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Economic Research

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Commodity currencies: Canadian Dollar

The Dukascopy Bank research department is launching a series of research devoted to various traders' perceptions and general myths that are popular among investors. We start the series with research on commodity currencies (currencies of countries rich in natural resources, with the Canadian, the Australian, and the New Zealand dollars being the most liquid of them), as they are believed to be highly linked to the movements in physical commodity prices.

In this study we will investigate properties of currency pairs containing Canadian dollar, and demonstrate:

1. Whether there is a stable relationship between the Canadian dollar currencies and commodities
2. How strong the link is and what currency pairs are the most impacted
3. Whether the Canadian currency exchange rates and commodity prices are currently linked strong enough to use it in trading

A priori, Canadian Dollar should have a strong bonding with the commodity asset class as Canada exports large quantities of diverse natural resources; their proportions are shown in Figure 1.

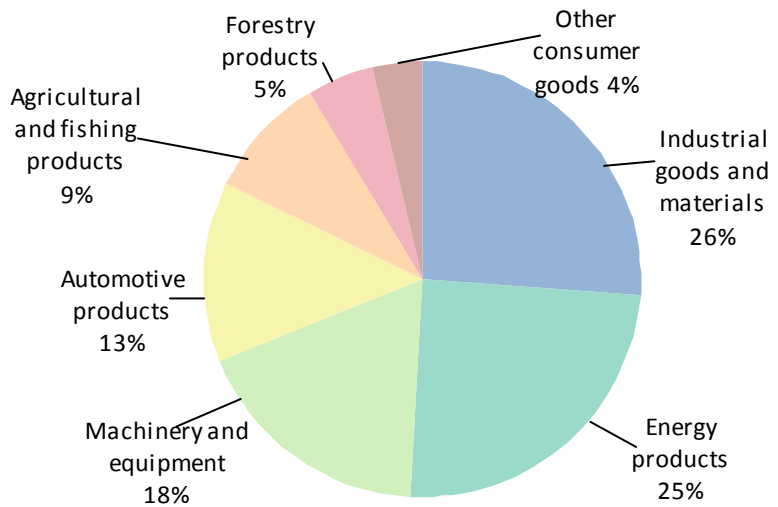
Methodology

The most popular method for studying the relationship between two assets is to analyse their rolling correlation.

Correlation is a measure of how similar the performances of two datasets are. It is expressed by a correlation coefficient that can vary from -1 to 1, with -1 being a perfectly opposite movement and 1 – a perfectly unidirectional. Commonly absolute values of 0.3 and below are considered insignificant.

Asset returns are a suitable characteristic for correlation analysis as they have all the statistical properties the method requires. Thus a currency can be described by returns of the pairs it is involved in (relative changes in consecutive exchange rates), and commodities – by relative changes in their prices. For the purpose of research we used the most liquid CAD pairs: CAD/USD, CAD/EUR, CAD/JPY, CAD/AUD, CAD/NZD, and CAD/CHF.

Figure 1 Canada's 2011 export by product



To represent developments in commodity sectors we used the following spot sub-indices of S&P: GICS (Global Industry Classification Standard), S&P GSEN (energy), S&P GSIN (industrial metals), S&P GSAG (agriculture), and S&P GSPM (precious metals). We applied the method to three data sets: daily, weekly, and monthly returns, within a time frame from 2000 to 2011. The results obtained using weekly data were the most reliable in terms of stability and value (daily data results were too volatile, but monthly, being as stable as the weekly ones, displayed a decline in value), and thus we will be focusing on them.

Findings

First finding: the relationship between the Canadian dollar currency pairs and commodities was not stable and varied significantly during the last 12 years.

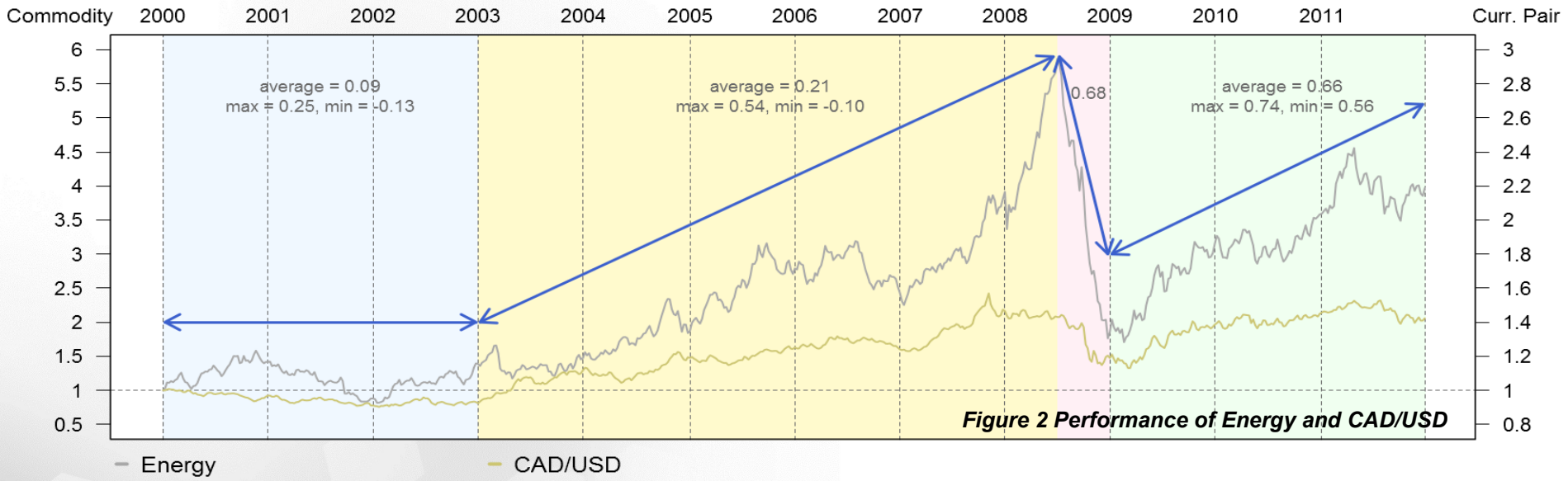


Figure 2 Performance of Energy and CAD/USD

The price for commodities demonstrated extremely high volatility during the same period, and these two observations (instability of the relationship between the returns of exchange rates and commodities, and volatility of commodity asset class) were related. In this respect the time interval from 2000 to 2011 can be broken into several massive periods:

1. ~ 2000 – 2002 - a calm period with no directional change
2. ~ 2003 – mid-2008 - a period of smooth growth
3. Late 2008 - a sharp downfall
4. 2009 – 2011 - a rapid recovery period

This granularity is well traceable in figure 2, which outlines the price dynamics of the Energy sector of commodities and the CAD/USD exchange rate. Moreover, periods for Energy match global tendencies on the market due to 2000s commodities boom. This makes the sector suitable for illustrating performance of commodities. In the figure we also provide average, maximum, and minimum correlations for each period.

2000 – 2002: Both the Energy sector and CAD/USD experienced relatively non extreme price changes throughout the period. The currency exchange rate showed a smooth downward movement up to the first half of 2001 and remained at approximately the same level thereafter. The commodity price had a zigzagging pattern of change. Its maximal growth of 58% over base value by the end of 2000 contrasted with the currency pair's 6% decline. However, the period's low for both assets occurred simultaneously in January 2002, reaching -19% for commodity and -9% for currency pair. This unstable linkage resulted in the correlation varying from negative to positive with an insignificant average value of 0.09.

2003 – mid-2008: Asset movements were uncoordinated up until mid-2004, with short periods of opposite directivity. During this time the correlation remained weakly negative. June 2004 marked the beginning of a common uptrend. The first noticeable peak in commodity took place later that year, when the price rose by 22% in one month. The strengthening of CAD against USD followed right after (+5%). In 2006 the correlation reached its local maximum of 0.54. In November 2007 CAD was at maximum strength against USD (at CAD/USD 1.0812), with a 57% rise over base value. Starting from that point, the exchange rate got into the period of a mild downtrend. The commodity price, on the contrary, burst higher on and reached a maxi-

Late 2008: The commodity price slumped right after reaching its maximum and bottomed out in the end of the year. This was accompanied by a sharp devaluation of CAD against USD. By the end of 2008 the commodity price lost 70% of its mid-year value, whereas the currency rate dropped 16%. The correlation for the period was at 0.68 – a very high level of significance.

2009-2011: By March 2009 both assets were on an uptrend lasting until April 2011. During this time the correlation reaches higher than 0.7 and never dropped lower than 0.6 afterward. In April 2011 the commodity price reached its period's maximum recovering 70% of 2008's loss. CAD was back on the strengthening track reaching a local maximum of 1.0529. After a mutual contraction that followed, both assets faced the end of the period with an undirected movement, the currency rate at the pre-crisis level and the commodity price above one of late 2007. The correlation had values of 0.67-0.68 since November 2011, and thus remained above the period's average and firmly in the high significance area.

<u>Second finding</u>: the correlation between separate currency pairs and commodity groups differs substantially

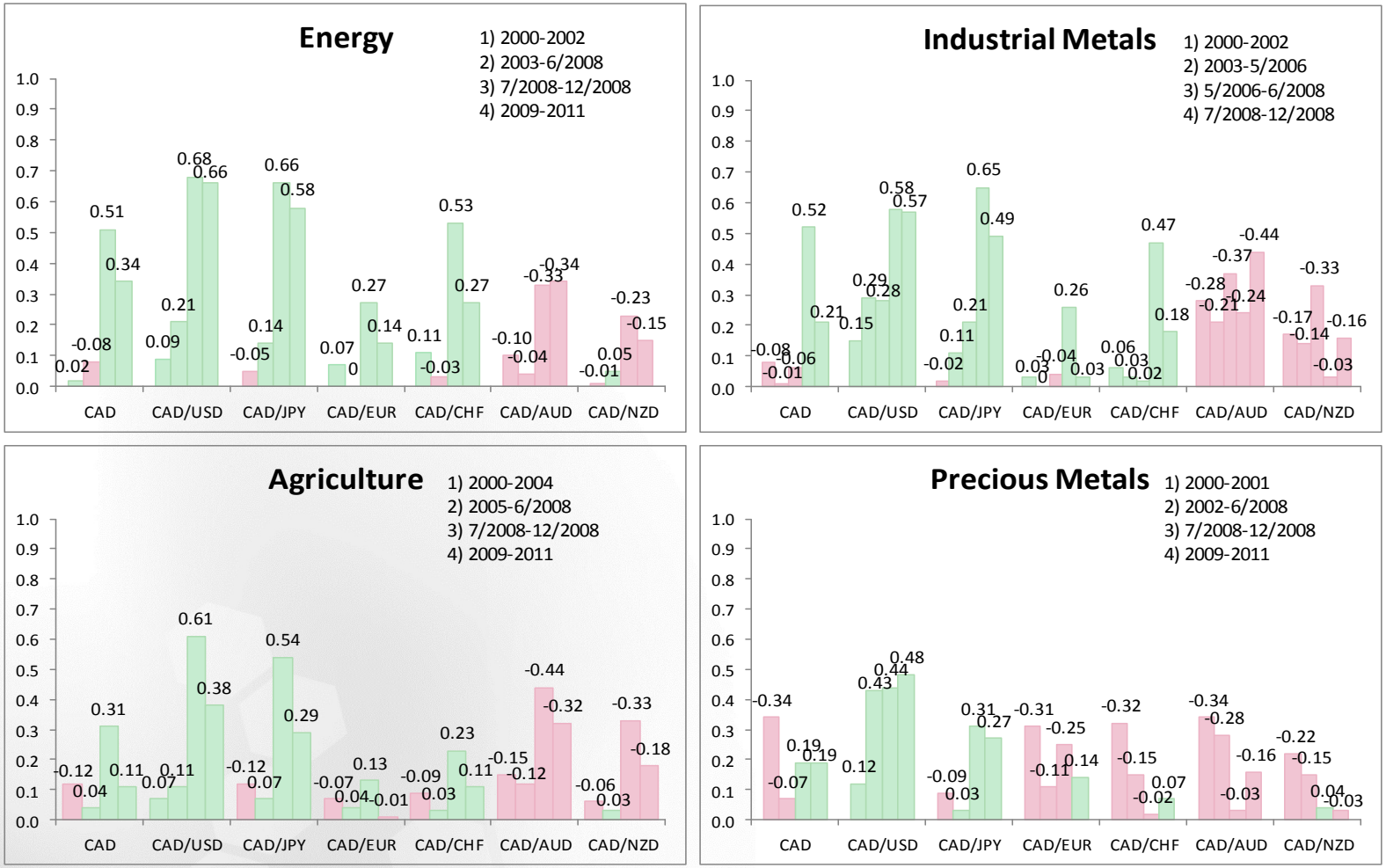


Figure 3 Correlation coefficients for 2000-2011

Figure 3 displays the average correlation between different CAD exchange rates and commodity groups in specified periods. The CAD value represents the results for average returns and describes the link between the currency and commodities. This overall relationship is generally rather weak. The Figure makes it easy to see that the currency pairs can be divided into three coefficient value-based groups. The first group consists of CAD/USD and CAD/JPY as the pairs with the highest coefficients. The results for CAD/AUD and CAD/NZD are relatively high in their absolute value, but are negative, and so were placed into a separate group. This means that the relationship between these four pairs and commodities exists and possibly can be used in trading. The third group that includes European currencies has much lower and mostly insignificant correlations, so commodities do not affect their movements and cannot be used as trading signals.

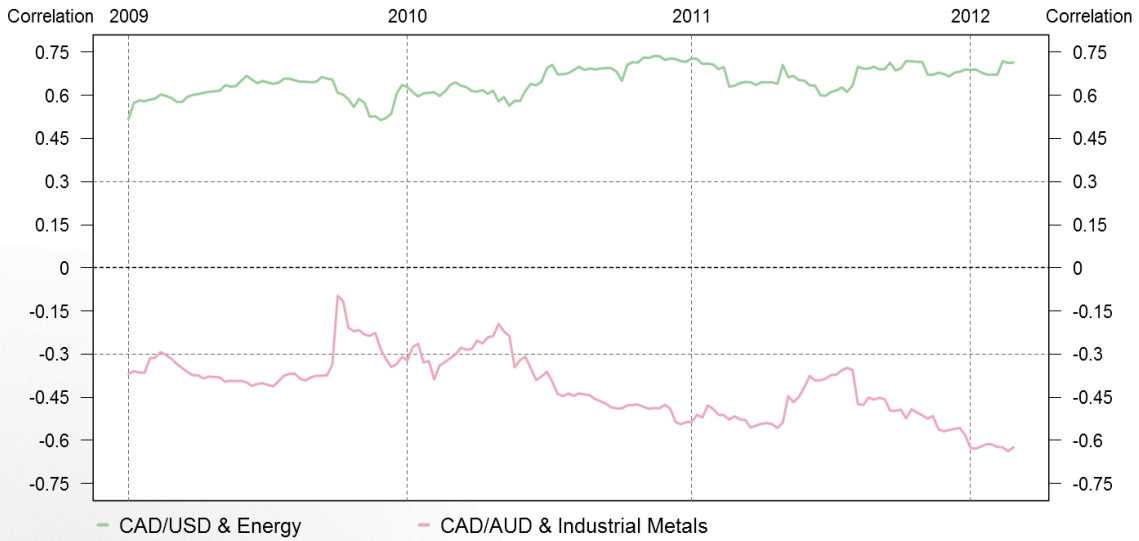


Figure 4 Rolling correlation for 2009-2012

<u>Third finding:</u> currently the link between several CAD currency pairs and commodity groups is at historic highs and is very significant. These combinations may serve as a considerable trading tool.

Figure 4 provides the proof that the link between both positively and negatively correlated assets is getting stronger. By March 2012 the CAD/AUD-Industrial Metals negative correlation has reached its best value of -0.64. The same strengthening occurs in all combinations with the pairs of the second group. CAD/NZD-Industrial Metals catches up with CAD/AUD on -0.64, making Industrial Metals the leading commodity for the group. Values for other commodities for both pairs are around -0.5. This means that currently commodities prices and these currency rates move in opposite directions. The rise in the CAD/USD-Energy correlation is not that substantial, and the values remain rather stable throughout the period. They stay around 0.7 at the beginning of 2012 – the level of highest values for 2000-2011. The correlation between the pair and Industrial Metals rises more sharply and reaches its maximum of 0.79. This indicates that the currency pair's and the commodities' movements are well coordinated and share one directivity. Values for CAD/JPY increase as well, but do not yet reach the highest observed levels. The CAD/JPY-Energy and CAD/JPY-Industrial Metals correlation are on 0.56, but CAD/JPY-Precious Metals shows the only insignificant value. Correlations between commodities and pairs with European currencies remain insignificant and do not show any signs of strengthening.

Conclusion

Rank	Currency Pair	Commodity Sector	Correlation	Performance
1	CAD/USD	Industrial Metals	0.79	commodity ↗, pair ↗, CAD strengthening commodity ↘, pair ↘, CAD weakening
2	CAD/USD	Energy	0.71	commodity ↗, pair ↗, CAD strengthening commodity ↘, pair ↘, CAD weakening
3	CAD/AUD	Industrial Metals	-0.62	commodity ↗, pair ↘, CAD weakening commodity ↘, pair ↗, CAD strengthening
4	CAD/JPY	Energy	0.56	commodity ↗, pair ↗, CAD strengthening commodity ↘, pair ↘, CAD weakening

Figure 5 Top pair-commodity correlations by March 2012

Presently there are several currency-commodity combinations that should be interesting for traders. Energy might be considered in trading CAD/JPY, Industrial Metals – in CAD/AUD. Changes in both commodity sectors are significant for CAD/USD. However, the relationship is changeable, and traders should follow global market tendencies to estimate the link.

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