

FX Crossroads

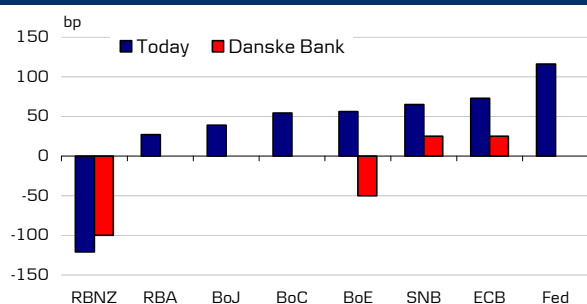
25 June 2008

Special edition: Focus on inflation and FX

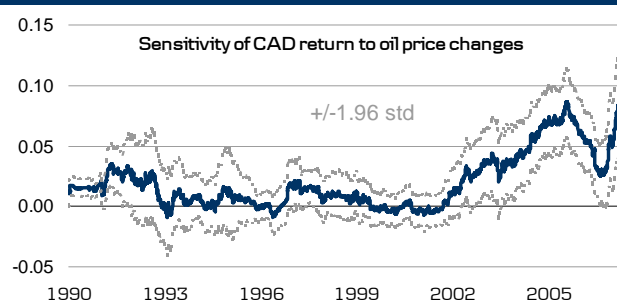
Summary and conclusions

- In this edition we focus on the impact of rising inflation on currency markets – whether through consumer or energy prices.
- In the first article we argue that rising inflation could be bringing to an end 10 years of stable disequilibrium in global financial markets, causing an upset to the recycling of capital from Asian FX reserves and Middle Eastern current account surpluses, just as financial leverage could decline further.
- In the second article we consider the most recent re-pricing of the outlook for the G10 central banks. We identify where central banks are in their cycles, and also the driving factors going forward. We generally expect money market rates to end the year well below what is currently implied. From a relative perspective, we see most value in selling USD and GBP against continental Europe and AUD.
- In the final article we explore the link between oil prices and currency movements. We identify four G10 currency pairs that have moved less than the recent increase in oil prices would suggest. All other things being equal, the rise in oil prices has increased the upside risk on EUR/USD and EUR/JPY, and the downside risk on USD/CAD and EUR/NOK (USD/NOK).
- *FX Crossroads* is published every other Wednesday. Next publication date is 9 July 2008.

Expected changes in policy rates over the next 12 months



CAD currently appears to be the most oil-price-sensitive currency in the G10 complex



G10: Inflation upsets stable disequilibrium

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No return to *status quo ante*

What are the implications of rising inflation for currency markets? The short answer is that rising inflation is not good news, even for a relative market such as FX, and much of what many have come to take for granted during the past 10 years may be coming to an end.

Since last summer, our investment strategy has been based on the dual shock of financial crisis and economic slowdown. Conventional wisdom predicts only a temporary setback to the financial sector followed by a short-lived mid-cycle slowdown. We are not so sure. There is still nothing to indicate that the financial crisis is over, witness the continued underperformance of banks and brokers. Cyclical threats to overextended consumers on both sides of the Atlantic also appear to be enough to temper economic optimism. If the two waves of bank and consumer balance sheet repair collide, the result could become ugly.

On top of this, we now have to deal with rapidly rising inflation. Higher inflation caused by rising energy and food prices equals a decline in disposable income. Monetary tightening, either as threatened by both the Fed and the ECB, as the result of delayed rate cuts in the UK and Canada or outright rate hikes (as in Denmark, Hungary, Poland, Turkey, South Africa and a large number of Asian countries recently) also dampens economic activity, reducing our hopes for a recovery in 2009. Within G10 cyclical downturns have in the past seen statistically significant outperformance of the euro, Swiss franc and yen vs. the Australian dollar, Canadian dollar and sterling.

Low inflation rates in recent years have made western central banks more willing to experiment with economic growth rates. This experiment now seems to have given way to a more traditional focus on inflation, which, in turn, indicates a shift relative to the 'awash-with-cash' cycle from 2002 to 2007. Part of this experiment helped deliver an unprecedented rise in financial leverage, exceptional performance of FX carry trades and extraordinary weakness of the yen and Swiss franc. As the

liquidity cycle turns, so will leverage and although the short-term policy cycle is currently taking EUR/JPY and EUR/CHF higher, the medium-term outlook is not equally benign.

Rising price pressures in Emerging Markets contribute to higher global inflation through rising export prices. But perhaps more importantly from an FX perspective, now that EM countries have begun to fight inflation through traditional monetary channels, the result is likely to be weaker fundamentals and hence higher risk premiums. Not least, this is true of non-Japan Asia, where secular re-pricing may be under way, upsetting commonly held expectations about currency appreciation. Few currencies in the region seem able to follow CNY higher and none, including the Chinese currency, have been able to match the euro this year.

Rising inflation may also cause a shift in global FX policies. Since the Asian crisis in 1997-98, the US dollar has benefited from a role as monetary anchor. In what is commonly known as Bretton Woods 2, the USD has been the centre of a weak form of currency union that includes a number of Asian, Middle East and Latin American currencies. This has lent monetary credibility to the periphery, while giving the USA easy access to financing its current account deficit. For the global economy the effect has tended toward lower inflation and lower interest rates and thus higher growth. Currently, the set-up is being hit by two asymmetrical shocks; one in the form of falling US growth, and one in the form of rapidly rising inflation at the periphery. Diverging policy needs imply that pegging to the dollar may no longer be the obvious policy choice. For the US, this is not a trivial threat and we see recent statements about the dollar from both the Federal Reserve and the US Treasury in this light - not as an attempt to change the rules of the game, but as an attempt to maintain them. For the periphery, replacing dollar pegs or managed floats, particularly this late in the inflation-cycle, will not be easy and cannot be arranged without high costs and alternative currency anchors may be considered instead. Whatever the choice, 10 years best characterised by stable disequilibrium seems to be coming to an end.

G10: Central bank cycles and drivers vs. FX

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How to exploit current central bank pricing in FX terms

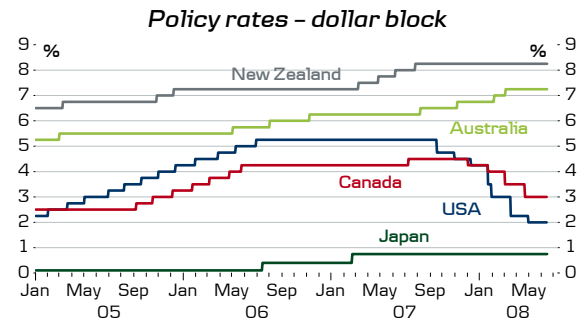
Since March, financial markets' have seen a dramatic repricing of the outlook for central banks. Higher food and energy prices have caused policy rate expectations to rise across the board and expectations that monetary policy will be eased due to deteriorating growth prospects have been abandoned. In this article, we identify where central banks are in their cycle, look at the impact on the business cycle from shifts in real interest rates, interpret the message from business indicators to monetary policy and consider the driving factors for central banks going forward. Finally, we use these insights to detect likely FX movements.

Recent swings in implied money market rates seem to imply that central banks have lost control of near-term inflation. Price pressures are certainly evident in almost all G10 economies. But most central banks have a medium-term focus and are obliged to deliver price stability only within that time-frame. We believe central bank reaction functions remain unchanged - i.e. the medium-term will remain in focus. Since we are fairly downbeat on expectations concerning effects from the financial crisis and future global economic growth in general, we believe policy rates will be lower than implied by current market expectations.

The FX implication of this conclusion is to sell USD/JPY and sell GBP against better performing currencies, such as AUD or EUR.

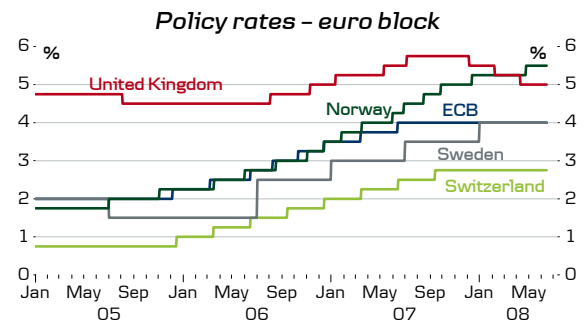
Where are central banks in the cycle?

Despite the global surge in inflation rates and widespread inflation fears - and perhaps against conventional market sentiment - **central banks are not in the midst of a universal rate tightening cycle. Most have been in a wait-and-see-position and kept rates on hold.** In the G10, only one central bank has changed the policy rate at its latest meeting on monetary policy, namely the Fed - and that brought a rate cut due to considerable distress in financial markets, tighter credit conditions and the deepening housing contraction.



Source: Ecowin

Concerning latest G10 central bank moves, three central banks lowered rates when monetary policy was changed last time, while seven raised rates. However, while three central banks lowered rates (Fed, RBC, BoE) in 2008, four out of seven of the remaining group (ECB, BoJ, SNB, RBNZ) hiked rates in 2007 and have been on hold ever since. Two central banks (NB, RBA) raised rates mainly due to domestic factors, national wage pressures and rising national economic growth. Only one central bank (RB) hiked saying that food and energy prices were the driving factors.



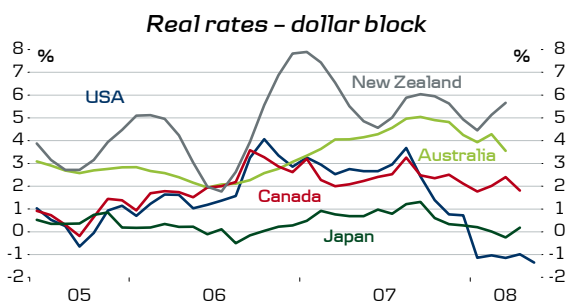
Source: Ecowin

The current pricing of money markets imply that **nine out of ten central banks in the G10 is expected to raise rates as their next move.** Only one central bank (RBNZ) is expected to lower rates. With seven hiking the last time rates were changed, we can view this technically as a resumption of the tightening cycle - although for some subject to a substantial time lag (e.g. BoJ and ECB). It may, however, be a bit too easy just to assume that we are about to see a continuation of tightening cycles that began in 2006. The hikes carried out last

year relied on prevailing upside risks to price stability over the medium term, with international monetary policy regarded as accommodative from an economic perspective. In 2008 we have experienced a rally in food and energy prices of a magnitude only seen few times in history. So despite expected changes in policy rates are in same direction as previous for most central (excluding Fed and BoE), these represent a new situation where inflation is the paramount concern of central banks.

De facto tightening and easing

Even if rates remain on hold for some time, economic agents can still experience a de facto tightening or easing. **If the inflation rate rises faster than the nominal interest rate, the real rate declines and agents are accordingly exposed to a monetary easing.** The opposite is true if inflation declines more rapidly than the nominal interest rate.



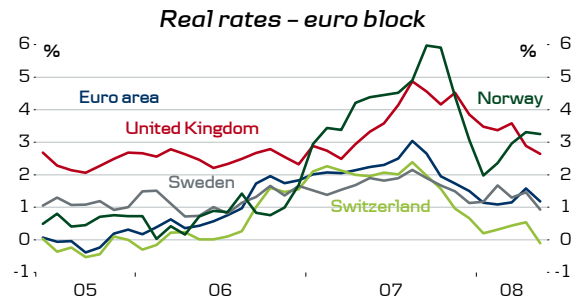
Note: Annual CPI inflation subtracted from 3M deposit rates. Approximation to real rates. Source: Ecwin

As global inflation has recently been rising faster than nominal rates in general, most real rates have fallen. Consequently, a de facto easing of monetary conditions has occurred. However, there are variations; since inflation has impacted differently in various countries and nominal interest rates have not behaved in similar ways, de facto easing has varied in effect in each country.

De facto easing has been most pronounced in the US. American real rates have fallen into negative territory this year and are therefore below their Japanese counterparts. Also de facto monetary conditions in Australia and Canada have recently been eased.

The downward sloping trend in European real rates has been evident since the autumn of 2007. In

other words, monetary conditions have de facto been eased across Europe. UK and Norwegian agents are currently experiencing the tightest conditions; the euro area is at a lower level, in line with Sweden, while Swiss real rates are now close to zero.



Source: Ecwin

To summarise, when considering the impact of monetary policy it is crucial to identify the effect felt on households. **US, Japan and Switzerland already have loose monetary policy conditions, already stimulating growth.** This group of countries has most potential for higher rates. **New Zealand, Australia, UK and Norway all have tighter monetary conditions. For these countries, imminent higher rates are less necessary.**

Business indicators and policy rates

Monetary policy relates to a country's business cycle. Conditions in the business sector impact on the real economy and can therefore boost prices (if industry is booming) or dampen prices (if industry is slowing). The PMI manufacturing index has been to be a good predictor of changes in the policy rate. Specifically, **the PMI leads the six-month change in the policy rate by around four months.** Appendix 1 shows this relationship for G10 countries.

In general, **all G10 PMI manufacturing indices have shown a declining trend recently suggesting that rates should be lowered everywhere.** In fact, four countries' PMI's are now signalling a contraction in manufacturing sectors (i.e. in US, Euro Area, Japan and New Zealand). However, PMI declines and subsequent (if any) policy action (if any) differ across countries.

The US PMI index has declined from 52.8 to 49.6 in the past year - i.e. suggesting a modest easing of

monetary policy. The Fed funds rate has been lowered by no less than 325bp - i.e. a substantial easing. This implies that the Fed has been 'ahead of the curve' and that the US policy rate has been lowered further than business indicators have suggested.

Also UK rate cuts have been somewhat preemptive in the sense that they have occurred just ahead of declines in business indicators. The UK PMI index has dropped considerably; from 55 a year ago to currently 50. The UK base rate has been reduced 75bp. Here however, it is important to note the level of interest rates. While business indicators are broadly neutral, the base rate level may still correctly be considered as restrictive. Accordingly, rates still need to be lowered in order to reflect current business conditions.

While the strong relationship between the euro area PMI index and changes in the ECB minimum bid rate seems to be intact, the corresponding relationship appears recently to have been broken in the case of Australia, Sweden and Norway. In those countries, the PMI index has dropped 4, 7.7 and 8.7 index points respectively. This should indicate substantial easing, but policy rates have actually been raised in all countries. Again, levels may be important, suggesting that rates are appropriate in Sweden, while perhaps too high in Australia. PMI manufacturing in Norway still points towards expansion, meaning that rates can stay high for some time.

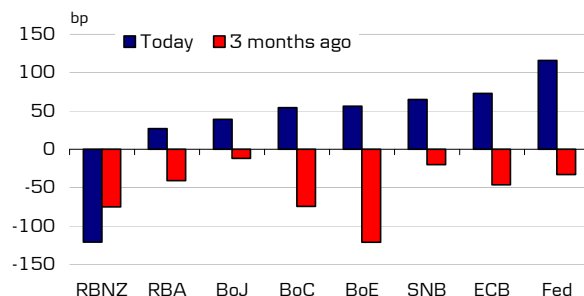
What is driving central banks?

At the end of 2007, growth scares started to materialise on the back of the credit crisis. The global economic outlook was worsening and financial markets expected that central banks would be required to take appropriate action by lowering rates. The Fed had already slashed rates and the UK was on the brink of following in its footsteps. Expectations for G10 GDP growth in 2008-09 were down-scaled across the board, except for Norway which continued to boom led by the soar-away oil sector. Most recently, market expectations to GDP growth rates for 2008-09 have fallen below potential levels.

GDP,%	Median forecast		Change from last mth.		Danske Bank	
	2008	2009	2008	2009	2008	2009
USA	1.3	1.4	0.0	-0.2	1.2	1.5
Euroland	1.7	1.5	+0.1	-0.2	1.4	1.5
Japan	1.4	1.7	-0.1	-0.1	1.4	1.7
UK	1.7	1.6	-0.1	-0.1	1.6	1.6
Denmark	1.5	1.3	-0.1	-0.2	1.4	1.3
Sweden	2.1	1.9	-0.1	-0.3	1.8	1.6
Norway	3.3	2.3	+0.2	-0.1	3.5	2.9

Central banks have acknowledged the downside risks to their domestic economies and the global economy in general. The Fed noted in its most recent statement on monetary policy: "... [US] economic activity remains weak. Household and business spending has been subdued and labour markets have softened further". The ECB stated in its latest Monthly bulletin that "the uncertainty surrounding this outlook for [euro zone] economic growth remains high, and downside risks prevail", noting furthermore that "growth may be weaker in 2009 than in 2008". The BoE identified "a more prolonged slowdown in [UK] demand growth" and the BoJ pointed out that "Japan's economy was likely to grow at a slower pace for the time being..." and "considerable downside risks (...) in overseas economies and financial markets" remained.

Expected changes in policy rates over the next 12 months



Note: Expectations derived from overnight interest rate swaps. There is no OIS market in Scandinavia. Source: Bloomberg

All G10 central banks were expected to react to the deteriorating growth outlook by cutting interest rates. Only the Fed and UK have responded by doing so. All other banks have either remained on hold or raised policy rates. **What has happened?**

According to one interpretation, financial markets have completely misjudged central bank reaction functions. That is partly true; most central banks maintained an almost stubbornly hawkish stance when growth prospects darkened. Market participants attached little or no credibility to these

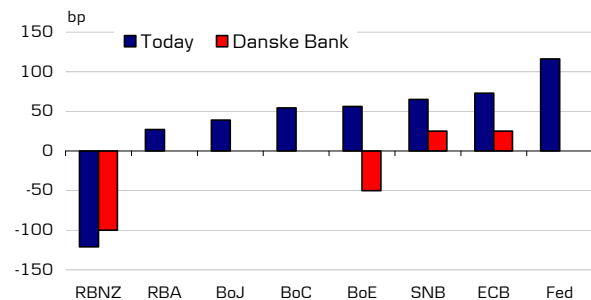
statements despite being fairly concerned by upside risks to inflation.

Another explanation is that new information has impacted the market. The simultaneous rise in food and energy prices has proved to be more persistent and prolonged than first anticipated. That has caused immediate inflationary pressure, exerting significant upward pressure on headline inflation data. Central bank worries have proved right; most inflation rates have risen above comfortable levels and are even set to climb higher. This has in many ways been the trigger for action with market participants now attaching more credibility to inflation warnings from central banks. In everyday communications, so-called central bank ‘hawks’ have taken over from ‘doves’ with speeches, comments, etc. largely focusing on the need to raise rates in order not to lose control of price stability.

After substantial easing, investors now expect a normalisation of US monetary policy to begin in September this year. In fact, the curve now discounts over a 100bp in rate hikes over the next 12 months. The ECB was expected to deliver 2-3 rate cuts of 25bp only three months ago. Now they are thought likely to raise rates by the same amount. BoC and especially BoE were expected to slash rates substantially. Today, financial markets are expecting rate hikes of at least 50bp from them by mid-2009. Scandinavian banks are also expected to hike rates. Only RBNZ is still expected to lower them.

Is such a massive re-pricing justified? The short answer is a resounding NO! We think current market pricing is way out of line with realities and for four key reasons: **1) The financial crisis still presents downside risks to all economic outlooks** (banks and brokers continue to underperform); **2) We are still in the midst of a global slowdown with no immediate recovery in sight** (German ZEW, US Philly Fed and Japan’s Tankan have all dropped); and **3) No policy measures have so far been able to avoid the crisis from spreading** (e.g. the US fiscal stimulus package, coordinated measures from central banks, G8 comments). **4) The current rise in inflation rates is unlikely to continue.**

Expected changes in policy rates over the next 12 months



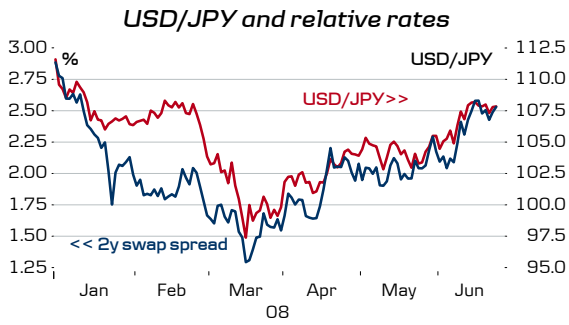
Note: No column implies expectation of no change in period
Source: Bloomberg, Danske Bank

As the chart implies, we expect central banks to react less to the current surge in food and energy prices than the market in general. No central banks can avoid short-term inflation rates from spiking upward. We expect that some central banks will send a ‘warning-shot’ over rising prices (EBC, SNB and RB) and to try to anchor inflation expectations but we do not expect that to be the rule generally. We believe the Fed will let its monetary policy do the work (note: rate cuts have historically worked subject to a 6-9 month time-lag). Our view is that the BoE base rate is already sufficiently restrictive and that the bank’s easing cycle can accordingly continue when price pressures moderate.

To sum up, we believe central banks are continuing to focus on the medium term when inflation is expected to fall back. Rising energy prices will curb inflation in the medium term as they push production lower and dampen demand. Combined with lower growth prospects, global interest rates are not set for a substantial rise.

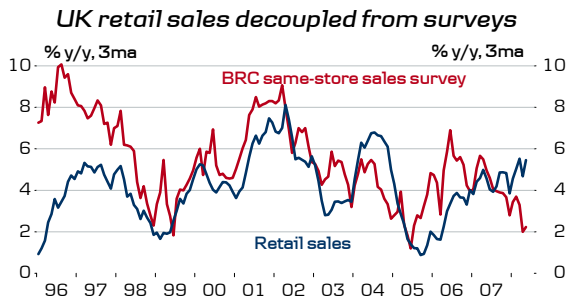
What to do with FX?

We currently believe the monetary policies of the Fed and the BoE are mostly mispriced in the market. Accordingly, from expectations to central bank moves, UK and US interest rates should decline most relative to other rates, putting downward pressure on both currencies. In contrast, we disagree less with expectations to BOJ and RBA. As a consequence, we recommend selling USD/JPY.



Source: Ecowin

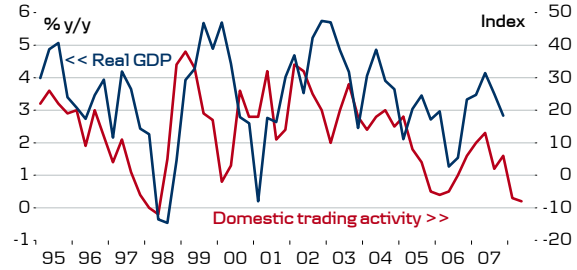
We also recommend selling GBP against either EUR or RBA. Better than expected UK retail sales figures due to warm weather in May provided some sterling strength last week. However, we regard that as a one-off event with real underlying weakness in the numbers and we believe hard data will soon show a more depressing picture. We recommend buying EUR/GBP, looking for a move to 0.82 within 3 months.



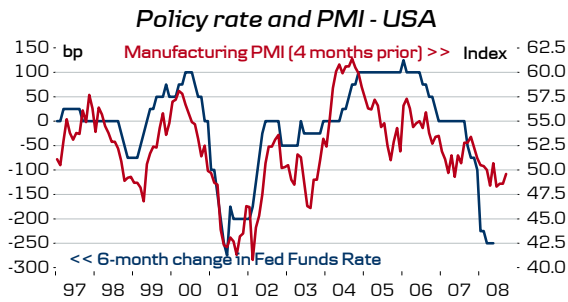
Source: Ecowin

Finally, we continue to be biased for NZD weakness. As with GBP earlier, the combination of an overvalued currency, a substantial current account deficit and a shift in the domestic business cycle points to considerable losses in the coming months.

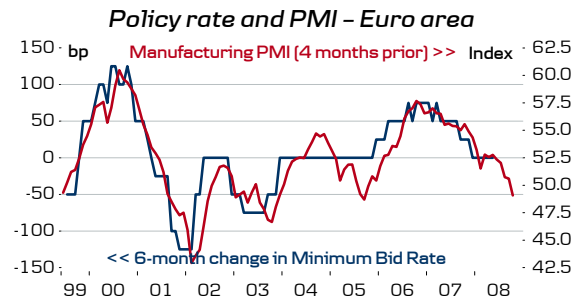
Kiwi economic growth is set to slow significantly



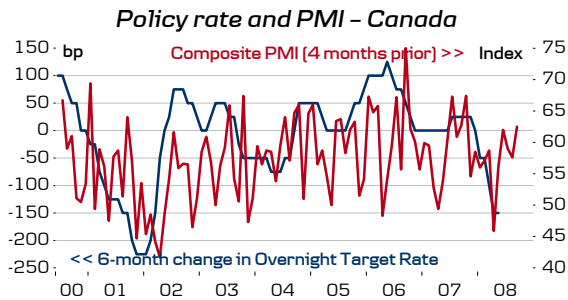
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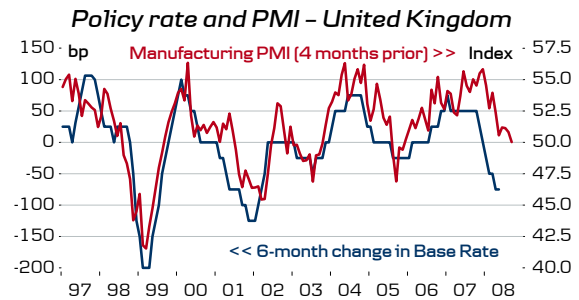
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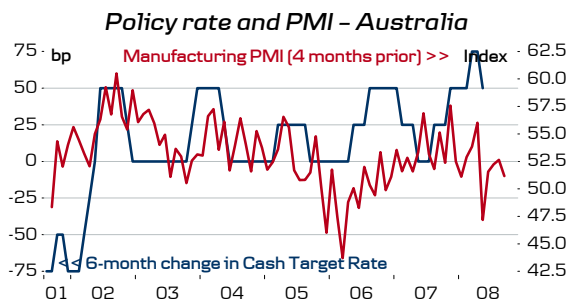
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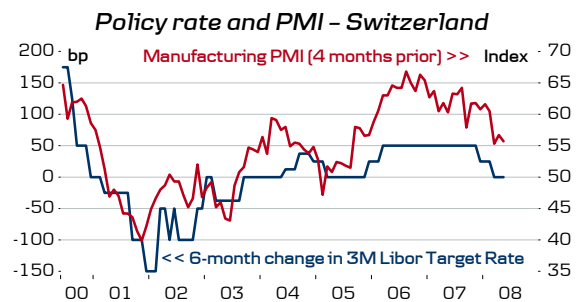
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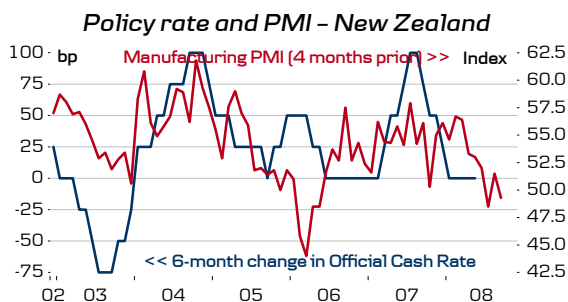
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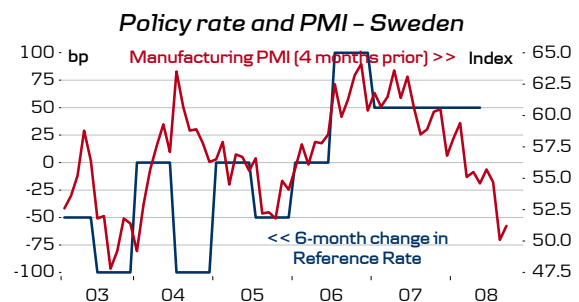
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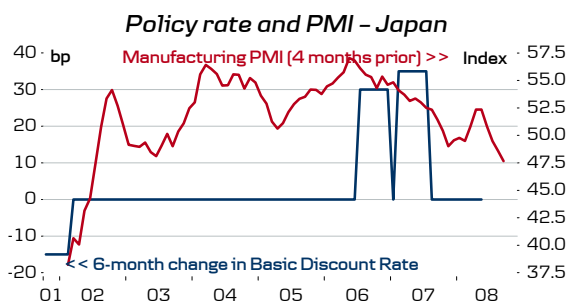
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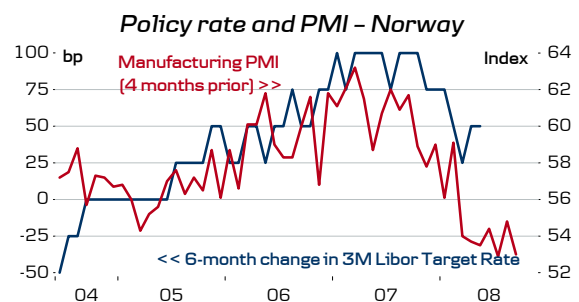
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G10: Imposed FX risk from oil inflation

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Has the recent surge in oil prices left the FX market with misalignments?

Introductory summary

Global oil prices have been increasing rapidly since 2002, and have repeatedly set new record highs. While price growth has been fairly stable, with prices close to doubling every second year, the past year has seen important changes. Not only has the pace of price increases accelerated, but volatility has also picked up significantly. In this article we revisit the relation between oil prices and exchange rates, given this changed environment. Our overall conclusions are that:

- There is a link between the oil price and exchange rates.
- In the long term, the link is stronger in real terms (i.e. when oil prices and exchange rates are corrected for inflation).
- In the short term the link between the oil price and exchange varies between periods of no relation and periods of a very strong relation.
- In the short term the link shifts between being positive and negative for most G10 currencies.
- Given the latest surge in the oil price we see increased upside risk on EUR/USD and EUR/JPY, and increased downside risk on USD/CAD and EUR/NOK (USD/NOK).

Should we expect a strong link?

While oil prices certainly play an important role in the debate on exchange rates, surprisingly little research has been done on the subject. In the research that has been done, however, three important results have been found:

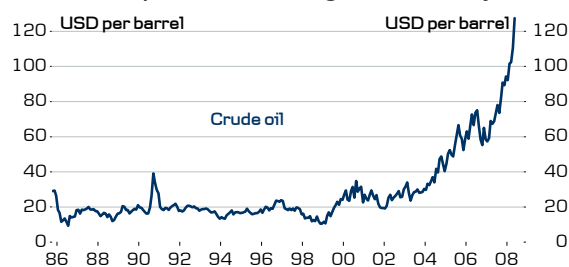
- There is a link between the real oil price and real exchange rates.
- The real oil price has forecasting power over future real exchange rates.
- This link is stronger over longer horizons.

One explanation for the link between the oil price and exchange rates is related to the purchasing

power parity (PPP). Increases in the world oil price will affect the overall price level differently in different countries, since the share of oil in total consumption varies across countries. This change in relative prices feeds into exchange rates.

For those engaged in foreign exchange trading, the link between real oil prices and real exchange rates is, however, of less importance, given that it is not possible to (directly) trade real exchange rates (real exchange rates are computed by adjusting the nominal exchange rate for the inflation differential between the two economies). Thus in this article we focus instead on the link between the *nominal* oil price and *nominal* exchange rates.

World oil prices have surged in recent years



Source: Reuters EcoWin

Utilizing a rolling regression window

Looking at nominal exchange rates and the nominal oil price can, however, potentially create some difficulties. While there is a long-term relation between the levels of the variables in real terms (i.e. a cointegration relation), this may not hold for the nominal series. We have therefore looked at the relation between the percentage change in nominal exchange rates and the percentage change in the nominal oil price. More specifically, we consider a regression of the return on trade-weighted nominal exchange rates on the monthly change in oil prices. As a measure of the oil price we use the price on North Sea Brent crude oil.

To allow for the fact that the relation between the oil price and exchange rates may change over time, we have applied a rolling regression window of four years. In other words, we initially run a regression on the first four years of data, and then repeat this, moving the sample window one month each time.

The results of these regressions are shown on the next page. The graphs show the parameter of the oil price, i.e. by what factor a one percent increase in the oil price feeds into the return on the effective exchange rate. If the parameter is above (below) zero, then an increase in the oil price leads to a stronger (weaker) currency. The graphs also shows the +/- 2 standard deviations of the parameter, which is a measure of the "precision" of the estimation. The tighter the band, the more precise is the estimation. When the entire band is above or below zero it implies that the result is statistically significant. The red lines in the graphs are explained later and can simply be ignored for now.

Three general observations can be made from the graphs:

- (i) **The oil parameter shifts between being positive or negative for most of the currencies, i.e. there is no stable link for any of the currencies.**
- (ii) **The oil parameter fluctuates around zero for most of the currencies, i.e. for most of the currencies there is, on average, no link to the oil price.**
- (iii) **The oil parameter is generally positive (though not significant) for NOK and SEK, while no consistent relation can be found for the other currencies.**

Considering daily data

In order to see more clearly how the sensitivity of exchange rates to oil prices fluctuates over time, we have also considered a shorter regression window. Using daily data we have repeated the analysis, but using a rolling estimation window of just one year. The results are shown on page 11.

From the graphs it can be seen that the oil parameter tends to fluctuate much more for the one-year estimation window than for the four-year window. This suggests that the link between oil prices and exchange rates might be very regime-dependent. In other words, in some periods there is a strong link and in others there is only a weak link or even a reverse relation.

It can also be seen that the results for some of the currencies are quite different to those obtained in the original regression using a longer estimation window and monthly data. For example, the large positive parameter for JPY in the period 1990-1994 can no longer be found. This is most likely a result of the difference between using daily or monthly data, and could indicate that there has been a positive relation between the oil price and JPY, but that it works with a lag. This would explain why it is not found in the daily data, given that the lagged oil price is not included in the regression. There is also found a difference between the two estimation results for EUR, SEK, CHF, and USD.

Finally, it can be seen that sensitivity to oil price changes tends to have increased in recent years. In the table below we have divided the G10 currencies into groups according to their current sensitivity to oil price changes.

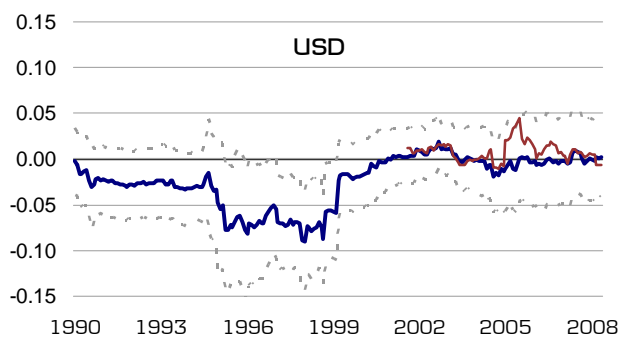
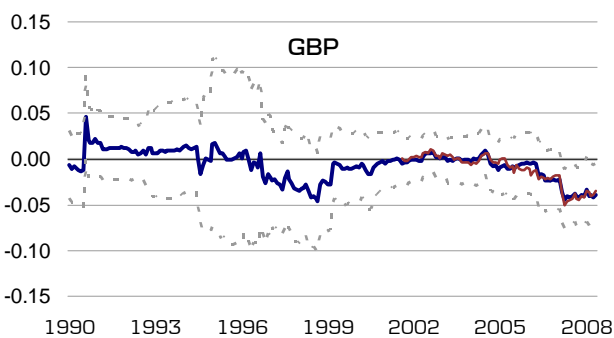
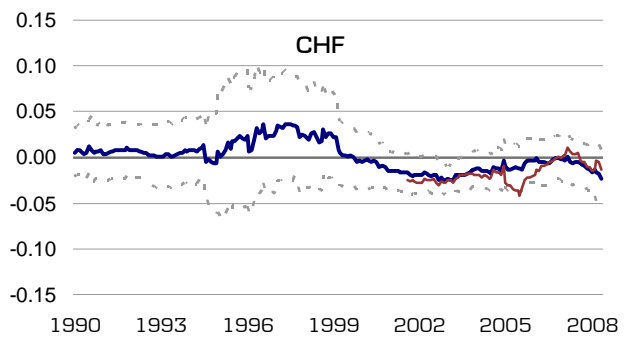
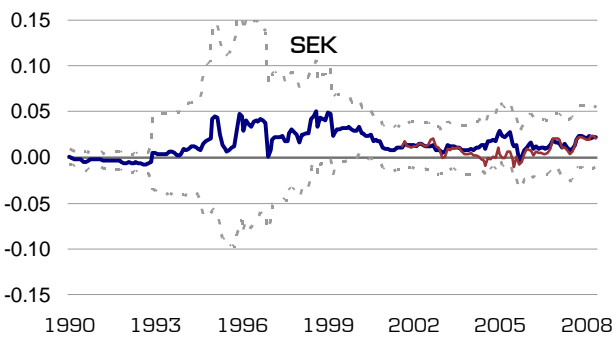
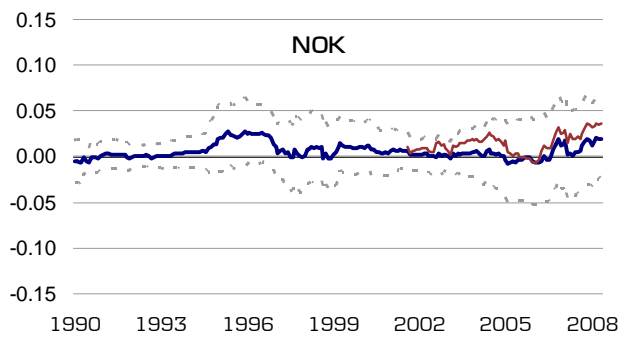
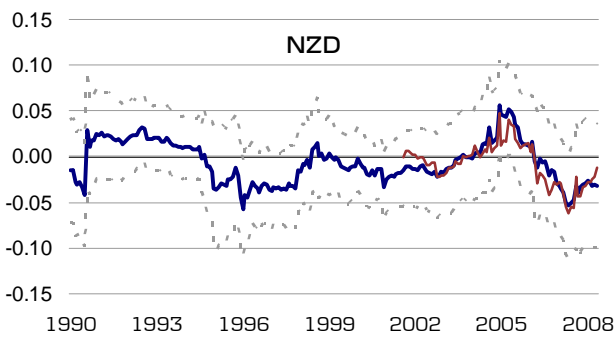
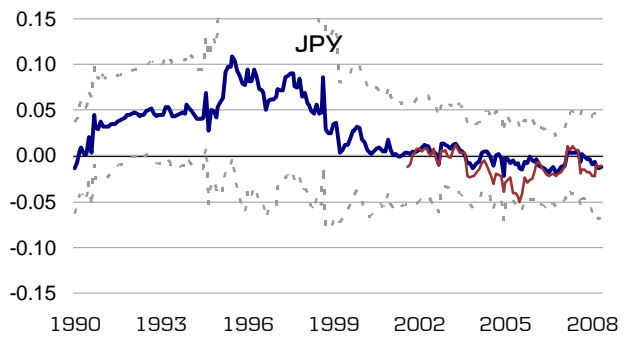
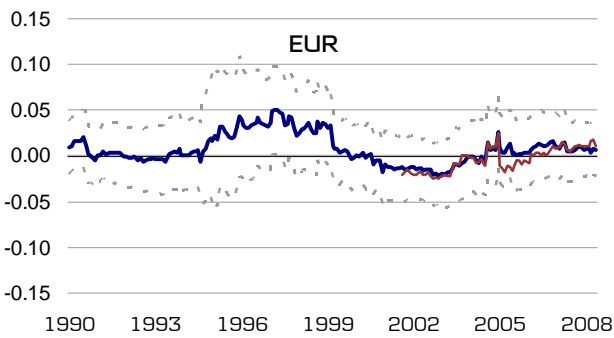
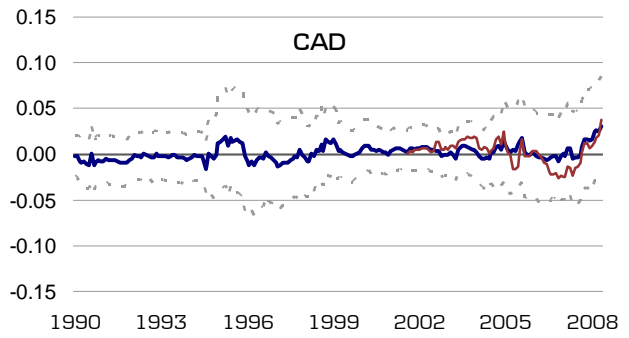
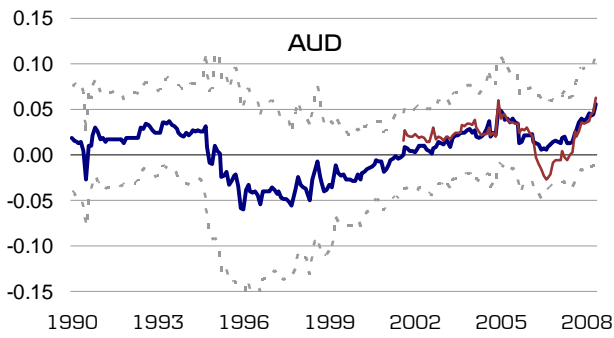
Table 1: Sensitivity to the oil price

Currency	Oil parameter	
CAD	0.105	} Positive
AUD	0.095	
NOK	0.071	
NZD	0.067	
EUR	0.042	
SEK	0.023	} Neutral
GBP	0.007	
CHF	-0.010	
JPY	-0.056	} Negative
USD	-0.059	

Source: Danske Bank estimates

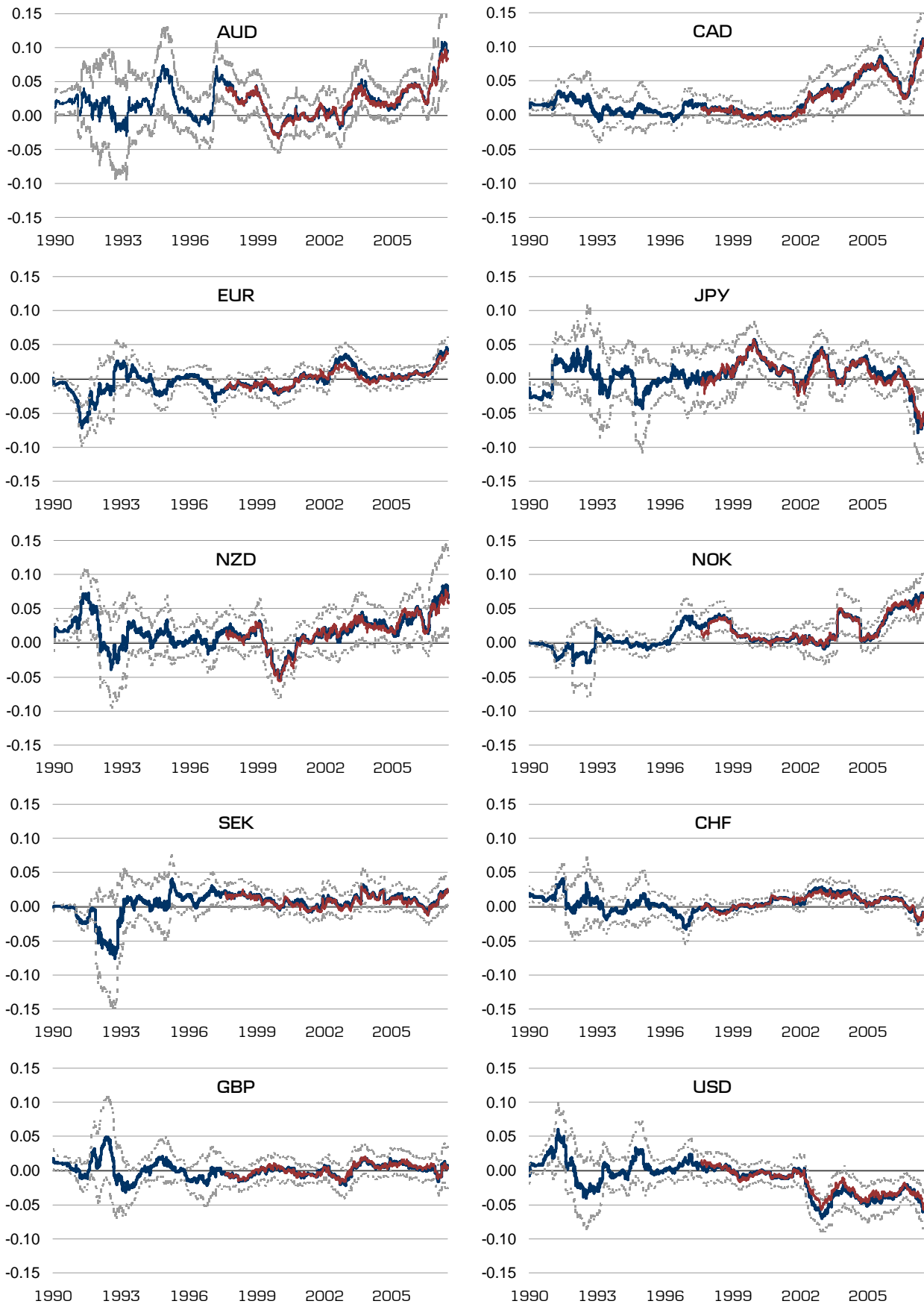
Not surprisingly, it is the commodity currencies CAD, AUD, NOK and NZD that are positively related to the oil price. Somewhat puzzlingly, EUR is also in this group. SEK, GBP and CHF are all found to be neutral to oil price changes, while the USD and JPY are found to weaken when the oil price increases. That the JPY is negatively related to the oil price can be explained by Japan's absence of natural resources, while the negative relation for the USD most likely can be explained by a large consumption of energy combined with the Fed's commitment to secure high economic growth.

Oil parameters, 4-year rolling regression window (Monthly data)



Note: The blue line indicates the oil price coefficient in the rolling regression. The grey lines indicate +/- 2std of the oil coefficient. The red line indicates the oil price coefficient, when the trade weighted 2-year swap spread is included in the regression.

Oil parameters, 1-year rolling regression window (Daily data)



Note: The blue line indicates the oil price coefficient in the rolling regression. The grey lines indicate ± 2 std of the oil coefficient. The red line indicates the oil price coefficient, when the trade weighted 2-year swap spread is included in the regression.

Are there currently any misalignments in prices?

Based on these results, a natural question to ask is whether there currently appears to be any misalignments in the G10 currency pairs following the recent surge in oil prices. That is, are there any currency pairs that have moved less than what we would expect? Given the results in table 1, we have focussed on five currency pairs:

- **USD/CAD**

From the table it can be seen that, all else being equal, we would expect USD/CAD to fall when the oil price increases. However, USD/CAD has been broadly flat this year, trading around parity. As a result, our short-term fair value models are pointing to a large misalignment at present. One explanation for the missing reaction in USD/CAD is recent movements in relative interest rates. Indeed, the 3-year swap spread has moved from -73bp in early March to +31bp today. However, while dampening the downward effect of the high oil price, it should not have been enough to keep USD/CAD from falling. This suggests that the downside risk on USD/CAD has increased.

- **AUD/USD and NZD/USD**

AUD/USD and NZD/USD would also be expected to move upwards as oil prices have surged - which they have. In fact both pairs are trading around our short-term fair value estimates, and while the NZD has lost value recently, this can be fully explained by movements in relative interest rates. Interest rate spreads have been working against the NZD lately, as the RBNZ is signalling an intention to lower rates, while interest rates have moved higher in the major economies as the inflation scare has taken a firmer hold.

- **EUR/USD**

EUR/USD should also be expected to experience upward pressure as the oil price increases. In our short-term model, the recent \$30-increase in oil prices does in fact translate into a rise in EUR/USD of 9 big figures. Or put differently, a \$30 drop in oil would reduce the fair value estimate, all other things being equal, from 1.6050 to 1.5150. While the recent re-pricing in money and bond markets has caused a narrowing of the interest rate spread, this only translates into a fall of 2.5 figures, and is thus

not enough to explain the flat EUR/USD. All in all, this suggests that the upside risk on EUR/USD has increased.

- **EUR/NOK (USD/NOK)**

EUR/NOK has also moved less than might have been anticipated from the surge in oil prices - and indeed it has even moved higher in recent months. While the interest rate spread has narrowed as the ECB has become more hawkish, NOK still appears expensive according to short-term valuation models. The downside risk on EUR/NOK has thus increased given the current high oil price.

- **EUR/JPY**

Finally, EUR/JPY stands out as a cross that should currently be sensitive to the oil price. While our short-term fair value models only establish a weak link to oil prices, they do point to a small undervaluation of EUR/JPY at present. This result is in fact driven by the recent rise in oil prices, although the past month's weak stock markets and stable implied volatility is effectively dampening this upwards pressure. All in all, the recent spike in oil prices has likely increased the upside risk on EUR/JPY.

Robustness of the results

In order to test the robustness of these results, we have included another source of exchange rate movements in the regressions - relative interest rates. It might be that the link between oil price increases and exchange rate movements is blurred by the response of central banks. For example, during last autumn and the early part of this year the Fed cut interest rates quite aggressively in order to support economic growth. However, at the same time, oil prices were rising rapidly and driving up inflation. This led the ECB to stay on hold, and as a result the monetary policy spread to the US widened, thereby helping EUR/USD to set new record highs. In recent months, however, Fed concerns have shifted more towards inflation, and as a result the recent high oil prices have not caused a similar upward pressure on EUR/USD via changes in relative interest rates.

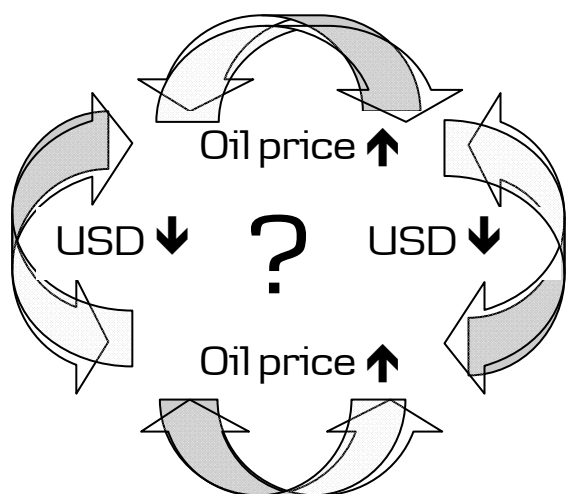
To account for this effect from monetary policy, we have repeated the rolling regression analysis, only now also including the trade-weighted 2-year swap spread. The oil parameter from this regression is

shown as the red line in the graphs above. Since the trade-weighted interest rate spread series are shorter, the estimates only run from 2001. Generally speaking, including relative interest rates does not change the results significantly. However, for some of the currencies an effect can be seen. For example, for NOK the conditional oil parameter is systematically higher than the unconditional for the monthly data. This suggests that NOK would strengthen more as oil prices rise if monetary policy did not act to dampen this effect.

So which way does causality run?

Lately there has also been an increasing focus on the causality between the oil price and exchange rates - with focus centred, in particular, on the EUR/USD and oil-price correlation. In other words, is it the high oil price that causes the high EUR/USD, or is it the high EUR/USD that causes the high oil price?

The EUR/USD and oil price causality puzzle



That oil price shocks should affect exchange rates is easy to understand, although the effect works through several channels. These were discussed more thoroughly in *FX Crossroads: FX implications of rising food and energy prices*, 28 May 2008. Among these channels is the direct impact on inflation. Given that energy constitutes a different share of the consumption basket across different countries, oil price increases will also initially affect CPI inflation by a different degree across countries, thereby inducing a change in the exchange. The opposite case, that exchange rate shocks should affect the oil price is perhaps somewhat more difficult to comprehend. Several possible explanations

are, however, provided in the literature. For a short overview of these see *IMF: World Economic Outlook, box 1.4*, April 2008. Of the various explanations, the cost channel is perhaps the most cited. This states that because oil, like most other commodities, is priced in dollars then a weaker dollar implies that producers in non-dollar regions will see profits decline. As a response to this, they will raise prices in dollar terms (this of course assuming that producers can in fact influence the world market price).

Statistical evidence on causality

While theory offers more or less plausible arguments for causality in either direction, the empirical evidence does not. Causality tests performed by, among others, Amano and Norden (1998) and Chaudhuri and Daniel (1998) point to causality running from the oil price to real exchange rates, but not the other way. This suggests that the current high oil price is not due to the weak dollar, but that the high oil price might help explain why the dollar is currently weak.

To test this hypothesis on recent data, we have applied the Granger causality test on EUR/USD and the nominal oil price. Using data from 1987-2008, we cannot reject the notion that oil price shocks affect EUR/USD, but we can reject the hypothesis that shocks to EUR/USD affect the oil price. Interestingly, however, we cannot disprove that causality runs both ways when we only use the past two years' data. It should be noted, though, that this test is very sensitive to, among other things, the chosen length of lag of the series.

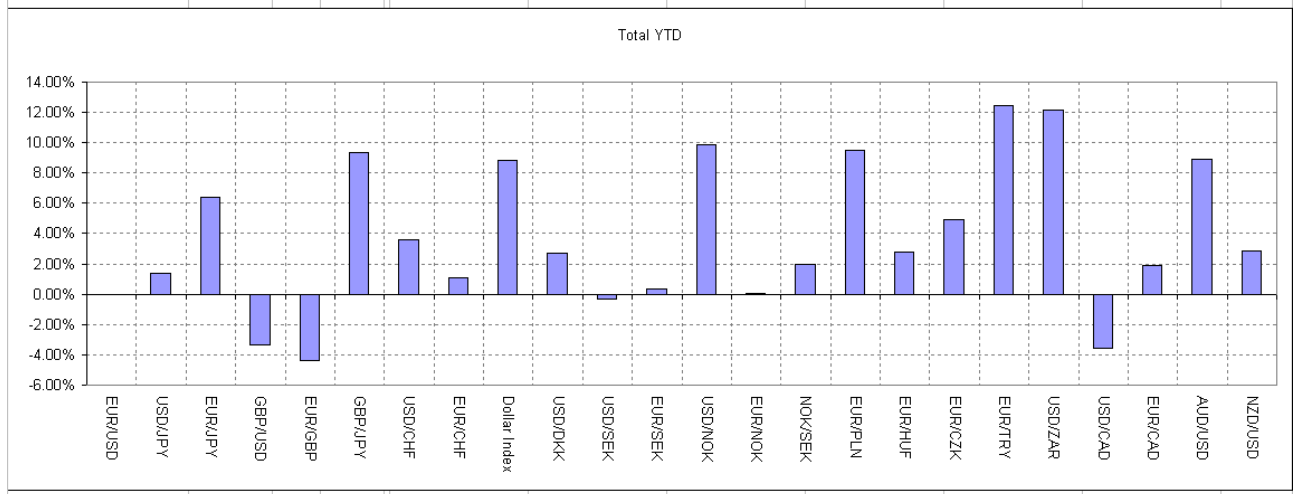
Conclusion

Empirical evidence suggests that there is a link between the oil price and exchange rates - even in nominal terms. However, this link varies a lot in the short term, and the relation appears to be very regime-dependent. During the recent acceleration in oil prices, the oil-price sensitivity of most G10 currencies has increased. In the current environment we identify CAD, AUD, NOK, NZD and EUR as positively related to the oil price, SEK, GBP and CHF as neutral to oil price changes, and the USD and JPY as negatively related. Considering recent months' movements in the G10 currencies we furthermore consider the high oil price to have increased the upside risk on EUR/USD and EUR/JPY, while having

increased the downside risk on EUR/NOK and USD/CAD.

Trading Points

MARKET	LAST	Trend	5DCHG	Strategy	Stop/Entry	1st Target	2nd Target	Stop/Reverse	New Target	Total YTD
CURRENCIES - Majors										
EUR/USD	1.5582	↕	0.31%	Go Long>	1.5651	1.5818	Go Short<	1.5460	1.5386	-0.01%
USD/JPY	107.91	↕	0.03%	Go Long>	108.21	109.14	Go Short<	107.11	106.01	1.35%
EUR/JPY	168.15	↗	0.34%	LONG		168.61	169.24	166.75	165.82	6.44%
GBP/USD	1.9700	↕	0.51%	Go Long>	1.9790	2.0000	Go Short<	1.9580	1.9410	-3.34%
EUR/GBP	0.7908	↕	-0.24%	Go Long>	0.7963	0.8103	Go Short<	0.7849	0.7822	-4.37%
GBP/JPY	212.59	↗	0.54%	LONG		213.70	215.60	211.09	208.68	9.39%
USD/CHF	1.0412	↕	0.48%	Go Long>	1.0540	1.0622	Go Short<	1.0306	1.0240	3.56%
EUR/CHF	1.6222	↕	0.78%	LONG		1.6295	1.6406	1.6128	1.6060	1.06%
Dollar Index	73.214	↕	-0.003	Go Long>	73.6520	73.990	Go Short<	72.927	72.645	8.83%
CURRENCIES - Scandies										
USD/DKK	4.7867	↘	-0.30%	Go Long>	4.8215	4.8467	Go Short<	4.7650	4.7471	2.69%
USD/SEK	6.0403	↗	-0.05%	Go Long>	6.0796	6.1715	Go Short<	6.0039	5.9492	-0.34%
EUR/SEK	9.4119	↗	0.25%	LONG		9.4320	9.4621	9.3811	9.3545	0.33%
USD/NOK	5.1087	↘	-1.15%	Go Long>	5.2019	5.2311	Go Short<	5.1002	5.0670	9.88%
EUR/NOK	7.9602	↘	-0.86%	Go Long>	8.0368	8.1017	Go Short<	7.9505	7.9223	0.06%
NOK/SEK	1.1825	↗	1.15%	LONG		1.1864		1.1668	1.1578	1.94%
CURRENCIES - Non Majors										
EUR/PLN	3.3585	↘	-0.52%	SHORT		3.3460		3.3733	3.3807	9.49%
EUR/HUF	237.29	↘	-2.55%	SHORT		236.40		240.97	250.00	2.80%
EUR/CZK	24.082	↘	0.31%	Go Long>	24.269	24.398	Go Short<	23.976	23.778	4.95%
EUR/TRY	1.9086	↗	0.08%	Go Long>	1.9376	1.9757	Go Short<	1.8890	1.8657	12.43%
USD/ZAR	7.9762	↕	-0.44%	LONG		8.1152	8.2798	7.9690	7.8745	12.12%
USD/CAD	1.0116	↘	-0.55%	SHORT		1.0043		1.0200	1.0238	-3.55%
EUR/CAD	1.5761	↘	-0.26%	Go Long>	1.5898	1.5963	Go Short<	1.5667	1.5487	1.93%
AUD/USD	0.9563	↗	0.97%	Go Long>	0.9587	0.9648	Go Short<	0.9491	0.9450	8.92%
NZD/USD	0.7569	↕	-0.34%	Go Long>	0.7641	0.7739	Go Short<	0.7554	0.7518	2.89%



Trading recommendations and G10 central bank overview

Directional trades

	Date	Start	Now	Target	Stop	P/L (incl carry)
Open						
Sell NZD/NOK	16/06/08	3.910	3.8521	3.7500	4.0000	1.44
Sell USD/JPY	19/06/08	107.85	107.97	105.00	109.25	-0.14
Buy EUR/GBP	19/06/08	0.7860	0.7908	0.8000	0.7760	0.63
Recently closed						
Buy EUR/GBP	07/05/08	0.7885	0.7885	0.8100	0.7885	-0.06
Sell NZD/USD	08/05/08	0.7740	0.7548	0.7400	0.7950	2.01
Sell EUR/CHF	08/05/08	1.6195	1.6152	1.5800	1.6400	0.03
P/L 2008	6.03%	Open	2.07%	Closed	3.96%	
# of trades *	108	# of trades 2008	23			
- average net gain	0.35%	- average net gain	0.26%			
- batting average	0.51	- batting average	0.48			

* Since 17 November 2005

Central bank overview

Country	Official interest rate	Policy rate	Next decision*	Last change
United States	Federal funds rate	2.00	25 Jun (unch)	30 Apr (-25bp)
Euroland	Minimum bid rate	4.00	3 July (+25bp)	6 June 07 (+25bp)
Japan	Overnight call rate	0.50	15 Jul (unch)	21 Feb 07 (+25bp)
United Kingdom	Base rate	5.00	10 Jul (unch)	10 Apr (-25bp)
Switzerland	3-month Libor	2.75	18 Sep (+25bp)	13 Sep 07 (+25bp)
Canada	Overnight rate	3.00	15 Jul (unch)	22 Apr (-50bp)
Australia	Cash rate	7.25	1 Jul (unch)	4 Mar (+25bp)
New Zealand	Cash rate	8.25	24 Jul (unch)	25 Jun 07 (+25bp)
Sweden	Repo rate	4.25	3 July (+25bp)	13 Feb (+25bp)
Norway	Sight deposit rate	5.50	25 Jun (unch)	23 Apr (+25bp)

* Expected decision in brackets

G10 central bank forecast overview

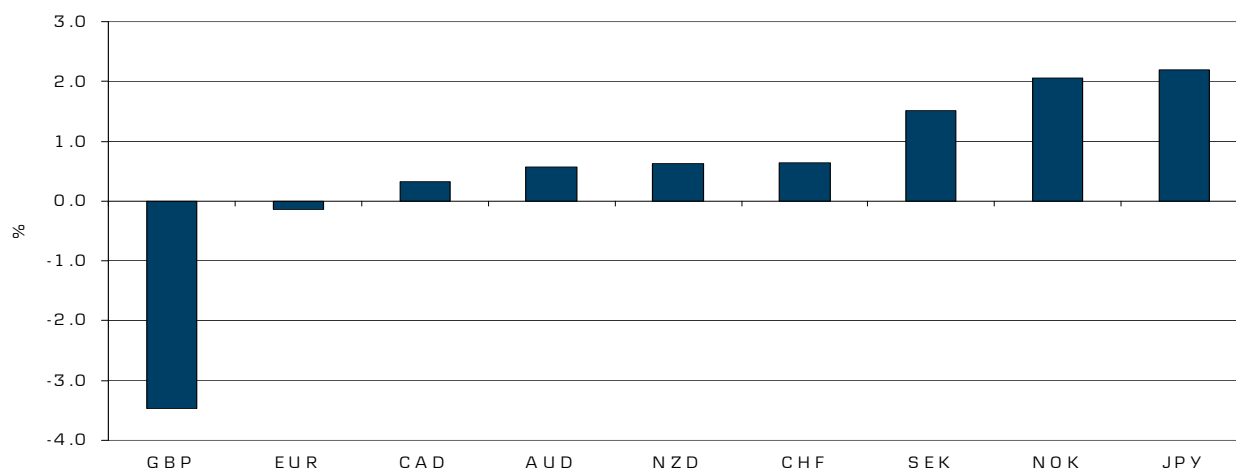
	FED	BOC	ECB	BOE	SNB	RB	NB	BOJ	RBA	RBNZ
Now	2.00	3.00	4.00	5.00	2.75	4.25	5.50	0.50	7.25	8.25
2008 Jun	25-Jun	10-Jun	05-Jun	05-Jun	19-Jun		25-Jun	13-Jun	03-Jun	05-Jun
Jul		15-Jul	03-Jul	10-Jul		03-Jul		15-Jul	01-Jul	24-Jul
Aug	05-Aug		07-Aug	07-Aug			13-Aug	19-Aug	05-Aug	
Sep	16-Sep	03-Sep	04-Sep	04-Sep	18-Sep	04-Sep	24-Sep	17-Sep	02-Sep	11-Sep
Oct	29-Oct	21-Oct	02-Oct	09-Oct		23-Oct	29-Oct	7+31-Oct	07-Oct	23-Oct
Nov			06-Nov	06-Nov				21-Nov	04-Nov	
Dec	16-Dec	09-Dec	04-Dec	04-Dec	11-Dec	17-Dec	17-Dec	19-Dec	02-Dec	04-Dec
2009 Jan	28-Jan							22-Jan		
Feb								19-Feb	03-Feb	
Mar								17-Mar	03-Mar	
Apr								7+28-Apr	07-Apr	
12M	2.00	3.00	4.25	4.50	3.00	4.50	5.75	0.50	7.25	7.25
Rate cut	Rate hike									

Exchange rate forecasts

	Spot	Forecast				Forecast vs forward outright, %			
		+1m	+3m	+6m	+12m	+1m	+3m	+6m	+12m
Exchangerates vs EUR									
USD	1.560	1.55	1.55	1.50	1.50	-0.5	-0.1	-2.9	-2.2
JPY	168.35	163	163	150	150	-3.0	-2.3	-8.9	-7.0
GBP	0.791	0.800	0.820	0.800	0.750	1.1	3.5	0.7	-6.0
CHF	1.622	1.62	1.60	1.58	1.56	0.1	-0.8	-1.5	-1.7
DKK	7.46	7.46	7.46	7.46	7.46	0.0	0.0	0.0	-0.1
NOK	7.94	7.85	7.80	7.75	7.75	-1.2	-2.2	-3.2	-4.0
SEK	9.40	9.40	9.25	9.20	9.20	0.0	-1.7	-2.2	-2.3
PLN	3.36	3.45	3.45	3.50	3.55	2.6	2.3	3.5	4.4
CZK	24.07	25.60	25.60	25.75	26.00	6.4	6.5	7.3	8.8
HUF	237	250	250	255	260	5.1	4.5	5.6	5.9
TRY	1.91	1.95	1.95	2.05	2.20	1.0	-1.1	0.6	1.0
Exchangerates vs USD									
DXY	73.2	73.1	73.2	73.8	73.4	-0.2	-0.2	0.4	-0.3
JPY	108.0	105	105	100	100	-2.6	-2.2	-6.3	-5.0
GBP	1.97	1.94	1.89	1.88	2.00	-1.6	-3.5	-3.6	3.9
CHF	1.04	1.05	1.03	1.05	1.04	0.5	-0.6	1.5	0.5
DKK	4.78	4.81	4.81	4.97	4.97	0.5	0.1	3.0	2.3
NOK	5.09	5.06	5.03	5.17	5.17	-0.8	-2.1	-0.3	-1.8
SEK	6.03	6.06	5.97	6.13	6.13	0.4	-1.5	0.8	-0.1
CAD	1.01	1.01	1.01	1.02	1.02	-0.3	-0.3	0.6	0.5
AUD	0.96	0.95	0.95	0.90	0.85	-0.3	0.6	-3.5	-6.6
NZD	0.76	0.75	0.75	0.73	0.70	-0.4	0.6	-0.8	-2.7
ZAR	7.99	7.70	7.70	8.10	8.40	-4.4	-6.1	-3.5	-4.7
BRL	1.60	1.65	1.67	1.70	1.75	2.1	1.9	1.5	0.1
MXN	10.29	10.30	10.35	10.55	10.70	-0.3	-0.7	0.0	-1.1
CNY	6.87	6.90	6.83	6.68	6.48	0.8	0.8	0.3	0.3

Note: GBP, AUD and NZD are denominated in local currency rather than USD

Expected change in USD vs forwards, 3 m



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Risk warning

Major risks connected with recommendations or opinions in this report, including as sensitivity analysis of relevant assumptions, are stated throughout the text.

Expected updates

FX Crossroads is updated every week.

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