LOONIE ON PAR WITH THE GREENBACK?
MAYBE—BUT NOT TOMORROW!

A look at the determinants of the Canadian exchange rate:
a technical and econometric study

Summary

Over the last three years, the factors favouring Canada’s dollar have proliferated, pushing the loonie up by almost 40% against the American dollar. Given the difficulties of accurately predicting currency movements, few had predicted this. At this rate, can we expect to see Canada’s currency go above the US$0.90 mark in the near term? Anything is possible! But to make sure, we will examine the factors most likely to take the loonie higher, one by one.

In general, the Canadian exchange rate tends to adjust to the evolution of the economic fundamentals that influence trade. The acceleration in global demand for natural resources since 2002 has certainly had an upward impact on our currency, but our dollar seems to have been primarily influenced by factors that are usually viewed as marginal, counter-intuitive, even insignificant. Initially, it appears that the loonie’s relative strength is primarily reflecting the U.S. dollar’s underlying weakness during the period. Subsequently, in 2005, when the U.S. dollar was regaining some ground against most of the major currencies, the loonie didn’t just succeed in keeping its head up—it soared. For many, this, without question, is congruent with the sharp rise in energy prices, particularly oil.

Based on the Bank of Canada’s exchange rate models, we specify the determinants for Canada’s currency. In particular, we wonder about the evolution of raw materials prices and productivity gains, but also about short-term factors such as interest rate spreads and the outlook for the greenback. The conclusions drawn for some variables are sometimes astounding, even going against the grain. We believe Canada’s currency will stay on its rising trend for the quarters to come, but, as most of its appreciation has already been acquired, the outlook for future gains seems much more limited than it has been in the last three years.
Base model specifications

There are a variety of forms for exchange rate forecasting models: monetary, portfolio, general equilibrium, productivity differential and determined by the evolution of economic fundamentals. In most cases, however, these models’ explanatory power is no greater than a random walk, and few have any staying power.

The Bank of Canada’s (BoC) exchange rate equation, implemented in the early 90s, is an exception to this rule. Though very simple, the model captured the large fluctuations in Canada’s exchange rate over the entire initial estimation period (1983 to 1990), as well as over most of the following decade. The model’s specifications show that the Canadian dollar is, first and foremost, a money that is tied to raw materials prices (see Box 1, next page, for more details). The model’s breakthrough in terms of performance comes from dividing raw materials prices into energy commodities and non-energy commodities.

As expected, prices for non-energy commodities positively explain the evolution of the exchange rate. That is, a price increase tends to translate into a Canadian dollar appreciation. No surprise there, since Canada is a major exporter of natural resources. However, the results associated with energy prices may seem confusing. This is because the model shows a negative relation between the price of energy commodities and the exchange rate. In other words, an increase in oil prices tends to be reflected in a decline in the loonie. This may appear to be counterintuitive at first glance, but it must be understood that Canada’s net oil exports over the whole of the estimation period are relatively low and are unable to offset the negative impact of the increase in energy prices on the other Canadian industries.

Canadian exchange rate determinants

Already a leader, the BoC’s exchange rate forecasting model was enhanced a number of times so as to consider other variables likely to explain the currency’s evolution. In 2004, using a comparably designed model baptized NEMO (Nominal Exchange rate MModel), the BoC succeeded in improving the base model’s performance by including the productivity differential between the United States and Canada, the evolution of the trade-weighted U.S. dollar, and a measure of international risk. The adjusted model stood up well throughout the estimation period, except for the Asian crisis (1998) and the American recession (February to October 2001), and helped predict the Canadian dollar’s turnaround in 2003. The additions to the base model reassure us in our analysis. However, dropping the “energy prices” component leaves us confused about the latest developments, as does the interpretation associated with the productivity differential and the marginal role played by the trade-weighted U.S. dollar.

In the next few chapters, we will take a closer look at the variables most likely to influence the Canadian dollar in the years to come. In particular, we will look at the impact an economic slowdown could have on non-energy raw materials prices, on the empirical results associated with oil prices, on the perceptions of market stakeholders, on the chances of a further decline in the trade-weighted U.S. dollar and on short-term interest rate expectations in the Canada and the United States.

Non-energy raw materials prices: a cyclical question

The strength of the link between non-energy raw materials prices and the real Canadian exchange rate has been
clearly established by the literature. Of course, their role has declined extensively over time, with the weight of metals, ore and forest products as a percentage of total exports having been offset by the increase in oil products exports, but the prices of non-energy commodities still tend to dominate changes in the terms of trade.

While the tariffs imposed on lumber have helped undermine forest product exports in recent years, the U.S. economic recovery, drop in the U.S. dollar and China’s industrialization have helped metals prices—particularly for copper, aluminum and nickel—to soar. This has been very good for our currency. More recently, the slowdown in global industrial output has had a negative impact on the appreciation of prices for non-energy raw materials, but the CRB metals index, which recently hit its highest level in 10 years, has continued to climb, pushing Canada’s dollar to a more than 14-year peak at the start of the year.

The Bank’s exchange rate equation is based on an error-correction model developed by Robert Amano and Simon van Norden in 1991. The dependent variable is Canada’s real exchange rate, whose equilibrium value is determined by two independent variables: the price of non-energy commodities and energy prices. The short-term dynamic is captured by variations in the spread between Canadian and U.S. interest rates.

The equation can be expressed as follows:

$$\Delta \ln(rfx) = a(\ln(rfx)_{t-1} - \beta_0 - \beta_c \ln(comtot)_{t-1} - \beta_e \ln(enetot)_{t-1}) + \gamma \int \text{dif}_{t-1} + \varepsilon_t$$

where $rfx$ = the real (CAN$/US$) rate
$comtot$ = non-energy commodity prices
$enetot$ = energy commodity prices
$intdif$ = Canadian-US interest rate differential

The “metals” portion of raw materials is very cyclical

Forecasts: Judging by the OECD’s composite leading indicator (see next page), it is likely that economic growth will accelerate at the start of 2006, which would be compatible with increased demand for commodities. However, gold prices, which are heavily influenced by market speculation, could be subject to a moderate correction in the short term. The Fed’s monetary tightening, pullback by oil prices and low inflation are all factors that are unfavourable to an increase in gold prices.

Later in 2006, however, it could be possible for gold prices to begin climbing toward new peaks once more. Should U.S. monetary tightening cease, the excess liquidity in the world’s economy and strong demand for...
The OECD’s leading indicators point to better days for metals prices

Influence of oil prices: an empirical puzzle

Gone are the days when an increase in energy prices would lead to a weakening of the Canadian dollar. Some writers suggest that the negative relation between energy prices and the exchange rate is perhaps due to the fact that, at the beginning of the estimation period—between 1975 and 1982—Canada was a net oil importer. However, an update to the BoC’s model in the early part of this decade shows that breaking down the sampling period into three decades, that is, the 70s, 80s and 90s, does not yield the hoped-for results. Tested separately, the coefficient for the “energy prices” variable remains negative in the 70s and 80s and, when it becomes slightly positive as of the 90s, the variable no longer plays a significant role.

Dissatisfied, we tested a simplified model on the data for the last 10 years to try to gain a better understanding. After all, the correlation between the oil prices and the loonie’s exchange rate is currently strong, and most analysts would tell you that they provide Canada’s currency with solid support.

In 2005, oil price volatility was closely tied to the loonie’s fluctuations

It should also be noted that, contrary to the oil shocks of the 70s, the marked increase in oil prices since 2002 is primarily a reflection of growth in global demand. Under these circumstances, the effect of the increase in energy prices on Canada’s economy is much better absorbed and should be largely offset by the benefits gained from the growing oil industry.

The sharp increase in oil prices reflects accelerating global demand

We have been unable to establish a positive significant association between energy prices and the Canadian exchange rate. This is perhaps due to the stability of oil prices throughout the second half of the 90s. However, adding a dummy variable as of 2002 (when oil prices began to rise) seems to provide an explanation for the change in market stakeholders’ perception of oil prices.

jewellery from Asian countries could translate into further appreciation in the price of the yellow metal.
and their influence on the loonie. Of course, at close to US$60/barrel, it is becoming increasingly cost-effective to tap Alberta’s tar sands, and the magnitude of the reserves means Canada’s oil industry has a very promising future. Any price increase will therefore remain favourable to the loonie.

**Forecasts:** In the short run, we do not expect any major upheavals in oil prices such as those seen at summer’s end when Hurricanes Katrina and Rita struck in the northern Gulf of Mexico. The onset of winter and greater need for heating oil and natural gas could translate into higher prices, but the expected slowdown in global economic expansion will mean that oil prices will on average stay around US$58 until the end of 2006. That said, there is still palpable tension on the markets, and any disruption to supply will turn into a price increase. The Iran crisis is a good example of this.

In the years to come, we should not expect oil prices to return to where they were in the 90s. It must be said that China’s economy is not flagging, and the slowdown in oil imports in 2005, after record demand growth in 2004, promises to be temporary. Urbanization is continuing, and China is just getting started in terms of per capital oil consumption.

With the increase in revenues and access to credit for a growing number of households, motor vehicle sales could well explode in China in the next few years. Oil consumption could therefore double, triple or even perhaps quadruple. As oil producers already have little surplus capacity and given the difficulties of quickly increasing supply, the acceleration in Chinese demand can only lead to price increases in the long run. Under these circumstances, it is hard to picture Canada’s currency dropping back below US$0.80 in the next few years.

**Productivity:** hard to interpret, but statistically convincing

In spite of the increase in raw materials prices over the last few years, the updated BoC base model was unable to capture the currency’s turnaround in 2003. Adding the productivity differential between the United States and Canada to the model changed all that. Astoundingly, the empirical results show that a decline (increase) in the productivity of the manufacturing sector in relation to Canada’s total productivity in comparison to the United States tends to appreciate (depreciate) the Canadian exchange rate.

This seems fundamentally counterintuitive, since economic theory states that, if two countries have similar productivity growth in the service sector, the country with greater productivity growth in its manufacturing sector than its trading partner eventually sees a real appreciation in its currency. The reason is that wages and, by ricochet, prices will increase more quickly in the country with higher productivity gains.

One explanation could come from the one-good macroeconomic theory. In this type of model, international competition means that an increase in sales volume is sometimes achieved through a drop in prices. A country thus tends to depreciate its currency to move its output abroad. Under these circumstances, it is possible that the improved productivity seen in the United States in recent years triggered greenback depreciation. Conversely, since Canada, a small, open economy, doesn’t have the ability to influence international prices, weaker gains in Canada’s productivity produce a currency appreciation.
A recent study\(^{10}\) also shows that the main thing is not necessarily productivity growth but industry’s total contribution, which includes the contribution associated with changes in the relative size of the sectors. The Canadian dollar depreciation that occurred in the 90s could stem from the fact that the United States grew more quickly than Canada in terms of both productivity and the size of the service sector during this period. Almost the opposite effect has occurred since 2001, however. Of course, productivity gains remained higher in the United States than in Canada, but the weakness of Canada’s manufacturing sector means that the service sector has become larger, relatively speaking, so that it is now proportionally larger in Canada than in the United States.

In any case, and while the results are not what we were expecting, they are still quite robust. With some lag, adding the productivity component to the model offset the impact of the drop in raw materials prices at the start of the global recession, and kicked off the loonie’s sharp appreciation at the end of 2002.

Interest rate spreads: the key short-term variable

In the short run, market stakeholders are primarily focused on expectations associated with interest rates. Following the terrorist attacks in September 2001, U.S. monetary authorities took the bull by the horns to kick-start the economy, bringing the target rate for federal funds as low as 1%, the lowest rate since the end of the 50s. To keep from going into a recession like its neighbour, Canada also proceeded to lower interest rates, but never at the same pace, so that, until mid-2004, the spread between Canadian and American interest rates was largely tilted in our favour. This meant the Canadian dollar could literally take off during this period.

Since then, the U.S. economy’s recovery pushed the Fed to initiate its monetary tightening cycle. From June 2004 to November 2005, 13 consecutive 25-basis-point increases have taken the federal funds rate from 1% to 4.25%. This change, when most of the other major central banks were opting for the status quo, meant the greenback was able to take back in 2005 much of the ground lost in 2004 against the major currencies.

After taking a few months off, Canada’s return to monetary tightening stabilized the spread between Canadian and American short-term interest rates at close to 100 basis points. Stabilizing the interest rate spread, combined with the increase in oil prices, followed by gold prices, has allowed the loonie to perform much better than the euro, pound or yen against the U.S. dollar recently.

**Forecasts:** In the short run, the interest rate spread should narrow. On the one hand, the minutes of the last Fed meeting suggest that American monetary policy tightening is almost over. We believe the Fed will raise the target for federal funds only one more time, at the
January 31 meeting. Ben Bernanke’s arrival as Chair of the Fed and contained core inflation seem like a good time for halting U.S. monetary tightening. Particularly since the Fed does not want to unnecessarily trigger a flattening of the yield curve.

On the other hand, Canada’s economy is operating at close to capacity, and the BoC appears determined to reduce the degree of monetary stimulus. After the 25-basis-point increase decreed at the January 24, we believe the BoC will want to continue to tighten policy to a more neutral level at least once more at the start of 2006, allowing it to make up some of the gap with the Fed.

Trade-weighted U.S. dollar: short-term influence is marginalized in the long run

As the direct form of the Canadian exchange rate is expressed in U.S. dollars, the loonie’s evolution also depends on developments south of the border. For example, the U.S. dollar’s safe haven value means that periods of uncertainty usually favour it. From February 2002 to the end of 2004, we saw a marked depreciation by the greenback against a basket of major currencies. This downward movement stems from a number of factors but, fundamentally, most analysts will tell you that it is the size of the U.S. current account deficit that is setting off the alarm bells. In any case, the evidence of a link between the evolution of the U.S. dollar and Canada’s currency during this period is undeniable.

To size up its impact, we constructed an index of the U.S. dollar weighted by trade with the U.S.’ major trading partners, excluding Canada. As this graph shows, the correlation has been high since 2003, which suggests that the loonie’s relative strength (weakness) during this time is primarily a reflection of the U.S. dollar’s weakness (strength).

Yet the coefficient associated with adding the trade-weighted U.S. dollar to our estimation model indicates that its influence is marginal, empirically speaking. Over a long period, the connection between the two variables is not as present (see next page). It thus seems that international investors’ pessimism about the American dollar has certainly played in the loonie’s favour, but this alone is not enough to explain the extent of the loonie’s appreciation in recent years.

That said, the chances of future appreciation by the loonie partly depend on ongoing correction by the U.S. dollar. For now, stronger growth in the United States and, in particular, U.S. monetary tightening mean that the U.S. trade deficit has been put aside by international investors. The problem is still there, however. For some, as the American trade deficit is structural, in that most of the deficit represents a move by U.S. production towards areas with cheap labour, the magnitude of the deficit is not so disastrous. However, in spite of the U.S. dollar’s decline, the current account deficit as a percent of GDP
has continued to deteriorate, going from 4.2% in the first quarter of 2002 to a record 6.5% in the first quarter of 2005. Yet history shows that further depreciation will be needed to absorb or even just stabilize the deficit. Particularly since, in 2005, the U.S. dollar regained much of the ground lost in 2004 against the euro, the yen and the pound sterling.

**Forecasts:** In the short run, the U.S. dollar could continue to surge, but a number of factors suggest that most of the gains have already been made. In particular, the Fed has softened its stance on inflation concerns, and all the signs indicate that it is preparing to terminate its monetary tightening. Conversely, the European Central Bank has barely begun its rate hike cycle. The drop in net U.S. dollar purchases by market players clearly shows that the situation is about to turn around.

In the longer term, that is, toward the end of 2006 or start of 2007, we are expecting the American economy to slow down moderately. However, these moments of uncertainty will not necessarily translate into greenback appreciation.

It should be said that, in spite of some softness in the U.S., global economic expansion should remain vigorous in 2006 because of gains made in the euro zone, a more solid recovery in Japan, and sustained momentum by emerging economies.

The chances are that, as soon as the Fed announces an end to rate hikes, the U.S. dollar’s downward trend will start up again with renewed vigour to ease market fears regarding the blossoming U.S. current account deficit. However, barring a more substantial slowdown than expected, which could make the Fed relax its monetary policy again at the end of 2006 or start of 2007, the greenback correction should be moderate.

**Conclusion**

There are many determinants for the Canadian exchange rate. We believe the loonie will remain on its rising trend for the next several years, but there are fewer chances of large gains than there have been in the past.

In the short run, we do not expect the currency to deviate much from current levels. If oil prices remain high, or appreciate further, the loonie will continue to keep its head high. The cyclicality of metals prices means that we should not expect any sharp increases in 2006 as happened in 2004. However, small copper reserves and speculation on gold mean that prices for these metals should stay at high levels, which plays in the loonie’s favour.

Developments in the area of interest rates could also start the currency rising again. In particular, if strong domestic demand in Canada pushes the BoC to go it alone in North American monetary tightening, a narrowing spread between Canadian and U.S. short-term rates would drive the loonie to new cyclical peaks. It is also
probable that the U.S. dollar, after having shown renewed vitality in 2005, will sink back toward its end-of-2004 low. The American dollar’s decline, combined with the expected shrinking of interest rates and oil prices that are steady and high, would give the loonie some extra ammunition, which could once again confound forecasters’ predictions and enable it to pass the US$90 mark earlier than expected. That said, it would not be impossible for the loonie to reach parity with the greenback in the next few years, but it won’t happen tomorrow!

Notes

1 For a review of the literature and further details on the various types of forecasting models, see Bailliu and King, “What Drives Movements in Exchange Rates?” Bank of Canada Review, Autumn 2005, p. 29.

2 The non-stationarity of some financial series (the exchange rate, in this case) means that the best forecast for tomorrow is no more or less than today’s level.


6 Commodity Research Bureau.

7 Martin Charron and Joe Italiano, “A Review of the Link Between Productivity and the Exchange Rate of the Canadian Dollar,” Economic Analysis and Forecasting Division, Department of Finance Canada, May 2003.


9 The Balassa-Samuelson Hypothesis (BSH) is very restrictive, however, since it imposes a single factor in production (labour), 100% mobility for labour across a country’s sectors so as to equalize wages between the sectors and purchasing power parity (PPP).


13 A point we have already tackled to explain that revaluing the renminbi would not resolve the Sino American deficit, see “Revaluing the Renminbi Will not be Catastrophic for China,” Economic Viewpoint, August 2, 2005.

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