

# FX Crossroads

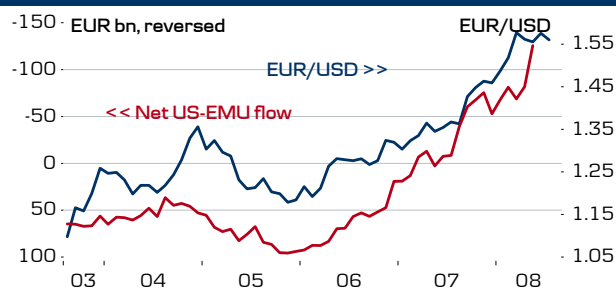
06 August 2008

## EUR: Where's my 75bn?

### Summary and conclusions

- The latest flow-of-funds report from the euro area paints a disturbing picture. In annual terms, the broad basic balance (net of current account, direct investment and portfolio flows) shows a deficit of EUR 47.5bn. The deficit is of a recent nature and owes partly to a surprise revision that has weakened the flow-of-funds by EUR 75bn during the past year. Historically, the EUR correlates well with capital flows; hence, **the current net outflow must be seen as a yellow flag for the euro, considering its rapid rise**. A likely explanation of the euro's continued ascent despite the aggregated capital drain is a substantial improvement in the bilateral flows between the euro area and the US. That swing owes particularly to aggressive net selling of US securities by EMU investors since last summer.
- We take a look at a topic mostly neglected in the academic literature, but widely discussed among traders, ie, **the seasonal pattern of exchange rates**. After a general discussion on the statistical characteristics, where we list some stylized facts on the seasonality in FX markets, we develop a simple FX model in order to exploit the seasonal patterns. We find that the model is unable to generate an excess return out of sample, which suggests that **investors should be careful when trying to take advantage of seasonal patterns**. However, following seasonal patterns can be profitable when periods and currency pairs are carefully selected.
- *FX Crossroads* is published every second Wednesday. Next publication date is 20 August 2008.

EUR/USD and net US-EMU securities flow (12M sum)



Source: Ecwin, Danske Bank

Accumulated return of seasonal strategy model



Note: Weights are calculated from 1993 to 2004. Red area represents out-of-sample estimations  
Source: Reuters Ecwin, Danske Bank

# Has anybody seen my missing EUR75bn?

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## Net capital outflow puts euro rise at risk, at least if the financial crisis fades.

The latest flow-of-funds report from the euro area points a disturbing picture. In annual terms, the broad basic balance (net of current account, direct investment and portfolio flows) is showing a deficit of EUR47.5bn. The deficit is of a recent nature, and owes partly to a substantial revision that has weakened the flow-of-funds by EUR75bn during the past year.

Historically, the euro correlates well with capital flows and the current net outflow must thus be seen as cautious for the euro, considering its rapid rise.

One possible explanation behind the mismatch between currency performance and capital flows can be a divergence of bilateral flows. However, only few currencies have bettered the performance of the euro this year, most notably CZK, HUF and PLN. Of these only Poland has seen an increase in net capital inflows, leaving at least part of this explanation as somewhat unsatisfactory.

However, we also see a substantial improvement in the bilateral capital flows between the euro area and the US. From a net flow to the US of about EUR100bn in 2005, the net inflow to the euro area from the US has risen to EUR125bn. That swing owes partly to increased demand for euro securities by US investors, but particularly to aggressive net selling of US securities by EMU investors since last summer.

Since the net selling is most dramatic when it comes to debt instruments, it is not difficult to relate the shift to the financial crisis that only really began to attract headlines in August 2007.

Overall though, a net capital outflow and a sharp deterioration in the economic cycle are raising the bar for further outperformance of the already overvalued euro. Specifically, should the US financial markets calm, or dollar weakness cause investors to again see US securities as attractive, a shift in bilateral capital flows could well coincide with a lower move in the euro/dollar rate.

## Flow-of-funds turns negative

The latest flow-of-funds report from the euro area points to a disturbing picture. Seen over the past three months as well as over the past year, Euro-land is now suffering a net capital outflow. The outflow arises from a (modest) current account deficit, a substantial net direct investment outflow and a reduction in the portfolio inflow. The broad basic balance (C/A + FDI + net portfolio flows) is now showing a deficit over the past year of EUR47.5bn. Excluding bonds, the deficit on the narrow basic balance is EUR85bn. (See table below for details.)

### EUR flow of funds, new series vs previous, EUR bn

EUR bn	30/5/08	3m MA	Last 12m
Current account	-7.3	-6.1	-5.8
FDI	-10.4	-21.1	-209.8
Portfolio flow	23.0	8.3	168.1
- net bond	15.9	9.2	38.2
- net equity	7.2	-0.9	129.9
Basic balance (1)	-10.6	-28.1	-85.6
Broad basic balance (2)	5.3	-18.9	-47.5

1) C/A + FDI + net equity

2) C/A + FDI + net portfolio

Source: Ecwin, Danske Bank

The latest, sharp deterioration in net capital flows has come as a surprise, and owes partly to a substantial revision in the underlying series. The table below shows the current result in the year to April 2008 as well as the unrevised series. Whereas the current account has seen only a modest revision, we are left with a much sharper net FDI outflow as well as a reduction in the net portfolio inflow. In total, the broad basic balance has deteriorated by EUR74.8bn. Excluding bonds, the deterioration is more than EUR90bn.

### Flow of euro funds, new series vs previous, EURbn

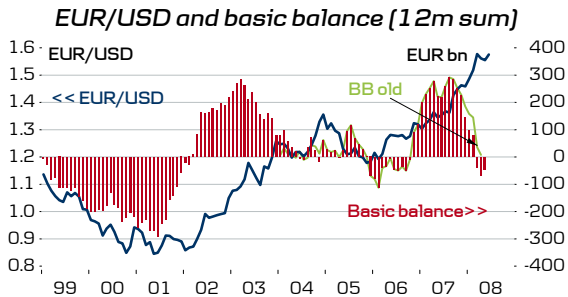
May 2007 - April 2008	New	Previous	Difference
Current account	2.2	0.1	2.1
FDI	-225.2	-165.9	-59.3
Portfolio flow	156.4	173.9	-17.6
- net bond	22.7	7.0	15.7
- net equity	133.6	168.3	-34.6
Basic balance (1)	-89.4	2.5	-91.9
Broad basic balance (2)	-66.7	8.1	-74.8

1) C/A + FDI + net equity

2) C/A + FDI + net portfolio

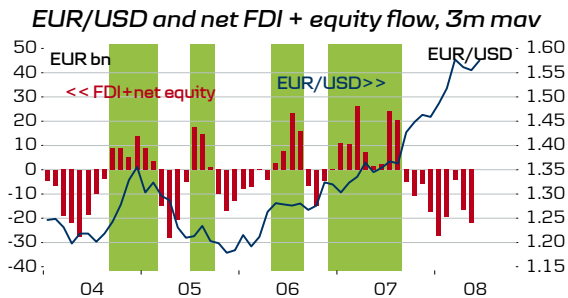
Source: Ecwin, Danske Bank

The net result is that the basic balance has shifted to an annual deficit for the first time since 2006. Since this deficit has coincided with a sharp rise in the value of the euro, the question is: **who's buying the euro?**



Source: Ecwin, Danske Bank

Although not perfect the euro has historically been well correlated with capital flows, particularly the sum of net direct investment and net equity flows. As the following chart shows, it is highly unusual to see a significant rise in the euro against a persistent capital drain.

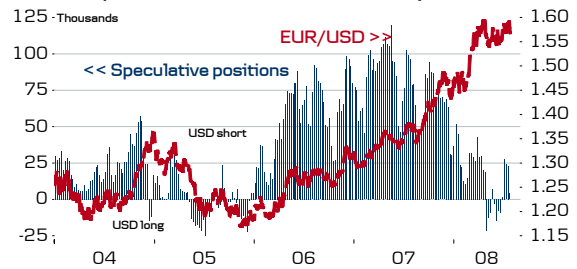


Source: Ecwin, Danske Bank. Shaded areas denote a capital inflow.

Further, in contrast to prior episodes in 2004, 2006 and 2007, this year has seen a sharp decline in speculative euro longs to a point where positions are essentially flat. It is not possible, therefore, merely to point to a speculative frenzy as the driving force behind the rise in the euro.

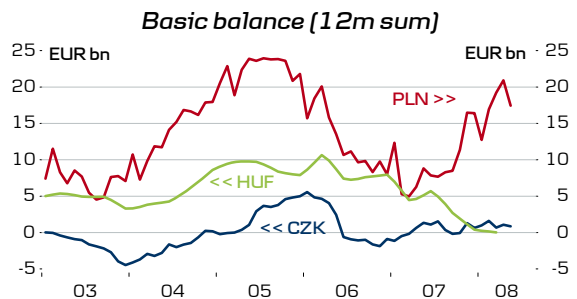
One possible explanation could be if the euro area experienced a bilateral capital outflow to countries against which the euro is falling, but that this capital outflow is offset by an inflow from currencies against which it is appreciating.

**EUR/USD and non-commercial positions**



Source: Ecwin, Danske Bank

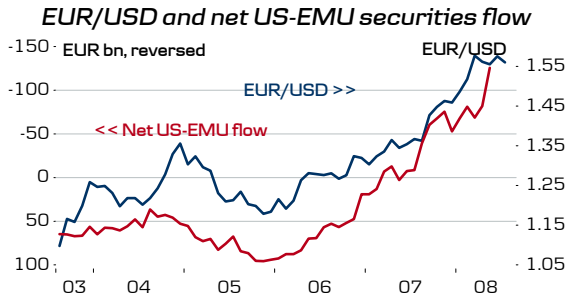
Year-to-date only CHF (1.3%), AUD (1.3%), MXN (2.1%), BRL (6.3%), HUF (8.4%), CZK (9.7%) and PLN (10.6%) have bettered the performance of the euro. The outperformance of AUD, MXN and BRL can be explained by relative economic strength and exposure to rising commodity prices. We believe it is much more difficult to justify the rise in HUF, CZK and PLN. To check the above hypothesis, we calculated basic balances for each of the three currencies (see following chart). As can be seen, only Poland has a rising net capital surplus and neither the Czech Republic nor Hungary can back the currency appreciation by capital inflows. These findings suggest that CEE currency strength cannot entirely be explained by currency inflows.



Source: Ecwin, Danske Bank

So far we have looked only at absolute capital flows – that is, the net amount of flows between one country and the rest of the world. Bilateral flows are difficult to obtain, since few countries publish country-specific flows. However, we can use the US TICS database to get a glimpse of the bilateral flows between the US and Euroland. A number of caveats must be observed, not least that US securities destined for clients in the euro area but traded initially through, say, London, will not be reported as a flow to the Euroland.

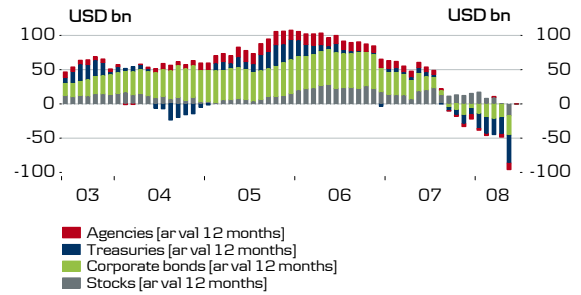
The following chart shows the net amount of US buying of euro-denominated securities and EMU buying of US securities plotted against the euro/US dollar. As can be seen the rise in the euro/dollar rate coincides with a significant net selling of US assets, currently to the tune of EUR125bn annually.



Source: Ecwin, Danske Bank

The substantial shift in capital flows in favour of the euro has primarily occurred as Euroland investors have sold US securities aggressively since last summer, particularly debt-related instruments (see chart). It is not difficult to relate this shift to the financial crisis that got under way in August 2007.

Net buying of US securities by EMU investors



Source: Ecwin, Danske Bank

# Seasonal patterns in FX markets

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## Introduction

In this article we take a look at a topic mostly neglected in the academic literature, but widely discussed among traders, namely the seasonal pattern of exchange rates. After a general discussion on the statistical characteristics where we list some stylized facts on the seasonality in FX markets, we develop a simple FX model in order to exploit the seasonal patterns. We find that the model is unable to generate an excess return out of sample, which suggests that investors should be careful when trying to take advantage of seasonal patterns. However, following seasonal patterns can be profitable when selecting periods and currency pairs is done carefully.

## A grain of truth or just pure rubbish?

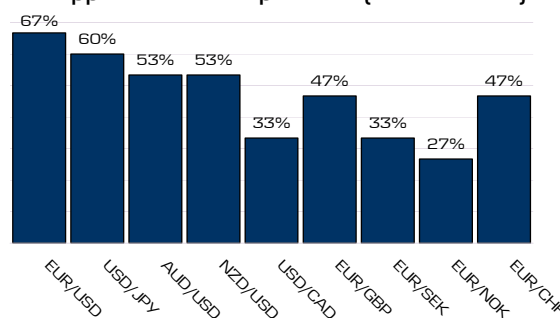
A rather controversial proposition is that currencies tend to behave in certain patterns over a given year and that this pattern repeats itself. Believers in the efficient market hypothesis will of course argue that this can never happen in efficient markets as rational expectations will ensure that market participants arbitrage such occurrences away immediately. But one thing is theory; another thing is how things really work.

Without digging too much into what should and what should not take place, we will instead let data speak for itself. By using data for the period 1993-2007 (post-EMS), we are able to establish some stylised facts on exchange rate movements in certain months. For simplicity, we focus on the most well-known currency pairs in the G10 universe. Other pairs could have been chosen which potentially could have altered results.

Interesting would be to look at the seasonal pattern for the next month, September. As can be seen from the chart, most currency pairs have either risen or fallen in approximately the same amount of years, indicating that no seasonal pattern can be established. But some currency pairs, e.g. EUR/USD and EUR/NOK, tend to either appreciate or depreciate in

September, suggesting that some seasonal pattern might be present. This can, of course, just be a coincidence and rely entirely on specific, non-correlated events in that period but it can also indicate that these currency pairs behave in a specific pattern due to factors that repeat themselves year after year.

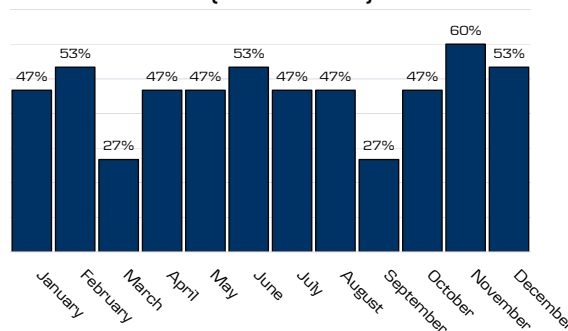
Share of years in which currency pairs have appreciated in September (1993-2007)



Source: Reuters Ecowin, Danske Bank

Perhaps a good example of the latter is the behaviour of EUR/NOK in a given year. By looking at the seasonal pattern, we find that the pair tends to go lower in March and September. In fact, EUR/NOK has fallen in 11 out of the last 15 years. Is this a coincidence or is there a genuine reason?

Share of years where EUR/NOK has appreciated (1993-2007)



Source: Reuters Ecowin, Danske Bank

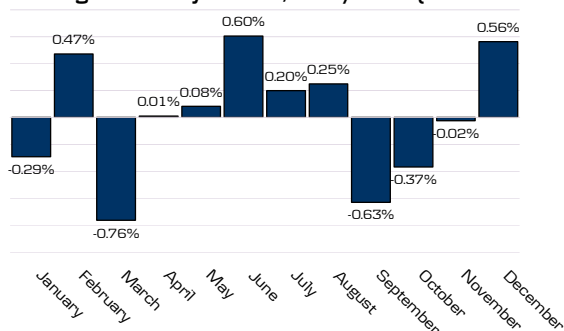
One explanation could be that Norwegian oil taxes fall due on 1 October and 1 April. In theory, these should have zero impact on money market rates and

exchange rates since Norges Bank aims to offset them through liquidity provisions prior to tax payments. In practice, short-term money market rates rise relatively sharply when petroleum taxes fall due and the NOK tends to strengthen in the months prior to the petroleum tax payments.

Opponents to this will of course argue that the payment of oil taxes shouldn't come as a surprise to companies and that they therefore should buy NOK in months other than March and September or use currency options to ensure the required NOK amount. But some companies might have reasons for not buying NOK a long time before.

The average monthly return for EUR/NOK has (in absolute terms) been highest in March and September. As seen from the chart, EUR/NOK has on average fallen 0.76% and 0.63% in March and September, respectively, over the past 15 years. In other months, June and December, the pair has risen considerably. None of these effects are, however, statistically significant (at a 10% confidence level).

Average monthly return, EUR/NOK (1993-2007)



Source: Reuters Ecowin, Danske Bank

Not all currency pairs possess such clear seasonal patterns as EUR/NOK. Furthermore, no obvious explanations can be found even when detecting possible patterns. We are however able to detect some seasonal trends from the past 15 years without necessarily trying to explain why these have occurred:

- 1) EUR/NOK tends to go lower in March and September. Probably due to oil taxes.
- 2) EUR/USD tends to go higher in December and lower in January. These effects have previously offset each other.
- 3) USD tends to outperform CAD in July

- 4) NZD tends to outperform USD in Q4
- 5) No clear seasonal pattern can be drawn for SEK and CHF

### A simple seasonal FX model

If attaching some probability that history will repeat itself, i.e. that the seasonal pattern observed in the past will persist in the future, how can we exploit our newly acquired knowledge? One way would be to build a small model in-sample and test it out-of-sample.

Firstly, we calculate the monthly returns (incl. carry) over the period 1993-2004, i.e. 12 years. Secondly, we identify the three best performing currency pairs in each month. It will be our strategies to take positions in these in all years. Thirdly, we attach weights to these three currencies from their relative monthly return. For example, a higher monthly return for one currency pair in a given month will give a higher weight in that specific month. Weights are fixed in the whole sample period. Fourthly, by using the strategies and the weights from step two and three, we calculate our excess return from our seasonal model.

Average monthly return (incl. carry)

	EUR/USD	USD/JPY	AUD/USD	NZD/USD	USD/CAD	EUR/GBP	EUR/SEK	EUR/NOK	EUR/CHF
January	-1.5%	1.1%	0.5%	0.6%	-0.1%	-0.7%	-0.3%	-0.3%	0.3%
February	-0.2%	-0.7%	0.1%	0.1%	0.0%	0.6%	0.5%	0.5%	0.0%
March	0.1%	-0.8%	-0.4%	-0.3%	0.3%	-0.7%	0.3%	-0.8%	-0.5%
April	-0.2%	0.0%	0.3%	0.8%	-0.3%	-0.3%	-0.8%	0.0%	0.3%
May	0.7%	-0.6%	-0.3%	-0.3%	-0.2%	0.7%	0.2%	0.1%	-0.4%
June	0.2%	-0.6%	0.1%	0.3%	-0.5%	-0.3%	0.3%	0.6%	0.3%
July	-0.5%	0.9%	-0.7%	-0.7%	1.4%	-0.3%	0.6%	0.2%	-0.6%
August	0.0%	-0.7%	-0.3%	-0.6%	-0.1%	0.6%	0.0%	0.2%	-0.2%
September	1.7%	0.1%	-0.4%	-0.2%	-0.5%	0.1%	-0.3%	-0.8%	-0.5%
October	0.1%	-1.2%	1.0%	0.9%	-0.4%	-0.5%	-0.6%	-0.4%	0.0%
November	-0.5%	1.0%	1.0%	1.3%	0.2%	-0.1%	0.3%	0.0%	0.4%
December	1.6%	0.4%	0.5%	1.4%	0.1%	0.2%	0.2%	0.6%	0.0%

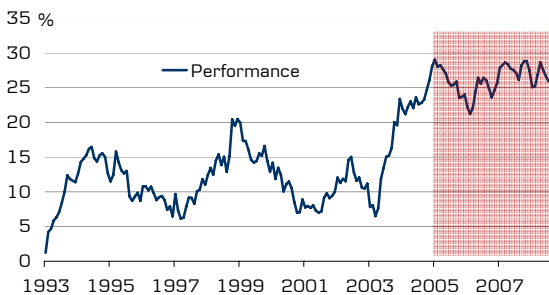
Source: Reuters Ecowin, Danske Bank

As can be seen from the table, we find many strategies for some currency pairs, while few for others and even none for one. For EUR/USD we detect four strategies, for USD/JPY not less than nine, for AUD/USD five strategies, six for NZD/USD, three for USD/CAD, four strategies for EUR/GBP, two for EUR/SEK, three for EUR/NOK and finally none for EUR/CHF. Only very few of these are statistically significant, but the underlying assumption is that the most significant ones will get greater weights and accordingly impact mostly on the final result.

The performance of the model can be seen from the chart below. At least three things are worth noticing: 1) Performance has been positive over the whole sample period (1993-2008), i.e. if we had had

our knowledge on seasonal patterns in 1993 and exploited it as suggested above, the model would have yielded an accumulated return of 26% (average annual return 1.6%, average monthly return 0.14%). 2) The out-of-sample performance is far from convincing as the post-2004 period has generated a negative result. The model yielded a rather large deficit in 2005, modest surpluses in 2006-07 and a small deficit in 2008. 3) The monthly return has been rather volatile (standard deviation 1.44%). The volatility is, perhaps slightly surprisingly, larger in-sample compared with the out-of-sample period.

**Accumulated return of seasonal strategy model**



Note: Weights are calculated from 1993-2004. Red area represents out-of-sample estimations  
Source: Reuters Ecowin, Danske Bank

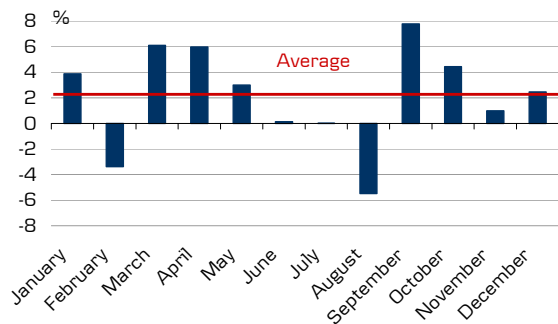
Perhaps the biggest take-away from the model is the insight that following monthly seasonal patterns pays off well in some years (e.g. 1993, 1998, 2003) while bad in other years (1999-2000). This can have several explanations; one might be that months aren't the right frequency to use. Perhaps it is better to divide data into quarters or even odd periods. We leave that to further analysis. Another explanation is that no seasonal FX patterns exist, which means that no systematic return should be generated from following a seasonal model.

We can squeeze a little more insight out of the result above. In some months, following a seasonal strategy has worked better than in other months. And furthermore, following seasonal patterns in the suggested months are more profitable for some currency pairs than for others. Specifically, we find that:

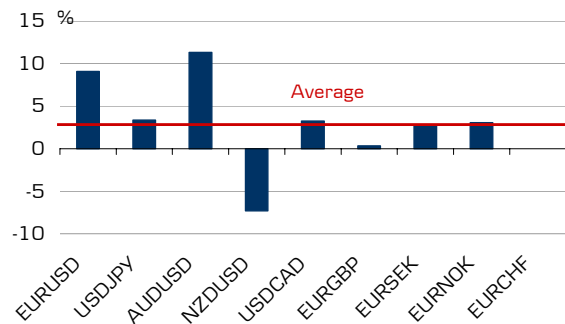
- 1) *March, April and September are best when trying to exploit seasonal patterns. Following the suggested strategies in these months has yielded 20% from 1993-2008.*

- 2) *August and to some extent February are the worst months when trying to follow a seasonal strategy.*
- 3) *EUR/USD and AUD/USD are the best currency pairs when trying to exploit seasonal patterns in the suggested manner. Establishing short and long positions in these pairs in months implied by the model have yielded a 20% profit from 1993-2008.*
- 4) *NZD/USD is the most tricky currency pair to benefit from. Despite active in half of the year, the pair generates an accumulated negative contribution to the total performance.*

**Accumulated return on months (1993-2008)**



**Accumulated return on currency pairs (1993-2008)**



Source: Reuters Ecowin, Danske Bank

**Concluding remarks**

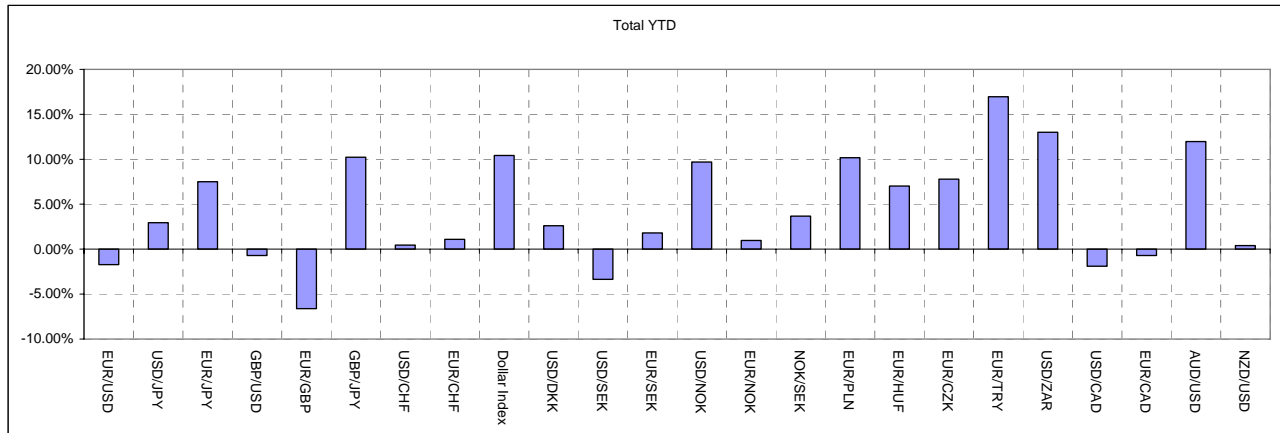
'Tread cautiously!' is perhaps the best advice to investors that wish to exploit seasonal patterns in FX markets. On the one hand, it can't be concluded that seasonal patterns are non-existent. But on the other hand, no systematic profit has been generated in recent years from following strategies relying on seasonal patterns derived from the past. However, this does not exclude the possibility that convincing seasonal patterns can be detected over time, especially if these are backed by valid explanations.

# Trading Points

## Today's Trading Signals

06/08/2008 8:13 (CET)

Strategy (Short- Medium Term)										
MARKET	LAST	Trend	5DCHG	Strategy	Stop/Entry	1st Target	2nd Target	Stop/Reverse	New Target	Total YTD
<b>CURRENCIES - Majors</b>										
EUR/USD	1.5501	↓	-0.48%	Go Long>	1.5630	1.5679	Go Short<	1.5449	1.5245	-1.73%
USD/JPY	108.34	↑	0.19%	Go Long>	108.59	109.44	Go Short<	107.28	106.65	2.95%
EUR/JPY	167.95	↓	-0.28%	Go Long>	169.18	170.46	Go Short<	166.87	166.42	7.50%
GBP/USD	1.9553	↓	-1.34%	Go Long>	1.9628	1.9760	Go Short<	1.9522	1.9219	-0.70%
EUR/GBP	0.7927	↑	0.84%	LONG		0.7979		0.7880	0.7822	-6.62%
GBP/JPY	211.86	↓	-1.13%	Go Long>	212.46	214.60	Go Short<	210.60	209.88	10.21%
USD/CHF	1.0513	↓	0.28%	Go Long>	1.0560	1.0699	Go Short<	1.0481	1.0400	0.44%
EUR/CHF	1.6297	↓	-0.20%	Go Long>	1.6349	1.6479	Go Short<	1.6291	1.6228	1.08%
Dollar Index	73.796	↑	0.006	Go Long>	73.9900	74.712	Go Short<	73.563	73.132	10.41%
<b>CURRENCIES - Scandies</b>										
USD/DKK	4.8131	↑	0.48%	Go Long>	4.8295	4.8889	Go Short<	4.7897	4.7723	2.61%
USD/SEK	6.0903	↑	0.51%	Go Long>	6.1202	6.2039	Go Short<	6.0709	6.0438	-3.37%
EUR/SEK	9.4407	↓	0.02%	Go Long>	9.4803	9.5000	Go Short<	9.4100	9.3675	1.81%
USD/NOK	5.1819	↑	0.56%	Go Long>	5.2025	5.2258	Go Short<	5.1620	5.1078	9.69%
EUR/NOK	8.0326	↓	0.07%	LONG		8.0709		8.0057	7.9690	0.97%
NOK/SEK	1.1753	↓	-0.05%	SHORT		1.1685		1.1820	1.1868	3.67%
<b>CURRENCIES - Non Majors</b>										
EUR/PLN	3.2189	↑	0.45%	LONG		3.2589		3.1952	3.1824	10.17%
EUR/HUF	234.73	↑	1.70%	LONG		237.07		230.29	228.01	7.02%
EUR/CZK	23.959	↓	0.50%	SHORT		23.581		24.155	24.341	7.78%
EUR/TRY	1.7862	↓	-1.66%	SHORT		1.7824	1.7491	1.8157	1.8564	16.95%
USD/ZAR	7.3643	↑	-0.37%	Go Long>	7.4212	7.5492	Go Short<	7.2342	7.0937	13.00%
USD/CAD	1.0429	↑	1.91%	LONG		1.0456	1.0591	1.0262	1.0165	-1.90%
EUR/CAD	1.6162	↑	1.42%	Go Long>	1.6201	1.6321	Go Short<	1.5984	1.5803	-0.70%
AUD/USD	0.9183	↓	-2.78%	Go Long>	0.9301	0.9409	Go Short<	0.9134	0.8954	11.97%
NZD/USD	0.7258	↓	-1.18%	SHORT		0.7183	0.7134	0.7335	0.7404	0.40%



## Trading recommendations and G10 central bank overview

### Directional trades

	Date	Start	Now	Target	Stop	P/L (incl carry)
<b>Open</b>						
We have no open trading recommendations currently						
<b>Recently closed</b>						
Buy EUR/GBP	19/06/08	0.7860	0.8000	0.8000	0.7870	1.74
Buy EUR/GBP	11/07/08	0.7996	0.7890	0.8150	0.7890	-1.40
Sell GBP/SEK	24/07/08	12.0000	11.9700	11.6500	12.1000	0.24
<b>P/L 2008</b>	<b>8.27%</b>	<b>Open</b>	<b>0.00%</b>	<b>Closed</b>	<b>8.27%</b>	
<b># of trades *</b>	<b>110</b>	<b># of trades 2008</b>		<b>25</b>		
- average net gain	0.36%	- average net gain		0.33%		
- batting average	0.52	- batting average		0.52		

\* Since 17 November 2005

### Central bank overview

Country	Official interest rate	Policy rate	Next decision*	Last change
United States	Federal funds rate	2.00	16 Sep (unch)	30 Apr (-25bp)
Euroland	Minimum bid rate	4.25	7 Aug (unch)	3 July (+25bp)
Japan	Overnight call rate	0.50	19 Aug (unch)	21 Feb 07 (+25bp)
United Kingdom	Base rate	5.00	7 Aug (unch)	10 Apr (-25bp)
Switzerland	3-month Libor	2.75	18 Sep (+25bp)	13 Sep 07 (+25bp)
Canada	Overnight rate	3.00	3 Sep (unch)	22 Apr (-50bp)
Australia	Cash rate	7.25	2 Sep (unch)	4 Mar (+25bp)
New Zealand	Cash rate	8.00	11 Sep (-25bp)	23 Jul (-25bp)
Sweden	Repo rate	4.50	4 Sep (+25bp)	3 July (+25bp)
Norway	Sight deposit rate	5.75	13 Aug (unch)	23 Apr (+25bp)

\* Expected decision in brackets

### G10 central bank forecast overview

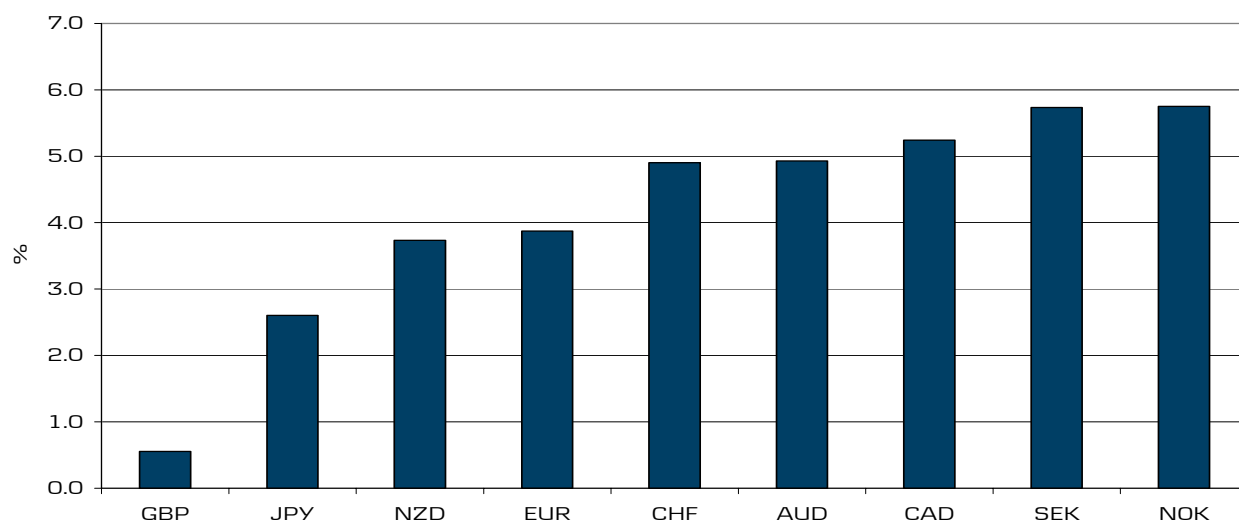
	FED	BOC	ECB	BOE	SNB	RB	NB	BOJ	RBA	RBNZ
<b>Now</b>	<b>2.00</b>	<b>3.00</b>	<b>4.25</b>	<b>5.00</b>	<b>2.75</b>	<b>4.50</b>	<b>5.75</b>	<b>0.50</b>	<b>7.25</b>	<b>8.0</b>
2008 Aug	05-Aug		07-Aug	07-Aug			13-Aug	19-Aug	05-Aug	
Sep	16-Sep	03-Sep	04-Sep	04-Sep	18-Sep	04-Sep	24-Sep	17-Sep	02-Sep	11-Sep
Oct	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							04-Feb	19-Feb	03-Feb	
Mar	17-Mar						25-Mar	17-Mar	03-Mar	
Apr	29-Apr							7+28-Apr	07-Apr	
May							06-May			
June	24-Jun						24-Jun			
July										
<b>12M</b>	<b>2.00</b>	<b>3.50</b>	<b>4.25</b>	<b>4.50</b>	<b>3.00</b>	<b>4.75</b>	<b>6.00</b>	<b>0.50</b>	<b>7.00</b>	<b>7.00</b>
Rate cut	Rate hike									

## Exchange rate forecasts

	Spot	Forecast				Forecast vs forward outright, %			
		+1m	+3m	+6m	+12m	+1m	+3m	+6m	+12m
<b>Exchange rates vs EUR</b>									
USD	1.548	1.58	1.60	1.55	1.50	2.3	3.9	1.1	-1.4
JPY	167.79	166	168	155	150	-0.8	1.2	-5.6	-6.6
GBP	0.792	0.800	0.820	0.800	0.780	0.9	3.3	0.6	-2.1
CHF	1.629	1.61	1.60	1.58	1.56	-1.0	-1.2	-1.9	-2.2
DKK	7.46	7.46	7.46	7.46	7.46	0.0	-0.1	-0.1	-0.1
NOK	8.03	8.00	7.90	7.75	7.75	-0.5	-2.0	-4.3	-5.0
SEK	9.44	9.40	9.25	9.20	9.20	-0.4	-2.0	-2.6	-2.8
PLN	3.23	3.40	3.40	3.40	3.45	5.2	4.9	4.7	5.6
CZK	23.99	24.00	24.00	24.25	24.50	0.1	0.3	1.7	3.5
HUF	237	240	240	245	250	1.1	0.6	2.0	2.6
TRY	1.79	1.90	1.90	1.95	2.05	4.8	2.7	2.2	1.4
<b>Exchange rates vs USD</b>									
DXY	73.8	72.1	71.1	71.6	72.7	-2.4	-3.9	-3.3	-2.0
JPY	108.4	105	105	100	100	-3.0	-2.6	-6.6	-5.4
GBP	1.95	1.98	1.95	1.94	1.92	1.3	0.6	0.5	0.7
CHF	1.05	1.02	1.00	1.02	1.04	-3.1	-4.9	-3.0	-0.8
DKK	4.82	4.72	4.66	4.81	4.97	-2.2	-3.8	-1.2	1.3
NOK	5.19	5.06	4.94	5.00	5.17	-2.7	-5.8	-5.4	-3.7
SEK	6.10	5.95	5.78	5.94	6.13	-2.6	-5.7	-3.7	-1.4
CAD	1.04	1.02	0.99	1.00	1.00	-2.3	-5.2	-4.3	-4.3
AUD	0.92	0.94	0.98	0.95	0.90	3.1	8.2	5.9	2.1
NZD	0.72	0.74	0.74	0.73	0.70	2.8	3.7	3.5	1.2
ZAR	7.43	7.85	7.85	8.10	8.40	4.9	3.2	4.3	3.9
BRL	1.57	1.62	1.62	1.67	1.70	2.2	0.6	1.4	-1.3
MXN	9.92	10.30	10.35	10.55	10.70	3.3	2.9	3.5	2.4
CNY	6.85	6.90	6.79	6.63	6.53	0.9	-0.2	-1.4	-0.9

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

## Expected change in USD vs forwards, 3m



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