure 4: Manufacturing Net Profit Rates in Canada and the U.S.

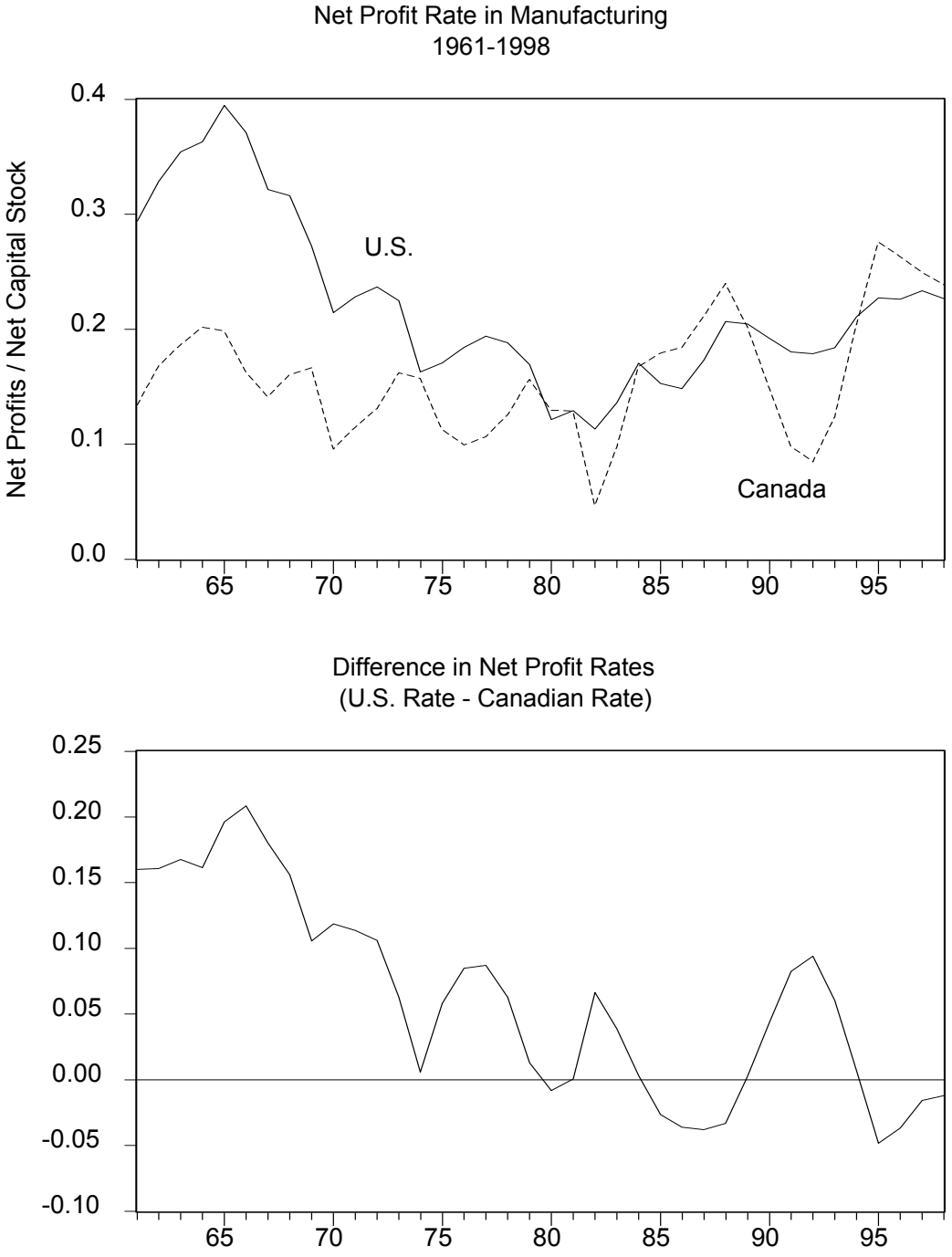


Figure Five: Behaviour of Exchange Rate Levels

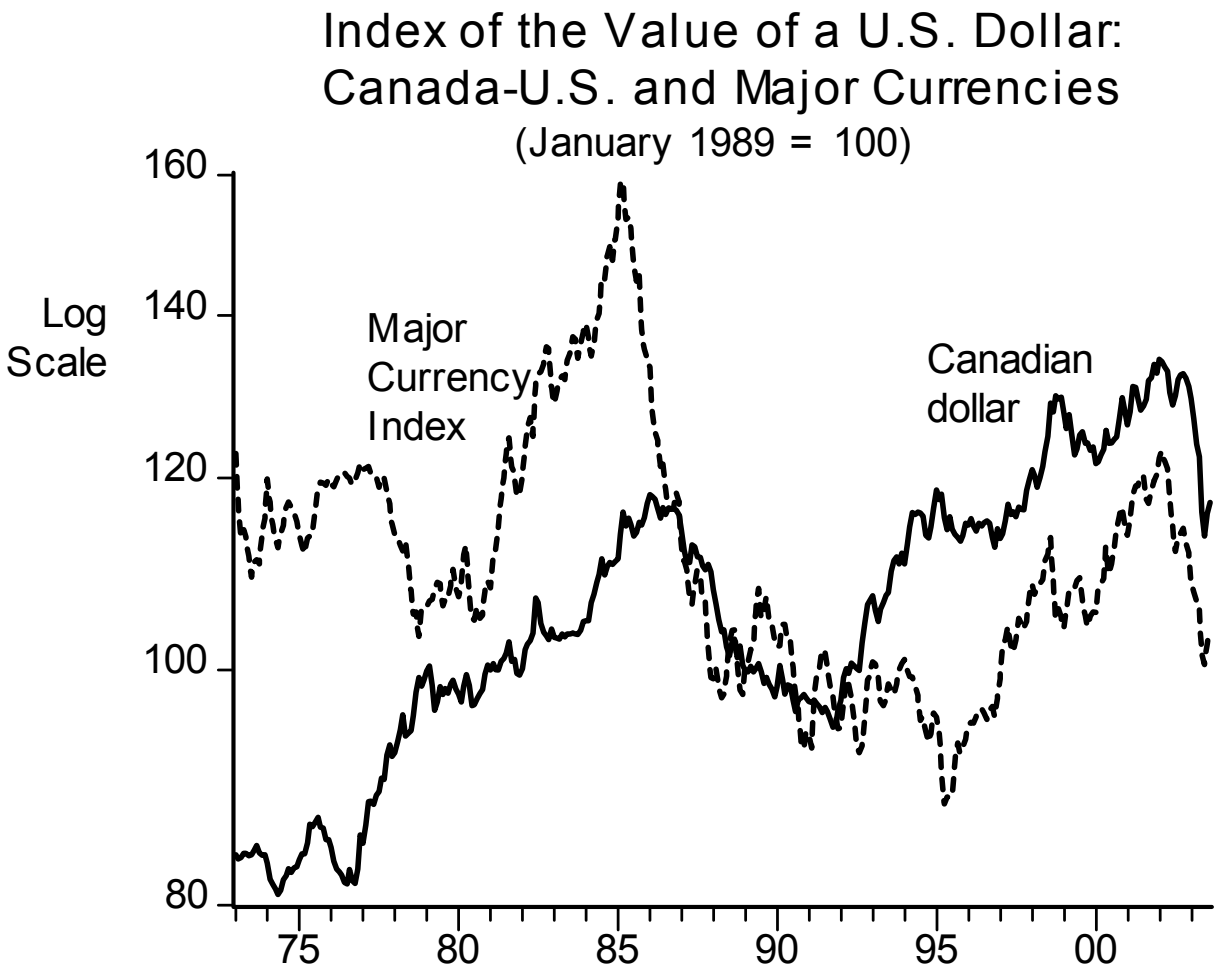


Figure Six: Volatility of the Canada-U.S. Exchange Rate

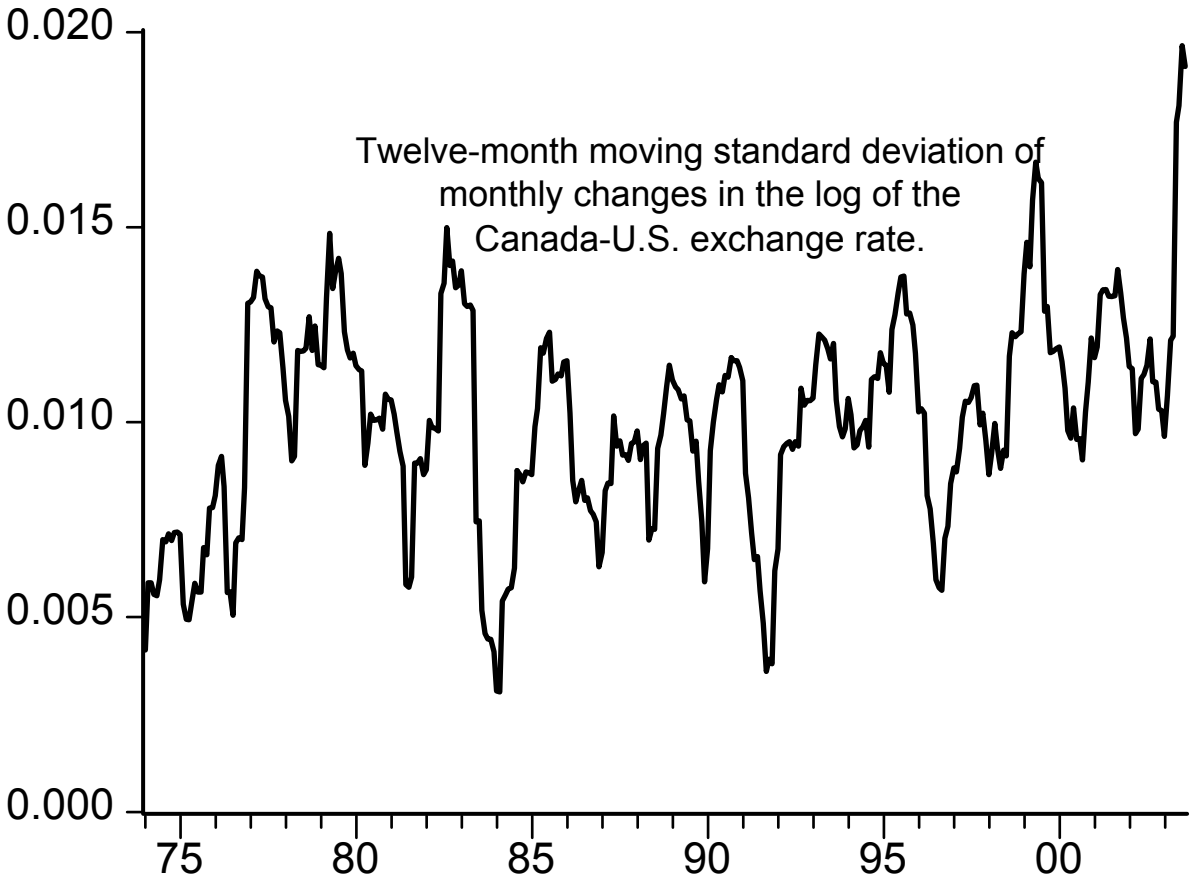


Figure Seven: Relative Exchange Rate Volatility