The Canadian Dollar's Fundamentals & the Trump Uncertainty Shock

We estimate a long-run relationship between the Canadian dollar and a set of variables governing the value of the loonie against the US dollar and find that the level of USDCAD can be explained by four core variables: oil and non-energy prices, the ratio of Canadian-US manufacturing labour productivity, and the 2-yr Canada-US bond yield spread. However, this relatively tight relationship has weakened since the election of President Trump in late-2016, which has pushed USDCAD to its current levels of around 1.32/33 while fundamentals would point to a value of around 1.25 CAD per USD.

The level of the Canadian-US dollar exchange rate can be closely explained by four long-run fundamental factors (see charts on page 3): oil and non-energy prices, the ratio of manufacturing labour productivity, and the 2-yr bond spread (more so since 2008). These four variables account for the lion’s share of the variability in the loonie in the 1995 to late-2016 period and combined track the level of the USDCAD exchange rate very closely.

However, the Canadian dollar has seemingly diverged from its long-run fundamentals since the election of President Trump in Nov 2016 owing to the degree of uncertainty that Trump’s trade agenda has generated on the future of the global economy and the free flow of goods. Canada and Mexico were among the first victims of the White House’s protectionism, as the two countries were pushed into agreeing to a renewed trade agreement with the US, lest NAFTA were ripped up or further tariffs were imposed on their exports to the US. Since late-2016, the loonie has remained fundamentally undervalued as bouts of trade uncertainty, as captured by market volatility indices, stiffen the headwinds for the currency.

THE MODEL: LONG- AND SHORT-RUN FUNDAMENTALS

We estimate an error-correction model (ECM) from 1995 to present which consists of two components: one which represents a long-run cointegrating relationship between the dollar and a set of fundamental drivers and another component which captures the short-term dynamics in the exchange rate. The latter equation may be interpreted as the ‘error-correcting’ part of the model, as it incorporates an adjustment factor for the currency which pushes it toward its long-run fundamentals, i.e. those that make up the first equation.

I. LONG-RUN EQUATION

The estimated long-run equation is similar to the Bank of Canada’s Nominal Exchange Rate Model (NEMO) as it incorporates the ratio of Canadian to US manufacturing labour productivity and the BoC’s non-energy commodity prices index. We augment this equation with oil prices and the 2-yr bond yields spread. We also incorporate the CBOE’s volatility index (VIX) to capture the effect on the Canadian dollar of the most recent rise in market uncertainty. The inclusion of VIX is in line with recent work done by our Scotiabank Economics colleagues (see here) who found that the rise in uncertainty since Trump’s election has resulted in an 11% premium in the real effective US exchange rate above its fundamental level. The fundamentals included in the equation (with the results of the estimation shown in table 1 on page 3) have the following effect on USDCAD:

1) CAD-positive long-run determinants:

- **Oil and non-energy prices (inflation-adjusted):** a higher level in the inflation-adjusted value of these leads to a higher value for the Canadian dollar (charts 3 and 4). We pre-multiply oil prices by the share of crude oil imports in total crude oil consumption in the US in order to correct for the relative importance of crude imports into US consumption, particularly as US crude production has soared post 2012. While Canadian crude exports to the US have risen incessantly through our estimation period, their overall share of US crude consumption has fallen.
the near
dispute with China, the threat of tariffs on European autos, and the cumulative impact of these on global uncertainty set to prevail in
valuation of the US dollar over the loonie. With an impeachment investigation underway in the US House, the still unresolved trade
evolution of the short-
-2) CAD
a. Ratio of Canadian to US manufacturing labour productivity: higher Canadian labour productivity relative to US labour productivity in translates into a higher level for the Canadian dollar (chart 6). This result is somewhat counter-intuitive as the more ‘mainstream’ theory suggests that relatively higher productivity in the tradable sector leads to a relatively larger increase in wages for both tradable and non-tradeable employees. Higher relative wage gains result in a higher relative increase in prices across the
two countries which in turn translates into a real appreciation in the currency as the purchasing power of people in the partner
country falls behind. This hypothesis is commonly known as the Balassa-Samuelson effect. However, in the case of Canada—a small-open economy—an increase in the relative supply of manufactures per employee means that the Canadian dollar must depreciate in order for this additional supply to attract an additional swath of US consumers. The Canadian manufacturing sector quite obviously operates with the US market in mind as domestic demand is not large enough to absorb the whole of Canadian manufactures, nor on the margin.
b. CBOE volatility index since November 2016: an increase in US market volatility, interpreted as an increase in market uncertainty, leads to a depreciation of the Canadian dollar since President Trump’s election. Heightened market risks owing to trade uncertainty lead to an increase in demand for safe haven assets such as the US dollar or US Treasurys, and away from the Canadian dollar—in addition to the impact on the currency from actual or possible tariffs on Canadian exports to the US. The inclusion of a VIX variable by itself over the whole of the estimation period is not statistically significant, which would suggest that the VIX is not a long-run determinant of the fundamental value of the Canadian dollar. We also attempted to incorporate other measures of trade or market uncertainty, but these were not as effective at explaining the undervaluation of CAD during the Trump period or did not prove statistically significant.

II. SHORT-RUN EQUATION

The short-run equation—which estimates the month-to-month change in USDCAD—incorporates the same variables as the long-run equation, although we include VIX over the whole estimation period in the short-run estimation. While market volatility levels don’t appear to play into the fundamental value of USDCAD, the month-to-month change in volatility does appear to impact the short-term value of the loonie, before and after Trump’s election. The short-run equation also includes the previous period change in CADUSD and the previous period’s deviation in the dollar from its fundamental drivers. Table 2 shows the results of the estimation, from which we draw the following conclusions:

1) CAD-positive short-run determinants:
   a. Change in in oil and non-energy prices (inflation adjusted): an increase in prices leads to an appreciation of CAD.
   b. Change in the 2-yr bond spread (inflation adjusted): also since 2008; widening spread leads to an appreciation of CAD.

2) CAD-negative short-run determinants:
   a. Change in the VIX: an increase in market volatility leads to a depreciation of CAD.

3) Ex-post and fundamental short-run determinants:
   a. Previous period change in the USDCAD: the exchange rate tends to build on the previous month’s change.
   b. Previous period difference between the actual and fundamental level of USDCAD: the disequilibrium in the actual exchange rate from the fundamental exchange rate closes at a rate of around 10% per month, all else equal.

UNCERTAINTY TRUMPS FUNDAMENTALS

According to our modelled equation, USDCAD should currently sit at around 1.24/25 based on its long-run determinants and the evolution of the short-term drivers of the currency since November 2016. Instead, the USD is, on net, unchanged at around 1.32/33 Canadian cents since Trump was elected president. For comparison, spot WTI prices averaged $45.6/bbl in the three months prior to his election, the 2-yr US-CA spread averaged 0.23 ppts, and the BoC’s non-energy commodity price index averaged a level of 302. In September, these variables sat at $57/bbl, 0.10 ppts, and 335. On the other hand, the CA/US manufacturing productivity ratio has trended upward in support of the USD although this rise is not large enough to explain the strength of the USD against the CAD. Ultimately, the divergence of the USDCAD from its fundamental drivers appears to be explained by the rise in market and trade uncertainty brought on by President Trump’s erratic political agenda, with the President’s actions leading to an estimated 5% overvaluation of the US dollar over the loonie. With an impeachment investigation underway in the US House, the still unresolved trade dispute with China, the threat of tariffs on European autos, and the cumulative impact of these on global uncertainty set to prevail in the near-to-medium term, the Canadian dollar looks poised to remain undervalued in the foreseeable future.
CADUSD Long-run Equation

<table>
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<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>t-stat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturing productivity ratio (lag 6)</td>
<td>0.346</td>
<td>6.85</td>
</tr>
<tr>
<td>Real WTI oil price (log) * trend in imports share of US crude cons.</td>
<td>-0.170</td>
<td>-4.89</td>
</tr>
<tr>
<td>Real non-energy commodity prices index (log)</td>
<td>-0.524</td>
<td>-11.98</td>
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<tr>
<td>CA-US real 2-yr bonds spread * Jan-08 dummy</td>
<td>-3.461</td>
<td>-2.42</td>
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<tr>
<td>VIX (log) * Nov-16 dummy</td>
<td>0.020</td>
<td>3.65</td>
</tr>
<tr>
<td>Constant</td>
<td>0.388</td>
<td>8.01</td>
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</tbody>
</table>

Adj. $R^2 = 0.969$

CADUSD Short-run Equation

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>t-stat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Real CADUSD, log-difference (lag 1)</td>
<td>0.239</td>
<td>5.3</td>
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<tr>
<td>Exchange rate disequilibrium (lag 1)</td>
<td>-0.100</td>
<td>-3.8</td>
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<tr>
<td>Real WTI oil price (log) * trend in imports share of US crude cons., difference</td>
<td>-0.001</td>
<td>-6.2</td>
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<tr>
<td>Real non-energy commodity prices index, log difference</td>
<td>-0.160</td>
<td>-4.7</td>
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<tr>
<td>CA-US real 2-yr bonds spread * Jan-08 dummy, difference</td>
<td>-5.445</td>
<td>-6.6</td>
</tr>
<tr>
<td>VIX, log difference</td>
<td>0.031</td>
<td>5.8</td>
</tr>
</tbody>
</table>

Adj. $R^2 = 0.482$
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