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# Exchange Rate Perspectives

## FEER v. BEER: Battle of the valuation models



### Special Report

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## Currency Forecasts

### Industrialized Countries

		Spot Rate	3M	6M	12M
<b>US \$ Exchange Rates</b>					
U.S.	DB US\$ Index	67	67	68	72
		-	-	-	-
Euro	US\$/Euro	1.33	1.35	1.30	1.20
	(Fwd. Rates)	-	1.33	1.33	1.33
Japan	Yen/US\$	89	91	92	95
	(Fwd. Rates)	-	88	88	88
U.K.	US\$/£	1.58	1.59	1.53	1.45
	(Fwd. Rates)	-	1.58	1.58	1.58
Canada	C\$/US\$	1.00	0.98	0.98	1.00
	(Fwd. Rates)	-	1.00	1.00	1.01
Australia	US\$/A\$	1.05	1.06	1.04	1.00
	(Fwd. Rates)	-	1.05	1.04	1.03
N.Z.	US\$/NZ\$	0.84	0.83	0.83	0.80
	(Fwd. Rates)	-	0.84	0.83	0.82
Switzerland	Sfr/US\$	0.93	0.93	0.96	1.04
	(Fwd. Rates)	-	0.93	0.93	0.92
<b>Euro Cross Rates</b>					
Japan	Yen/Euro	118	122	120	114
	(Fwd. Rates)	-	118	118	118
U.K.	£/Euro	0.84	0.85	0.85	0.83
	(Fwd. Rates)	-	0.84	0.84	0.84
Switzerland	Sfr/Euro	1.24	1.25	1.25	1.25
	(Fwd. Rates)	-	1.24	1.24	1.23
Norway	Nkr/Euro	7.40	7.25	7.10	6.95
	(Fwd. Rates)	-	7.43	7.46	7.53
Sweden	Skr/Euro	8.69	8.50	8.20	8.00
	(Fwd. Rates)	-	8.71	8.73	8.77

Source: Datastream, Reuters, Bloomberg Finance LP, DB forecasts

### Asia

		Spot Rate	3M	6M	12M
<b>China</b>					
China	CNY/USD	6.22	6.25	6.20	6.12
	(Fwd. Rates)	-	6.22	6.22	6.23
Hong Kong	HKD/USD	7.75	7.77	7.80	7.80
	(Fwd. Rates)	-	7.75	7.75	7.75
India	INR/USD	53.7	53.0	52.3	52.0
	(Fwd. Rates)	-	54.5	55.3	56.8
Indonesia	IDR/USD	9,625	9,900	9,950	9,875
	(Fwd. Rates)	-	9,695	9,927	10,162
Malaysia	MYR/USD	3.04	3.03	3.01	2.98
	(Fwd. Rates)	-	3.06	3.08	3.11
Philippines	PHP/USD	40.6	39.8	38.8	38.0
	(Fwd. Rates)	-	40.6	40.6	40.7
Singapore	SGD/USD	1.23	1.22	1.21	1.21
	(Fwd. Rates)	-	1.23	1.23	1.23
South Korea	KRW/USD	1,067	1,064	1,050	1,040
	(Fwd. Rates)	-	1,073	1,077	1,085
Taiwan	TWD/USD	29.0	29.0	28.5	28.3
	(Fwd. Rates)	-	28.9	28.8	28.6
Thailand	THB/USD	29.8	30.6	30.2	30.0
	(Fwd. Rates)	-	29.9	30.1	30.3

Source: Datastream, Reuters, Bloomberg Finance LP, DB forecasts

### Emerging Europe

		Spot Rate	3M	6M	12M
<b>Czech Rep.</b>					
Czech Rep.	Koruna/Euro	25.6	25.0	24.5	23.8
	(Fwd. Rates)	-	25.6	25.6	25.6
	Koruna/US\$	19.2	18.5	18.8	19.8
	(Fwd. Rates)	-	19.2	19.2	19.2
<b>Hungary</b>					
Hungary	Forint/Euro	294	280	280	280
	(Fwd. Rates)	-	297	300	305
	Forint/US\$	221	207	215	233
	(Fwd. Rates)	-	223	225	228
<b>Poland</b>					
Poland	Zloty/Euro	4.17	4.05	3.98	3.84
	(Fwd. Rates)	-	4.21	4.24	4.30
	Zloty/US\$	3.13	3.00	3.06	3.20
	(Fwd. Rates)	-	3.16	3.18	3.22
<b>Russia</b>					
Russia	Ruble/US\$	30.2	30.5	30.6	30.6
	(Fwd. Rates)	-	30.3	30.9	31.5
<b>Turkey</b>					
Turkey	Lira/US\$	1.77	1.80	1.80	1.85
	(Fwd. Rates)	-	1.79	1.81	1.85
<b>South Africa</b>					
South Africa	Rand/US\$	9.05	8.30	8.20	8.10
	(Fwd. Rates)	-	9.16	9.27	9.50

Source: Deutsche Bank

### Latin America

		Spot Rate	3M	6M	12M
<b>Currency</b>					
Argentina	ARS/USD	4.96	5.14	5.40	5.93
	(Fwd. Rates)	-	4.63	4.87	5.33
Brazil	BRL/USD	2.04	2.05	2.05	2.05
	(Fwd. Rates)	-	2.06	2.09	2.15
Chile	CLP/USD	471	476	490	505
	(Fwd. Rates)	-	477	482	492
Colombia	COP/USD	1,780	1,760	1,750	1,740
	(Fwd. Rates)	-	1,796	1,812	1,845
Mexico	MXN/USD	12.7	12.7	12.6	12.5
	(Fwd. Rates)	-	12.8	12.9	13.1

Source: Datastream, Reuters, Bloomberg Finance LP, DB forecasts

<b>G10 FX Forecasts: End of Quarter</b>					
	<b>Latest</b>	<b>2013</b>		<b>2014</b>	
	<b>23 Jan, 13</b>	<b>end-Q1</b>	<b>end-Q2</b>	<b>end-Q4</b>	<b>end-Q4</b>
<i><u>USD-crosses</u></i>					
EUR/USD	1.33	1.35	1.30	1.20	1.15
USD/JPY	89	91	92	95	95
GBP/USD	1.58	1.59	1.53	1.45	1.44
USD/CHF	0.93	0.93	0.96	1.04	1.07
AUD/USD	1.05	1.06	1.04	1.00	0.90
NZD/USD	0.84	0.83	0.83	0.80	0.72
USD/CAD	1.00	0.98	0.98	1.00	1.05
USD/SEK	6.53	6.30	6.31	6.67	6.70
USD/NOK	5.56	5.48	5.46	5.79	5.87
<i><u>EUR-crosses</u></i>					
EUR/JPY	118	122	120	114	109
EUR/GBP	0.84	0.85	0.85	0.83	0.80
EUR/CHF	1.24	1.25	1.25	1.25	1.23
EUR/SEK	8.69	8.50	8.20	8.00	7.70
EUR/NOK	7.40	7.25	7.10	6.95	6.75

Source: Deutsche Bank

## FX Views

### G10 Views

#### Euro

We look for EUR/USD to move up to 1.35 by end-Q1 before falling to 1.20 by the end of 2012. Amongst the ZIRP currencies, the euro has the strongest story over the coming months. The risk of another major Euro-area crisis is much lower thanks to the buffer provided by the ESM-OMT backstop, while the Euro-area current account balance has moved to a comfortable surplus. Portfolio outflows should also be smaller as economic weakness fosters home bias. Finally, the ECB is unlikely to be as aggressive as the Fed in easing. The US portfolio flow picture is likely to deteriorate on the back of an easy Fed and as US investors become more risk-taking relative to the rest of the world, encouraging outflows. An ECB policy response is the biggest risk to the view, likely first coming through verbal intervention, while negative rates are a last resort.

#### Japan

Two waves of QE by the Fed in the second half of 2012 did nothing to arrest the yen weakening trend. Instead, deteriorating flow including a heavily negative narrow basic balance of payments (current account + FDI) set the tone. We believe there is more yen weakness to come. Foreigners hold an above-trend stock of money market funds and a large positive balance of short-term loans that encompasses foreign asset hedges is ripe to be reduced. Further action by the BoJ or MoF to reflate the economy will help the trend, but is not essential. Of course some will be concerned that the pace of yen weakness warrants concern for a correction, but history suggests it is better to follow rather than to fade such moves. We like to be long USD/JPY looking for 95 by year end.

#### United Kingdom

We recommend buying EUR/GBP and selling the GBP TWI as poor AAA fundamentals in the absence of Eurozone tail risk, a resumption of portfolio outflows and higher monetary policy uncertainty should all weigh on GBP next year.

2013 could be the year where the market begins to price risks of more unconventional BoE policy. First, the economy has failed to respond to additional stimulus while the exchange rate remains too strong to support external rebalancing. The UK's trade deficit is close to unchanged from last year. Second, Mark Carney replaces Governor King in June, having already signaled a more open mind on unconventional policy, inclusive of nominal GDP targeting. Third, Chancellor Osborne has also signaled a willingness to openly discuss a shift away from inflation targeting. Fourth, medium-term UK inflation expectations have dropped to cycle lows, suggesting plenty of potential for upside surprise in the event of monetary policy change.

Beyond monetary policy, reduced tail risk in Europe will also have important implications for GBP, because the Eurozone crisis has shielded the UK from a rapidly deteriorating flow picture. This worsening in the UK basic balance is likely to pick up as a driver in coming quarters.

#### Switzerland

The SNB did a good job of defending the 1.20 floor last year. With Switzerland still benefiting from one of the largest current account surpluses in the world, we're not looking for EUR/CHF to run away towards PPP above 1.35 any time soon. But, we continue to see good risk reward in holding tactical longs to 1.25.

First, Swiss inflation should start turning more convincingly higher this year. A big rise would put the SNB's policy framework into question, seeing renewed pressure on the floor as the market speculates over SNB exit. A slow rise would, in contrast, be negative for the currency by lowering real yields. We expect the latter, with CPI respecting the leads-lags with past currency appreciation well, troughing earlier this year and turning moderately higher since. Past relationships suggest the pass-through of a stabilizing EUR/CHF should show up in moderate inflation next year, reaching the SNB forecast of 0.5% y/y by end-2013. Gradually rising inflation should see a more convincing decline in Swiss real yields, particularly versus Germany where the rate differential is only now beginning to turn. It should also be negative for the currency, with Swiss real yields remaining high despite zero rates.

Second, CHF remains vulnerable to a withdrawal of "safe haven" inflows. Data is lagged, but the recently released net international investment position for 2011 is informative of where these inflows lie. While the Swiss have continued buying offshore assets, most of the inflow since the crisis began has found its way into bank deposits (chart). Not only are these less "sticky", but are increasingly earning zero or negative yields as domestic banks hike charges. SNB intervention data in 2012 suggests that more than 140bn EUR of such inflow "rests" in Swiss bank deposits, susceptible to withdrawal irrespective of Swiss C/A dynamics.

In sum, the medium-term EUR/CHF drivers may not be turning, but with real yields moving lower, Eurozone tail receding and more than 140bn EUR of capital inflows earning flat or negative returns, the odds of a capital outflow in 2013 are rising.

### **Canada**

CAD will lag as fiscal drag will likely still weigh on the US economy even after the "fiscal cliff" deal. CAD valuations are also expensive on BEER metrics. We do look for CAD outperformance later in the year as pent-up demand boosts US growth (trends in US manufacturing remain a key driver of trends in CAD), but for now we would be long AUD/CAD and NZD/CAD. Another way to trade CAD weakness (especially relative to other risk trades) is through a contingent option. A 2 year S&P call with a strike 4% above current spot, contingent on USD/CAD fixing at least 2% higher on maturity, is at time of writing indicatively priced at 1.7% of notional, a huge discount versus 7% for the vanilla.

### **Australia and New Zealand**

We expect AUD and NZD to continue to be supported by the extremely easy monetary policy in the major economies and the resulting improvement in the global economy. However both have valuation constraints on longer-term metrics, so we are looking to buy dips – especially dips in AUD/JPY and NZD/JPY, which we would buy on dips to 88 and 69.50 respectively.

Out of the three commodity currencies we are especially positive on AUD given our view that AUD in particular among the G10 currencies will be boosted by improving sentiment on Chinese prospects. We also expect ongoing FDI flows, and a potential renewal of sovereign buying, to provide further support. We are also positive on the outlook for NZD, as NZ commodity trends are favourable, and while employment indicators in NZ are mixed, the NZ housing sector continues to gain momentum.

### **Norway**

Norges Bank dilemma is setting policy in a way to deter capital inflows/currency appreciation AND prevent a further build-up of household debt. Although we are less than certain that Norges Bank actually will deliver a rate hike in Q2 in line with the Bank's current rate path, the focus will continue to be on hikes rather than cuts. Largely stable crude may limit the upside in the NOK somewhat, with the Norwegian unit already looking relatively expensive vs. oil, with the trade-weighted NOK up almost 5% on the year despite crude being largely flat YoY.

Longer-term fundamentals, meanwhile, remain very supportive, with Norway's budget and C/A surpluses the biggest among the G10 currencies, and with Norway one of a shrinking number of triple A rated developed markets with a stable outlook. Our base case is for EUR/NOK to continue to trend lower, targeting 7.10 by end-Q2 and 6.95 by end year.

So what are the factors/risks that could prevent a further NOK appreciation in 2013? As always given the financial infrastructure and the limited bond market, the lack of liquidity continues to be a hindrance. There is also the concern, shared by Norges Bank, about an asset bubble in the housing market.

### **Sweden**

We target 8.20 by end-Q2 for EUR/SEK and 8.00 by end year. While near-term, Riksbank pausing on rates will remove, at least temporarily, [the] one obstacle to continued appreciation, in particular in an environment where the global recovery is broadly intact and positioning generally light, the slightly more medium rationale for sustained SEK strength also remains valid. Even in a high volatility Eurozone crisis scenario, the SEK as the only AAA rated developed market currency consistently undervalued on longer-term valuation metrics such as PPP, BEER and FEER, should continue to perform.

## Asia

### China

We like shorting 1-year USD/CNH for three key reasons. First, it should capture appreciation in the USD/CNY fixing, which we expect will move lower by 3% in 2013 as policy makers respond to a rising inflation trajectory. Second, long CNH positions enjoy the highest vol-adjusted carry returns in the region, with tight liquidity in the offshore CNH market – which we expect will ease this year – having kept the deliverable forward curve elevated. Third, CNH spot gives us exposure to the possibility of band widening by the Chinese authorities in the next few months. Local media reports have raised speculation of greater yuan flexibility, and market pressure for wider bands has been demonstrated with spot having traded at both the +/-1% band-extremes in 2012.

### India

Underhedged exporters and option-related barriers could also accelerate downside USD/INR moves, with valuations and RBI intervention not a near-term constraint, in our view. While INR could enjoy a bout of inflow-related gains in Q1 ahead of the rate-cut cycle and a last reform wave, election populism and the weight of large twin deficits will make gains difficult to sustain. Our 3-month forecast is 53 and 12-month is 52.

### Indonesia

We continue to think the rupiah will underperform even in an environment where the broad USD comes under pressure. The trade account is likely to register wider deficits in coming months on rising investment-induced imports growth and flagging exports growth as external demand from China and G2 markets remains weak. Along with outflows in other CA components (i.e. MNC repatriation), this will continue to pose a challenge to tight onshore USD liquidity conditions. Concerns about future USD liquidity constraints should limit local exporters' willingness to convert USD receipts, while dampening foreign interest in local assets. Loose monetary policy amidst strong growth poses upside risks to inflation, staying bond inflow appetite. Thus, despite the IDR's appealing carry and retracement potential, we remain unconstructive on the currency's outlook.

### Korea

The tailwinds provided by recent credit rating upgrades and the G2 liquidity announcement have provided a push for strong portfolio inflows into Korea in recent weeks, helping USD/KRW trade back to its 2012 lows. However, we suspect FX gains will be more moderate from here. The shift in focus by Korean authorities back to growth has likely increased BoK's resistance to currency strength. Korea is also one of the most exposed in the region to the China slowdown, with over 20% of Korean exports bound for the Mainland. While we do see potential for some near-term upside in the KRW, gains will likely be checked by the central bank.

### Malaysia

The MYR satisfies many of the conditions for performance in a QE3 world, given its high beta to risk and the broader dollar, encouraging technicals, a less interventionist central bank, robust domestic growth which should support for equities, and attractive yield differentials. However, it is worth sounding some emerging notes of caution. If the recent sharp decline in palm oil prices extends, it could weigh on Malaysia's trade balance, with bio-fuels a large driver of the present surplus. Locals also remain active USD bidders with resident portfolio and FDI outflows continuing apace. The risk of a credit ratings downgrade has also been flagged as the government ramped up spending ahead of elections. We do think a positive external backdrop would provide the push for MYR to jump these fundamental hurdles, but domestic dynamics may be limiting if global risk underwhelms.

### Philippines

The peso is our favorite currency in Asia for 2013. We look for USDPHP to break below 40 in Q1 and reach 38.0 by year-end. It enjoys a solid current account position underpinned by stable remittances and BPO receipts, and a robust growth/structural reform story which continues to gather interest, and which should eventually invite a credit re-rating to investment grade. BSP

we think will struggle to counter FX strength. It has tried to reduce the attractiveness of the peso by cutting interest rates (policy and SDA), but with a booming economy and flush domestic liquidity, rates cannot be kept low for long. Attempts to depress FX carry (stopping rolling FX swaps onshore, and NDF position limits for banks) may serve to temper speculative interest but will not arrest fundamental flows. Direct intervention meanwhile will be challenged by pressure on BSP's balance sheet. While negative carry across the curve makes short USD/PHP NDF positions costlier, we believe spot gains will be rewarding. So we look to add on retracements higher in the NDF points.

### **Singapore**

Despite an assumed 2% appreciation bias to the SGD NEER, we look to trade SGD from the short side. With SGD NEER trading near the top end of the policy band, the risk-reward to shorts is asymmetric with scope for a fall of over 3.5% within the bands. While our base case is for the MAS to stick with its tightening bias in April, the risk of further tightening is small in our view. Inflation, while still above MAS' comfort zone this year, has begun to ease. Falling competitiveness stemming from large real appreciation of the SGD could also be becoming a concern, particularly with continued weakness in growth.

### **Taiwan**

USD/TWD turned lower ahead of QE3 announcements as under-hedged local assets managers stepped up FX hedges and equity flows returned. Although the QE3 announcement provided another powerful push lower, USD/TWD has consolidated. A deferred exports recovery and RMB depreciation weakened the fundamental case for the TWD. With inflation having spiked and little room to cut rates, CBC may be reluctant to tolerate further performance in the TWD.

### **Thailand**

The THB's positive correlation to gold has continued to reach new highs, as gold-related USD hedging flows spur THB gains on gold rallies. However, moves lower in USD/THB have been met with some resistance from BoT. Even though the domestic economy has bounced back well from the floods disruption, Thailand's exports forecasts have been downgraded due to weak external demand. We thus expect the government to favor a weaker baht to support exports, with BoT intervening to keep THB gains in check, in keeping with their long-standing policy of allowing the THB to move in line with regional FX.

## ***EMEA***

### **Czech Republic**

In the Czech Republic a large output gap and a restrictive fiscal plan mean it falls on monetary policy to provide support for the economy. Also, core CPI remains subdued, pipeline price pressures as well, dragging headline lower, and combined with the large output gap this would suggest the CNB will monitor the risk of further disinflation closely in the new year, in turn suggesting the risk of FX intervention will not go away. On balance, high export dependence, plenty of spare capacity and fiscal consolidation are all factors continuing to impede growth, underlining the need for monetary policy to remain or even become more expansionary, in turn undermining the appeal of the CZK. We remain short CZK vs. PLN.

### **Hungary**

We believe the upside will be capped in HUF, even in a more constructive risk environment. Given the prospects of an MPC entirely appointed by the government in 2013, further rate cuts are all but certain, and with headline inflation remaining relatively elevated mainly due to supply side factors (currently 5.2% YoY), this is likely to result in a gradual FX underperformance vs. the rest of the region. Indeed, history clearly shows that a sustained NBH rate cutting cycle at a time when the ECB largely is staying put has typically resulted in HUF underperformance (Mar'05-Jun'06, Jun'07-Feb'08, Mar'10-Jul'10). In addition to further rate cuts/negative real rates, the lack of an IMF loan deal is further restricting the appreciation potential in HUF. Indeed, even assuming a higher EUR/USD (DB sees 1.35 Q1), we see EUR/HUF remaining in a broad 275-305 range over the next 3-6 months, consistent with the trend/pattern over the past 10-11 years, which clearly shows HUF in a range until a more significant sell-off, after which the Hungarian unit always settles into a 'new and higher' range vs. the EUR.

## **Israel**

We remain constructive on ILS over the medium term. However, we also remain uncomfortable going long ILS at current levels, with the Bol continuing to reduce rates and with the Israeli unit expensive on our financial fair-value metrics after having gained 5-6% vs. the USD since mid-November (top performing EM currency). The constructive medium-term outlook for the shekel, meanwhile, is primarily justified on our expectation for the C/A balance to swing back into surplus (natural gas production from the Tamar field is slated to begin this year), but also on a belief that despite recent rate reductions, the Bol will maintain short-end real rates in positive territory, as well as some of the most attractive longer-term valuation across EM FX. On a pull-back to the 3.80-3.85, re-establish USD/ILS shorts. Ultimately we expect the move lower to extend to around 3.50.

## **Poland**

We remain constructive on PLN, despite the fact that the NBP has turned decidedly more dovish over the past month, having revised down GDP forecasts more than anticipated and with the CPI projection largely in line with the target over the policy horizon. However, we stick to the view that for PLN this will have very limited implications. This view is partly based on the fact that the rates market is already priced for an aggressive 125bp of further rate cuts over the next 12 months, not necessarily consistent with an economy with no real output gap and a central bank which continues to be focused on the real rates development.

## **Russia**

The constructive RUB story is largely intact. The NSD (National Settlement Depository) recently acquired the license enabling them to open nominal holder's accounts, meaning OFZs will be Euroclearable in the new year. To what extent this opens the door for significant inflows going forward is unclear however, as data on foreign OFZ holdings both from the CBR and our own calculations based on EPFR data, suggesting foreign ownership of less than 10%, only include direct ownership. This would be mis-leading since indirect ownership (TRS, CLN, etc) makes up a significant part of the market. How much higher the international market share really is, however, is not clear, but even if it is closer to 15% (our local desk's estimate), there is potential for at least \$10-15bn of inflows going forward.

Capital flows aside, RUB will also be supported by a central bank increasingly focused on inflation. The CBR has repeatedly in recent months reiterated its aim to continue moving towards inflation targeting. With inflation at 6.6% YoY running well above the CBR's 5-6% YoY target, rates will hence have to stay elevated. Finally, and apart from policy support and the prospect of stronger inflows, the RUB remains cheap compared with traditional drivers like crude, equity sentiment and CDS.

## **South Africa**

In USD/ZAR the prospect of some 'normalisation' in the mining industry, and a more supportive global risk environment, could see the risk sensitive ZAR returning to around 8.40, which we continue to believe will represent the new 'floor' in USD/ZAR. However, while labour unrest has abated over the past couple of weeks, the medium-term trend level of activity (investment) in the sector is likely to have been adversely affected. This suggests a continued structural deterioration in the external balances. To what extent this will be reflected in the ZAR vs the majors will depend on global risk sentiment, but deterioration in the external balances and the increasing likelihood of SARB policy easing are consistent with ZAR underperformance vs. peer currencies.

## **Turkey**

The Lira, where we find recent CBT rhetoric TRY supportive, as it implies 1) that policy going forward will be shaped to a greater extent by the inflation outlook, and 2) that currency appreciation will not pose a serious concern to the Bank until the REER exceeds 130 (currently 119.2). In addition to a monetary policy no longer entirely concerned about the growth outlook, the adjustment in the external balances has continued unabated, with exports outperforming imports despite the unfavourable external environment. Add to that the sovereign rating upgrade from FITCH, and the backdrop is much more supportive of the TRY, allowing the highest risk-adjusted carry in FX, attractive valuation and light positioning to underpin the Lira to a greater extent.

## *Latin America*

### **Brazil**

Rising commodity prices amid more supportive external demand and the consolidation of the current recovery on the back of the lagged effects of policy stimuli should support a rangebound BRL with risks biased to mild appreciation. The BRL still offers attractive carry but now coupled with lower volatility. EUR funding could provide additional upside.

### **Mexico**

A combination of US reflation and reforms, potentially leading to increased FDI and portfolio flows, should support further appreciation. The CAD becomes an attractive funding currency in this case due to the NAFTA participation and overvaluation. Mexico remains our top pick in LatAm.

### **Chile**

A tight labor market and growing imbalances in the current account and real estate market would maintain the central bank on guard. Additionally, rising commodity prices, and increased risk of intervention well below current level (perceived to be below 460) pave the way for further gains. We like buying CLP against EUR in particular.

### **Peru**

Strong domestic growth based on both public and private investment, amid a likely mining investment boom that could bring additional USD50bn over the next few years, should push the peso to more even stronger levels

### **Colombia**

Tax reforms passed at the end of the previous year will increase foreign investors' appetite for local assets. The authorities however may resort to additional measures to counteract appreciation forces in the currency when it is already trading at strong levels. We remain neutral.

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# FEER v. BEER: Battle of the valuation models

## When PPP is not enough

Value investing in currency land is not for the faint of heart – or for the impatient. Academic studies suggest the average half-life of **Purchasing Power Parity (PPP)** over/undervaluation is three years, e.g. 20% PPP overvaluation results in only 10% cumulative depreciation over three years. A valuation drag of several percentage points is not enough to give investors a substantial edge; increasingly, currency participants are relying on more sophisticated valuation models.

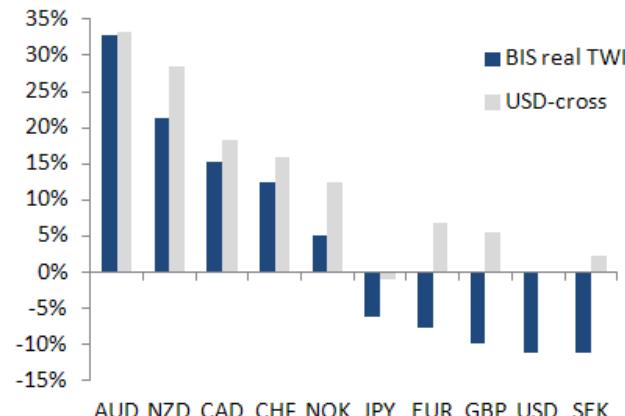
One such improvement, investigated in the 25-Feb-11 Exchange Rate Perspectives, is the **Behavioural Equilibrium Exchange Rate (BEER)** model. This approach builds off the academic work of McDonald and Dias (2007) that identifies productivity and terms-of-trade shocks as two potential sources of real exchange rate deviations (e.g., PPP over/under valuations).<sup>1</sup> In this paper we expand upon our previous work, calculating BEER valuations for 32 currencies using a streamlined framework that accommodates monthly updates from various countries.

Another variable related to real exchange movements is the current account. John Williamson (1983) pioneered the use of current accounts and output gaps in his **Fundamental Equilibrium Exchange Rate (FEER)** model.<sup>2</sup> The basic premise is that current accounts mean-revert to their long-run steady state values. This “underlying” level is not necessarily zero: some countries attract capital over time (United States) while others export capital, primarily through commodity driven surpluses (Norway, Saudi Arabia) or export-led development (Germany, Sweden, China). In the short run, both relative prices (exchange rates) and relative demand (output gaps) govern current account balances through the following channel:

Current account balance =

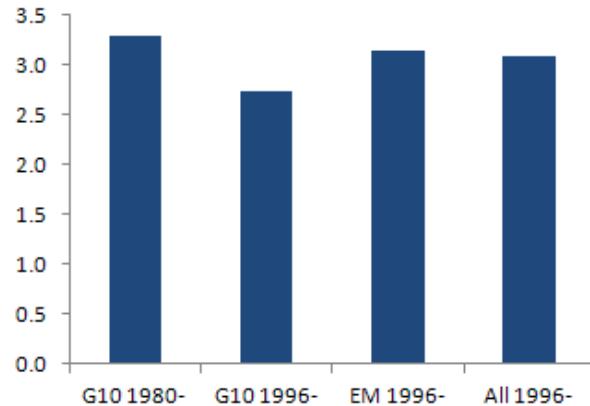
Underlying C/A + (Price Elasticity) \* (Real Exchange Rate)  
+ (Income Elasticity) \* (Relative Output Gap)

**Figure 1: Current PPP valuations**



Source: BIS, Bloomberg Finance LLP. Note: BIS real TWI divided by its average since 1980

**Figure 2: Half-life of REER deviations is roughly 3 years**



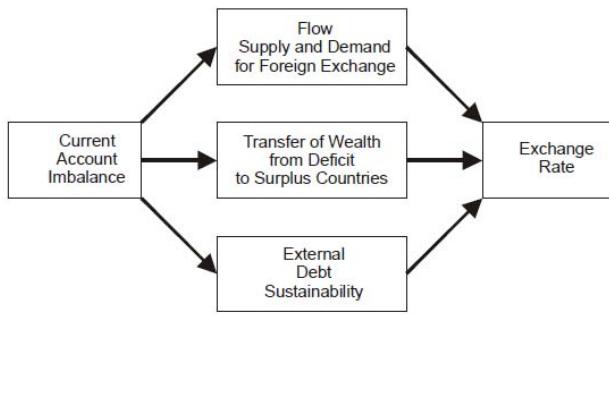
Source: BIS. Note: EM currencies are ARS, BRL, CLP, CNY, COP, CZK, HKD, HUF, INR, IDR, ILS, KRW, MYR, MXN, PHP, PLN, RUB, SGD, ZAR, TWD, THB, and TRY.

<sup>1</sup> MacDonald and Dias (2007) “Behavioural equilibrium exchange rate estimates and implied exchange rate adjustments for ten countries.” Prepared for the workshop on Global Imbalances, Peterson Institute of International Economics.

<sup>2</sup> Williamson, John (1983). *The Exchange Rate System*. Policy Analyses in International Economics 5. Washington: Institute for International Economics.

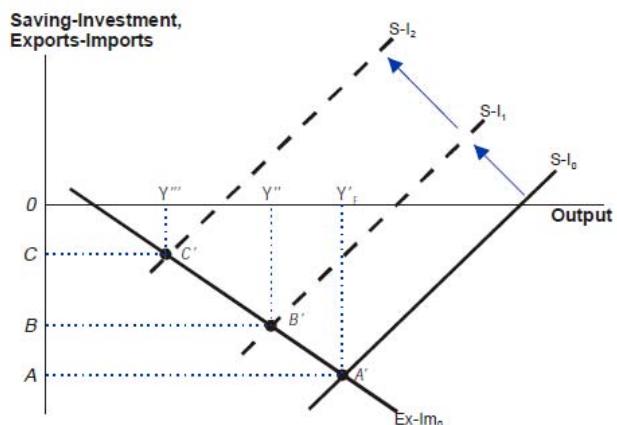
All things equal, we expect trade elasticity (both price and income) to be *negative*; that is, strong exchange rates and economic outperformance lead to current account *deterioration* (beyond the long-term underlying balance). In the former case, exports are more expensive in foreign countries and imports are cheaper at home; in the latter case, domestic demand for imports is stronger than foreign demand for exports. The premise behind the FEER model is that market forces will push exchange rates to their fundamental value which equates the current account to its underlying value in the long term. As a consequence, current account deficits (relative to the underlying C/A) will lead to depreciation in the long term and surplus will lead to appreciation.

**Figure 3: Current account imbalances and exchange rates – the channels of influence**



Source: Rosenberg (2002). "The Deutsche Bank Guide to Exchange Rate Determination", p77.

**Figure 4: Fiscal and monetary tightening both improve the C/A at the expense of output**



Source: Rosenberg (2002). "The Deutsche Bank Guide to Exchange Rate Determination", p82.

Our paper will compute both FEER and BEER historical valuations back to 1980 for the G10 and 1996 for 22 EM countries. These computations will help us pinpoint critical thresholds for current account reversals and valuation extremes both past and present. Going forward we will update PPP, FEER and BEER valuations on a monthly basis in the Exchange Rate Perspectives and other Deutsche Bank FX research publications.

Considerable work has been done on estimating trade elasticities by the IMF (2005)<sup>3</sup>, Bahmani-Oskooee and Kara (2002)<sup>4</sup> and William Cline (2008)<sup>5</sup>; our work averages these coefficients to produce current account equations tailored specifically for each currency (coefficient values can be found in the appendix).<sup>6</sup> We base our estimates off of BIS real TWIs and convert those values to USD-cross over/under valuations using Cline's symmetric matrix inversion method.

<sup>3</sup> Yi Wu (2005). "Growth, Expansion of Markets, and Income Elasticities in World Trade". IMF Working Paper WP/05/11, Table 1, p25.

<sup>4</sup> Bahmani-Oskooee, Moshen and Orhan Kara (2003). "Relative Responsiveness of Trade Flows to a Change in Prices and Exchange Rate". International Review of Applied Economics, Taylor and Francis Journals, vol. 17(3), p293-308, table 2.

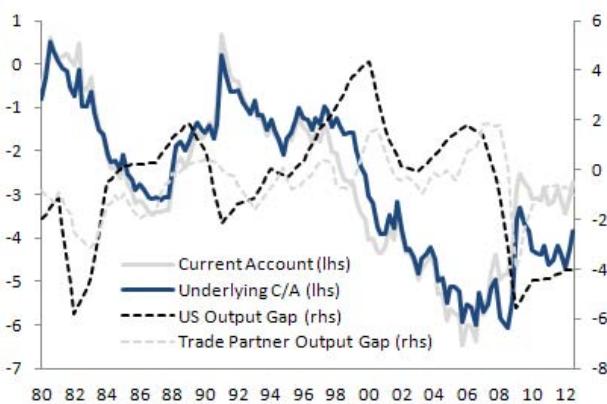
<sup>5</sup> Cline, William (2008). "Estimating Consistent Fundamental Equilibrium Exchange Rates". Working Paper Series WP08-6, Peterson Institute for International Economics, table 2 (base impact parameters).

<sup>6</sup> In practice we express current accounts and output gaps in % of GDP. For that reason, we multiply the income elasticity of imports and income elasticity of exports by imports / GDP and exports / GDP, respectively, to get income impact parameters. Cline (2008) similarly multiplies the export price elasticity by exports / GDP to get the price impact parameter and assumes the price elasticity of imports is zero as the price and volume effects of lower exchange rates completely offset. In other words, imports are assumed to precisely fulfil the Marshall-Lerner condition. Therefore our final equation is current account / GDP = underlying current account / GDP + income impact \* relative output gap + price impact \* real TWI, where income and price impacts are negative.

## FEER building blocks: current accounts and output gaps

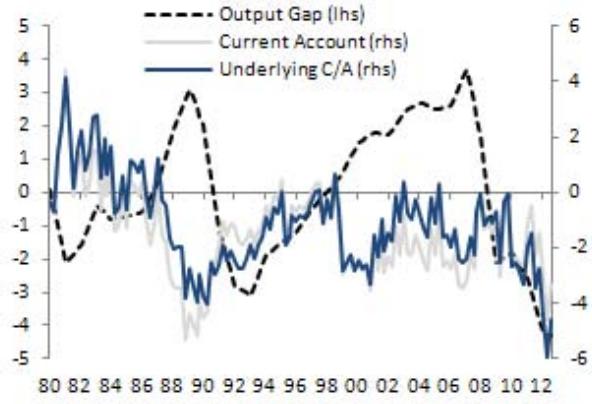
The basic premise of FEER is to find a “fair value” of the real exchange rate that equates to a “sustainable” level for the current account. In practice, this means computing an “underlying current account” which adjusts for output gaps, since all else equal, countries run C/A deficits when they grow faster than their trading partners. Earlier academic work assumed currencies would revert to a fair value that brought underlying current account balances into balance; later work has tended to relax this point, and have currencies move to a fair value that pushes underlying current accounts back to their long-term average.

**Figure 5: USD C/A worse than appears due to slowdown**



Source: IMF WEO, BEA, EcoWin, DB.

**Figure 6: UK C/A deficit also understated by over 1%**

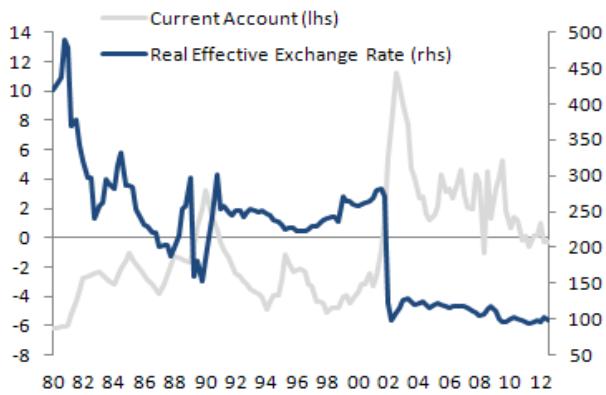


Source: BIS, EcoWin, DB.

Figures 5 and 6 demonstrate the influence of output gaps on the reported level of the current account. The US current account understated the “true” underlying C/A deficit when it briefly came into balance in 1991 as a result of US economic underperformance and it overstated the deficit in 2006 when the US outperformed. Currently the US is underperforming its trading partners (particularly in emerging markets) and so the underlying C/A deficit (4%) is worse than the headline deficit (3%). The dollar is fundamentally more expensive than it appears since the deficit will likely worsen when the US economy recovers.

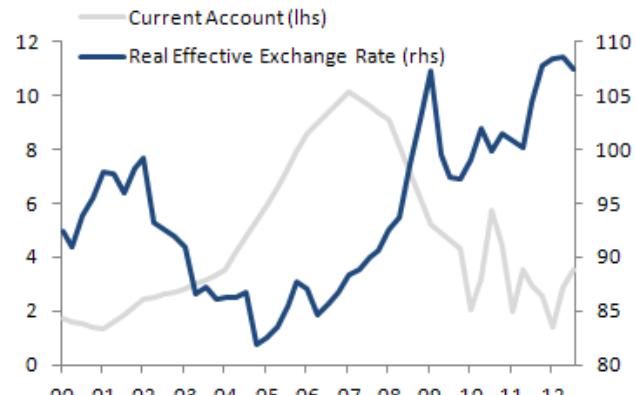
Figures 7 and 8 are a reminder of the power of current account / exchange rate dynamics. The Argentine peso has repeatedly sold off when deficits become unsustainable, most famously in 2001 when the currency board failed. The Chinese yuan is also under considerably less pressure since their current account surplus returned to sustainable (3%) levels. Indeed, they run deficits with almost all of their trading partners except the US.

**Figure 7: ARS C/A deficit breaks the currency board**



Source: BIS, EcoWin. 2010 REER = 100.

**Figure 8: Chinese surplus drives CNY appreciation**



Source: BIS, EcoWin. 2010 REER = 100.

## FEER estimation and relationship to future exchange rates

FEER models are very difficult to estimate well: they have many structural parameters (income and price elasticities), theoretical ambiguities (do we really expect Asian surpluses and US deficits to entirely disappear or just revert back to sustainable levels?) and inputs which themselves are difficult to estimate (output gaps, appropriate trade weights). In addition, FEER valuations often don't sum to zero – many currencies may be “overvalued” or “undervalued” by a reasonable FEER model in any given quarter. It is no wonder many practitioners are content to source Cline and Williamson FEER estimates (which impose sophisticated constraints to force global consistency) despite the limitations of the time series (yearly back to 2009).

Our aim is to produce quarterly estimates of FEER values and monthly estimates of FEER over/under valuations (using monthly spot values) back to 1980 for G10 currencies and 1996 for 22 emerging market currencies. We accept that over/under valuations will not always sum to zero and we source most inputs and structural parameter estimates from the IMF and academia in an attempt to minimize estimation errors (see Appendix for a complete list of data sources). In practice these limitations do not appear to harm the predictive value of our FEER model in any significant way.

### Do current accounts revert into balance or towards “sustainable” levels?

When the free float era began academics assumed current account balance was a natural equilibrium and exchange rates would swiftly correct any global imbalances. Bretton Woods was in fact ended by a German surplus and US deficit that breached 3%. At the time, this was considered an “unsustainable” imbalance and economists have referenced this figure ever since as a trigger for exchange rate led current account reversals.

But is this 3% standard really appropriate for the reality of 21<sup>st</sup> century trade? Trade as a percentage of world GDP has doubled from under 30% in 1971 to 55-60% today and international capital markets are far deeper in the floating rate era.<sup>7</sup> There are a number of countries, including but not limited to Germany, that comfortably run surpluses of 5% and higher without undue currency pressures (e.g. CHF, NOK, SGD). At the same time, reserve currencies (USD, GBP) and carry currencies (AUD, NZD) have successfully funded deficits above 3% for many years at a time – although the latter are subject to sudden and unpredictable sell-offs.

To a large extent global imbalances are driven by global factors; namely, the appetite of US investors for foreign assets and corresponding US current account deficit. Indeed, 40% of the variation in G10 current account balances can be explained by the first principle component which in turn is 93% correlated to the US current account. In Figure 9 we see the Swedish surplus has been 80% correlated to the US deficit since 1980.

### Advantages of employing current account reversion to long-term averages

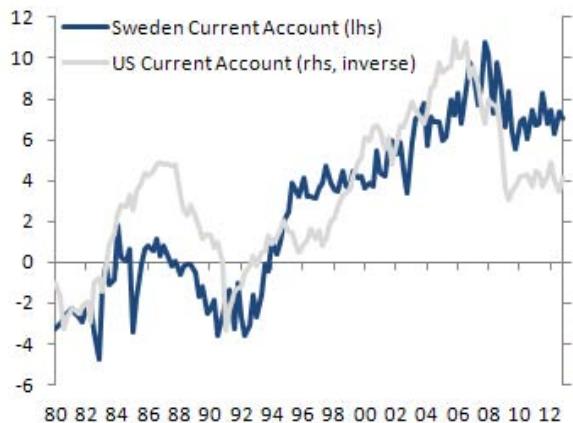
Thus the vision of real exchange rates driving current accounts into balance is an incomplete picture of the world. Rather, there seem to be chronic surplus (e.g. NOK, SEK, CHF, East Asia) and deficit (e.g. USD, GBP, AUD, NZD, CE3) countries which expand and contract their balances according to the rhythms of global trade, USD funding availability and risk appetite, in keeping with the Bretton Woods II framework.<sup>8</sup> No doubt individual countries also run surpluses and deficit due to internal factors (e.g. China and Turkey, respectively, in recent times) but any reasonable FEER model should, at the very least, allow for some persistence in global imbalances owing to the directional stability of international capital flows.

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<sup>7</sup> <http://www.tradingeconomics.com/world/trade-percent-of-gdp-wb-data.html>

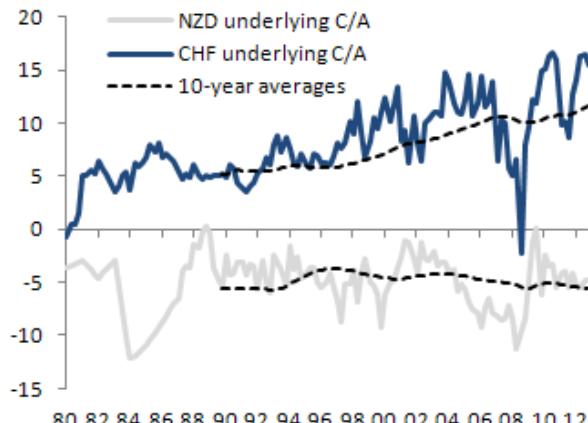
<sup>8</sup> Dooley, Michael P, David Folkerts-Landau and Peter M. Garber (2009). *Bretton Woods II Still Defines the International Monetary System*. NBER Working Paper No. 14731.

**Figure 9: To some extend all current accounts are driven by global USD funding factors**



Source: BIS, EcoWin, DB.

**Figure 10: Do current accounts necessarily return to balance? Or do they revert to the mean surplus/deficit?**



Source: BIS, EcoWin, DB.

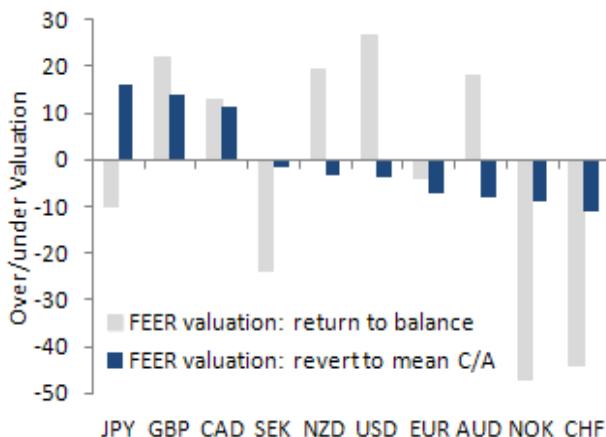
Cline and Williamson (2009) deal with this issue by calculating FEER values sufficient to drive C/A surpluses and deficits below 3% subject to the constraint that all nominal exchange rate change should sum to zero. The authors also adopt the IMF rule that these FEER values should not destabilize the ratio of net foreign assets to GDP. This framework is mathematically elegant but is difficult to reconcile with the stubborn persistence, even continued growth, of current account imbalances for countries such as Switzerland and New Zealand. Swiss productivity has been undeniably resilient to real CHF appreciation over the years, and while the Swiss non-tradable price level is noticeably high to tourists, Swiss companies seemingly have no problems competing abroad.

Our model takes a simpler approach by calculating FEER values which would force underlying current accounts back to their long-term (10-year) averages. This approach splits the difference between assuming total structural persistence of global imbalances (e.g. real exchange rates are always fairly valued) and total elimination of these imbalances (e.g. fair values bring every country into C/A balance). We thereby acknowledge the possibility of structural C/A imbalances but don't allow these imbalances to grow indefinitely by forcing them back to their long-term averages. Our FEER estimation technique can be summarized as follows:

1. Estimate the underlying C/A for each currency by adjusting the nominal C/A balance for the domestic output gap, trade weighed foreign output gap, and their associated trade elasticity of income (sourced from academic work)
2. Calculate the real effective exchange rate adjustment necessary to force the underlying C/A back to its 10-year trailing average (as opposed to complete balance) using the price elasticity of income (again sourced from academic work).

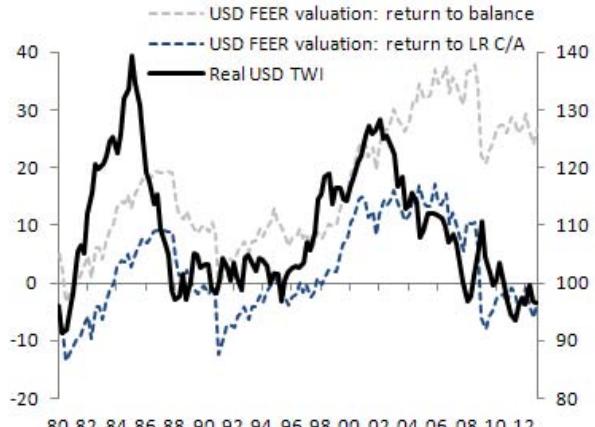
Figure 11 illustrates the considerable differences in FEER estimates when using reversion to long-run C/A averages versus full return to C/A balances. Using Cline and Williamson's price impact parameters we estimate NOK and CHF would need to appreciate over 40% in real terms to completely eliminate their double digit C/A surpluses; note that headline C/A figures actually *understate* the extent of their underlying surpluses since both economies are outperforming their trading partners! After accounting for these structural surpluses we find that, while NOK and CHF are still the most undervalued G10 currencies relative to FEERs, the extent of their undervaluation shrinks to 9% and 11% on a trade weighted basis, respectively. One must accept that SEK is currently at fair value in this framework since the Swedish underlying surplus is no greater than it has been over the past ten years. Moreover, the Japanese yen looks quite overvalued as its trade balance sharply deteriorates despite retaining a (small) C/A surplus in absolute terms for the time being.

**Figure 11 FEER values obtained using C/A divergences from structural averages differ significantly from FEER estimates that assume a full return to C/A balance**



Source: BIS, EcoWin, DB.

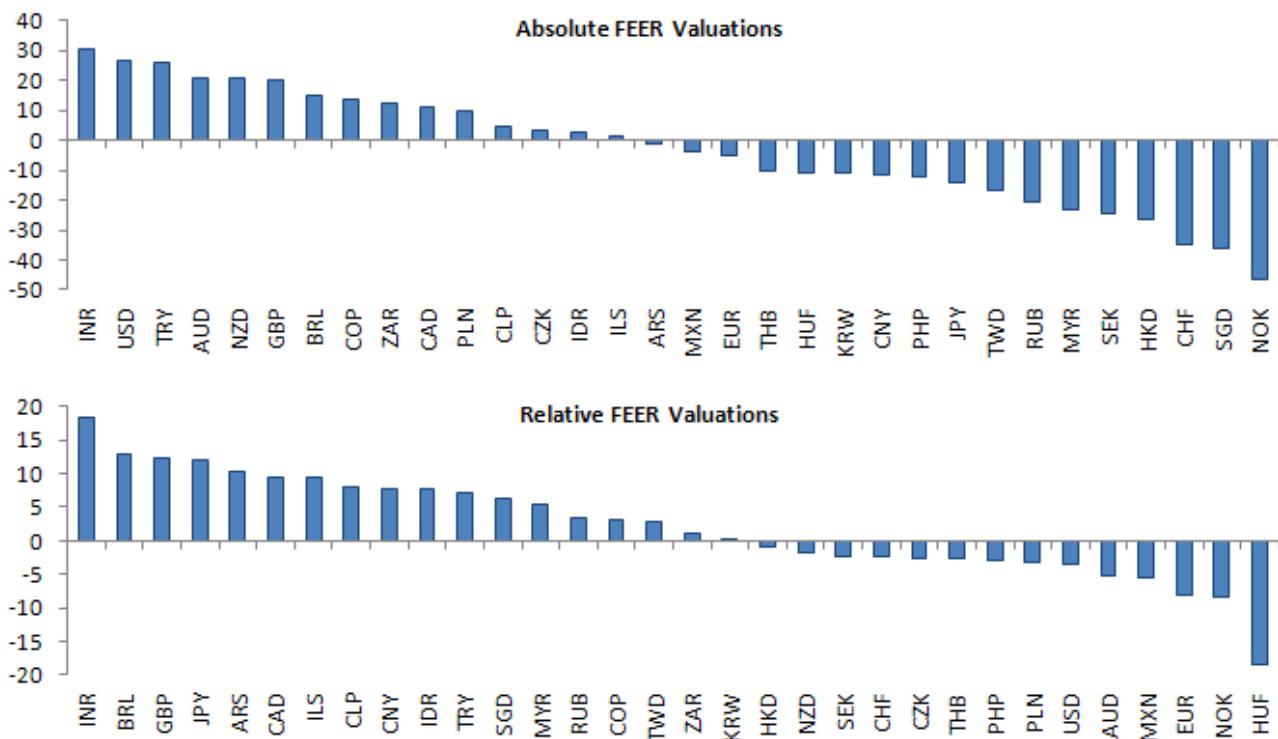
**Figure 12: Allowances for structural imbalances greatly enhance the stability and predictive power of FEER estimates**



Source: BIS, EcoWin, DB.

On the other side of the ledger, the UK and Canada's deficits are significant in both absolute and relative terms making GBP and CAD roughly 10% overvalued. Yet the 4% US underlying deficit is roughly at the historical average so the dollar is approximately fair value on our model. Again, this may appear wrong at first glance: hasn't the United States run a current account deficit (with few exceptions) since the early 1980s? On the other hand, this is precisely the point: if the dollar has been persistently undervalued for 30 years, what use is the FEER model anyhow? By that logic our assumptions make more sense, although both absolute and relative C/A numbers should be viewed in tandem for the proper context.

**Figure 13: Current (Q4 2012) absolute and relative FEER valuations; USD is cheap relative to its structural C/A deficit.**



Source: Deutsche Bank, EcoWin, BIS.

## Revisiting the BEER model: do we treat all currencies the same?

Before we empirically evaluate the FEER model we say a few words about its valuation cousin, the Behavioral Equilibrium Exchange Rate (BEER) model.

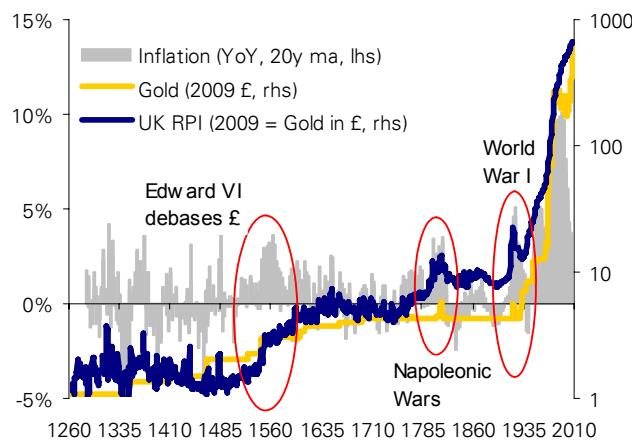
### Our starting point: Purchasing Power Parity

Financial economists in particular have long been flummoxed by the failure of fundamental models to adequately explain medium-horizon foreign exchange movements.<sup>9</sup> In particular, the law of one price (LOOP), which holds that price levels should be roughly equivalent in developed countries, drives the Purchasing Power Parity (PPP) theory underlying our valuation index, namely that exchange rates should mean-revert to fair-value as dictated by LOOP. PPP deviations seem to persist for years, and exchange rates are far more volatile than fundamental factors such as inflation differentials or Balassa-Samuelson effects, frustrating academics and practitioners alike.

We have over thirty years of data on fully-convertible floating exchange rates in the G10, but this may not be enough to convince skeptical readers of the existence of currency valuation. Fortunately, we have 750 years of data!

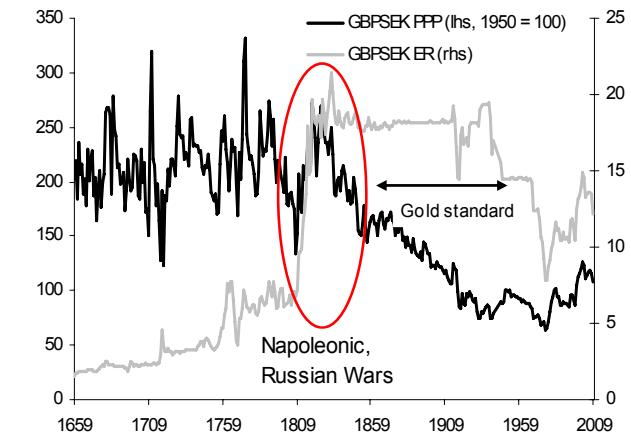
When viewed over long-term horizons, the case for a valuation framework based upon PPP strengthens considerably. We see that the London official gold price is actually co-integrated with a back-filled UK retail price index (RPI) since 1260 – gold buys roughly the same amount of basic foodstuffs, and is bought for roughly the same annual wages, as it was in the middle ages.<sup>10</sup> But the pound sterling has steadily deteriorated when measured in fine gold, in-line with RPI inflation. GBP has gone through several noteworthy debasements, most dramatically during the reign of Edward VI in the mid-1500s, in the aftermath of the Napoleonic and World Wars, and during the worldwide inflation of the 1970s. Strikingly, GBP/USD has floated within a 40% valuation band around the current OECD fair value of 1.60 since American independence. This is true despite the fact that GBP/USD has declined in nominal terms from nearly 5.00 during the gold standard to roughly 1.60 today.

**Figure 14: Gold holds value during currency debasement; the gold price is co-integrated with UK RPI since 1260!**



Source: Deutsche Bank, Lawrence H. Officer, "The Price of Gold, 1257-2008", Measuring Worth, 2009.

**Figure 15: GBP/SEK rises with PPP fair value in Russian War; suffers real depreciation during gold standard**



Source: Deutsche Bank, Riksbank, Measuring Worth. Note: Grey line is nominal GBP/SEK, Black line is real GBP/SEK. Riksdalers used for krona prior to 1804. Military expenditure in the 1785-1810 period was likely spent on both the Russian War and Napoleonic War.

<sup>9</sup> For a classic paper on this topic, see Meese and Rogoff (1983), *Empirical Exchange Rate Models of the Seventies: Do They Fit Out of Sample?*. Journal of International Economics, 14: 3-24.

<sup>10</sup> For more detail on U.K. and U.S. prices and exchange rates, see Lawrence H. Officer's [www.measuringworth.com](http://www.measuringworth.com)

### Choosing relative over absolute PPP

Our historical analysis conflates two related concepts of PPP. In its *absolute* form, PPP dictates that price levels (i.e., cost-of-living) converge across G10 countries over time, so that the proverbial “cup of coffee” (or in the Economist’s version, a Big Mac) costs the same in common currency terms across all countries. By contrast, *relative* PPP states that inflation differentials drive nominal currency movements over 2-5 year time horizons, so that whatever the initial starting point in price levels across countries, these cost-of-living gaps do not widen over time in common currency terms. Over decades, productivity differentials (i.e. the so-called “Balassa-Samuelson effect”) come into play, causing faster growing countries to appreciate in real terms (net of inflation differentials) and generally causing cost-of-living gaps to narrow. Thus both versions of PPP are consistent with each other over the very long-term.

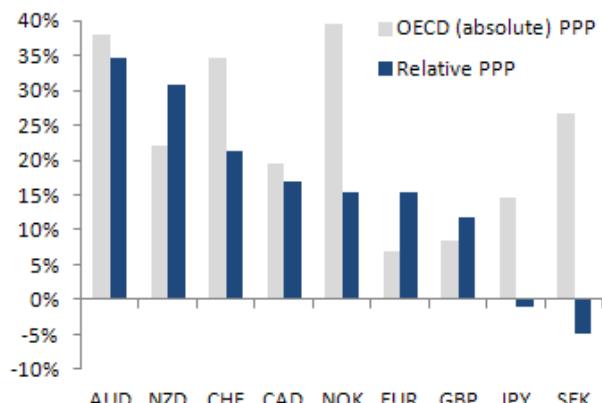
Relative PPP substitutes absolute price levels (which are difficult to arbitrage in practice) with a long-term average of inflation-adjusted spot rates. The deviation of the current inflation-adjusted spot rate from its long-term average is judged to be the over/undervaluation of the currency pair. This approach has several merits: first, the structural cost-of-living gap is ignored; second, relative PPP is much more stable and mean-reverting. A comparison of current relative and absolute PPP under/overvaluations for USD-crosses demonstrates more believable values for relative PPP (graph, left). While SEK is almost always expensive on an absolute PPP basis, it is (more reasonably) undervalued by 5% on a relative PPP basis.

### Moving from relative PPP to BEER

Real exchange rate deviations can be partially explained by endogenous factors, i.e. variables that are themselves influenced by exchange rates. Two such variables are the following:

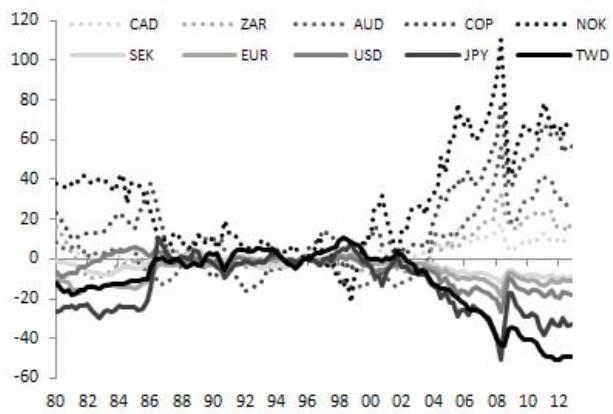
- 1. Terms-of-trade and “commodity currencies”.** Stockton (1980) was the first to recognize that in a world where goods are imperfect substitutes across countries, the real exchange rate should be influenced by the terms-of-trade. Within the G10, terms-of-trade correlations break countries into two buckets: commodity exports that benefit from rising commodity prices (AUD, CAD, NZD, NOK, most of LatAm), and commodity imports whose terms-of-trade fall with rising prices (principally JPY, EUR, USD, SEK, CE3, most of Asia). There are some distinctions between goods – CAD and NOK are most sensitive to oil prices, while AUD reacts to industrial metals and NZD (even USD) track food prices. These considerations become important when considering cross-rates such as AUD/NZD or AUD/CAD which are broadly neutral to commodities and global economy risk.

**Figure 16: Measures of absolute and relative PPP can vary significantly; relative PPP is more predictive**



Source: Bloomberg Finance LLP, OECD.

**Figure 17: Terms-of-trade indices are highly correlated across countries but vary considerably in intensity**



Source: Bloomberg Finance LLP (Citibank TOT), IMF, EcoWin.

But for the most part broad price swings across the commodities complex determine major terms-of-trade movements. Terms-of-trade levels are approximately 80% correlated between AUD and either CAD, NOK, COP and ZAR over the past 30 years, and -80% correlated between AUD and either SEK, EUR, USD, JPY and TWD, to name just a few. Generally, when commodity prices move, commodity exporters appreciate relative to commodity importers (albeit at varying intensities) and relative commodity prices are very a secondary consideration.

2. **Productivity Differentials.** The “Balassa-Samuelson effect” states that high levels of productivity drive up wages in the tradable goods sector of a country, which then spill over into higher wages in the non-tradable (services) sector through labor market arbitrage. Thus non-tradable good are more expensive in highly productive countries (in common currency terms), which shows up as real exchange rate appreciation when currencies are aligned with per capita GDP growth (acting as a proxy for productivity growth).

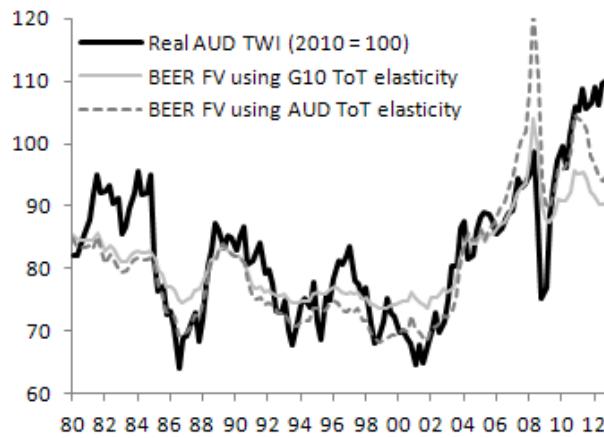
#### BEER Model Methodology

Following MacDonald and Dias (2007) we estimate behavioral equilibrium exchange rates in a cointegration framework where exchange rate levels are influenced by variables with medium-run (interest rates) and long-run (inflation, terms-of-trade, productivity) influences:<sup>11</sup>

$$\text{Real Exchange Rate} = \alpha + \delta_1 * \text{terms-of-trade} + \delta_2 * \text{productivity} + \mu \quad [\log \text{values}]$$

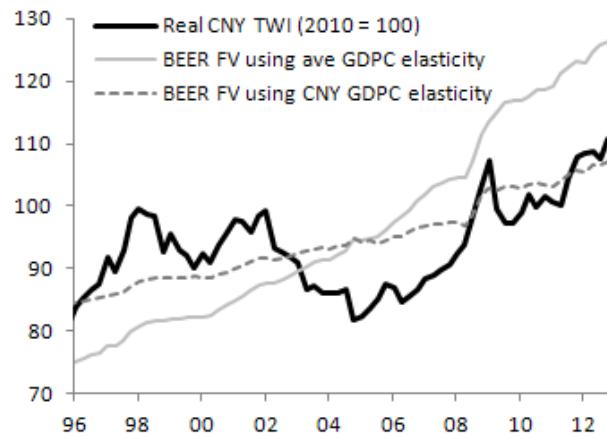
There is very strong panel cointegration in the 32 currency pooled dataset over 1996-2012 and some TWIs are individually cointegrated with terms-of-trade and per capita GDP. The dilemma we face is the following: should we estimate the sensitivity of each currency individually to ToT and GDPC, or should we estimate these elasticities jointly using pooled data? Figures 18 and 19 illustrate the temptation of using currency-specific coefficients (as we did in earlier BEER models): the real AUD TWI historically appreciates 0.8% for every 1% increase in AUD ToT, more than the 0.5% average G10 ToT elasticity; similarly, the real CNY TWI is only half as sensitive (0.25% vs. 0.5%) as the other 31 currencies to 1% real per capita GDP outperformance, perhaps in part due to official exchange rate management.

**Figure 18: The AUD dilemma: should we use pooled or currency specific terms-of-trade elasticities?**



Source: Deutsche Bank, EcoWin.

**Figure 19: The pooled vs. currency specific coefficient dilemma applies to CNY and Balassa-Samuelson effects**



Source: Deutsche Bank, EcoWin.

<sup>11</sup> MacDonald and Dias (2007) “Behavioral equilibrium exchange rate estimates and implied exchange rate adjustments for ten countries.” Prepared for the workshop on Global Imbalances, Peterson Institute of International Economics.

There is unavoidably room for discretion on whether to use pooled or currency-specific ToT and GDPC elasticities and an arbitrary element to the lookback window; e.g., what could we have known about these coefficients when computing valuations in the past and how have they changed over time? There is also some ambiguity on fixing the “long run” average of the real exchange rate – a problem encountered in traditional PPP analysis. Should we measure REER deviations relative to the entire data history (1980 for G10, 1994 for some EM) or use shorter trailing averages in recognition that structural breaks sometimes occur, such as Latin American hyperinflation and the Argentine currency board failure? In figure we can see that the Argentina peso TWI looks reasonably close to fair value when measured against a 10-year trailing average but not against longer averaged because of the massive currency board devaluation. This phenomenon is obviously exaggerated in the case of ARS but illustrates the difficulty of pinning down fair value levels.

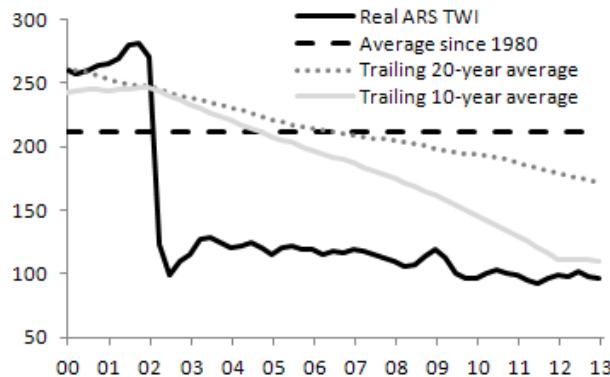
We ultimately chose to use pooled coefficients since there is less potential for parameter mis-specification. Our estimates suggest the elasticity of productivity is fairly constant through time and across currencies at 50%; in other words, 1% per capita GDP growth in excess of trading partner GDPC leads to 0.5% real effective exchange rate appreciation. Terms-of-trade elasticity is allowed to vary across groups; the “commodity currencies” are estimated to have ToT elasticity of 75% while the rest of G10 averages 50% and EM as a whole averages 20% (labeled  $\beta_{TOT}$  elasticities). We compute BEER over/under valuation as the following:

$$\text{BEER valuation} = \log (\text{real TWI} / \text{average real TWI}) - \beta_{TOT} * \log (\text{ToT} / \text{average ToT}) - 50\% * \log (\text{GDPC} / \text{average GDPC}) + 50\% * \log (\text{trade partner GDPC} / \text{average trade partner GDPC})$$

Long-term averages of terms-of-trade and per capita GDP are computed from 1996-2012. Real TWI long-term averages are computed from 1980-2012 for the G10, 2002-2012 for EM.

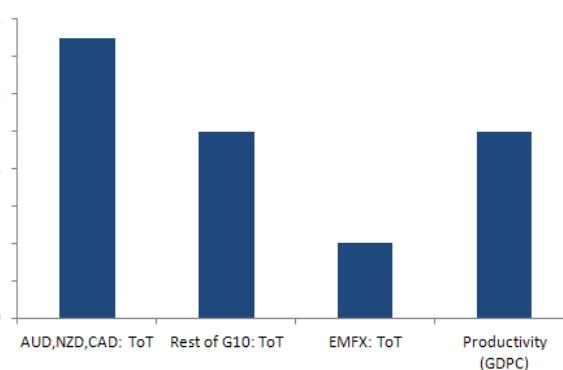
One difference from our previous BEER model<sup>12</sup> is the decision to exclude short-term rates from the valuation framework. Academic debate is split on this issue but it is generally thought that rate levels govern the short-term dynamics of real exchange rates rather than the long-run relationship since ultimately the level of rates should be reflected in inflation levels. In other words, for PPP to hold in the long-run, real exchange rate levels should be invariant to long-run nominal rate differentials should eventually translate to inflation differentials, leaving real rates (and real exchange rates) constant; however, in the short-run nominal rates may cause real appreciation/depreciation and hence be included in the dynamics of a VECM.

**Figure 20: The ambiguous PPP “long run” average**



Source: Deutsche Bank, EcoWin.

**Figure 21: ToT and GDPC elasticity used in our analysis**



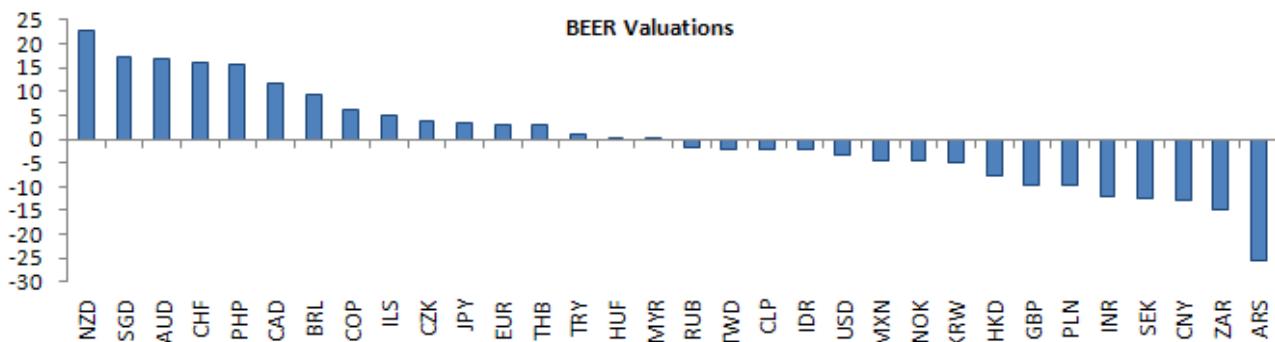
Source: Deutsche Bank, EcoWin.

<sup>12</sup> 25-Feb-11 Exchange Rate Perspectives. Determining G10 Equilibrium Values.

## Tying it all together

Our BEER valuations yield few surprises: neither NZD terms-of trade (surprisingly tame during the decade-long commodity boom) nor SGD productivity (unremarkable relative to Asian trading partners) can explain 25% real appreciations over the past decade, leaving these two currencies the world's most overvalued in a BEER framework. The Australian dollar was not especially expensive to begin 2012 but has since appreciated 4% in real terms while its terms-of-trade have fallen despite the recovery of iron ore prices. Using pooled instead of AUD-specific ToT elasticity (75% vs. 115%) accounts for most of the rest of the discrepancy (roughly 8%) between our new BEER valuation for AUD and the older version we have been reporting in the ERP; the absence of rate differentials accounts for another 2-3%.

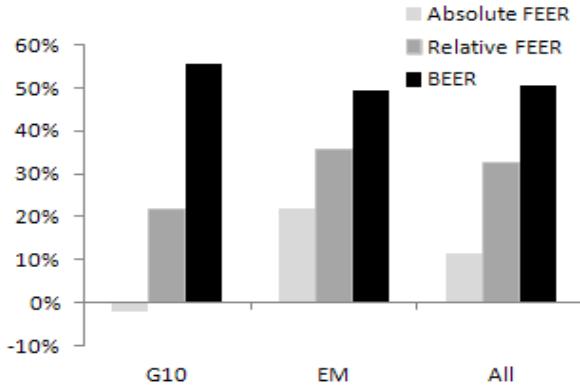
**Figure 22: Current (Q4 2012) BEER valuations**



Source: Deutsche Bank, EcoWin, BIS.

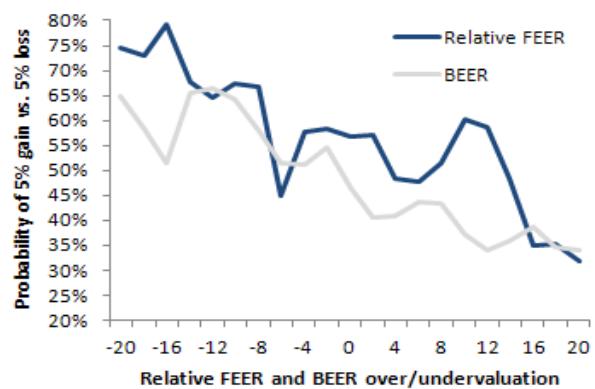
On the cheap side, the recent sell-off leaves ZAR 6% below its 10-year real TWI average even though ZAR terms-of-trade have risen 20% in the past 10 years and the South African economy has outperformed its trading partners. CNY is still cheap when accounting for China's outsize productivity, although not as inexpensive as many would think considering the substantial (25%) real appreciation in recent years. SEK and GBP stand out as cheap while USD is near fair value once declining productivity and ToT are taken into consideration.

**Figure 23: 50% of BEER over/under valuations (relative to REER) are erased in 5 years; relative FEER is 3x more effective than absolute FEER but 2/3<sup>rd</sup> as strong as BEER**



Source: Deutsche Bank, EcoWin.

**Figure 24: There is scant evidence of valuation “tipping points” as the proportion of 5% or more gains relative to 5% or more losses declines linearly with valuation**



Source: Deutsche Bank, EcoWin.

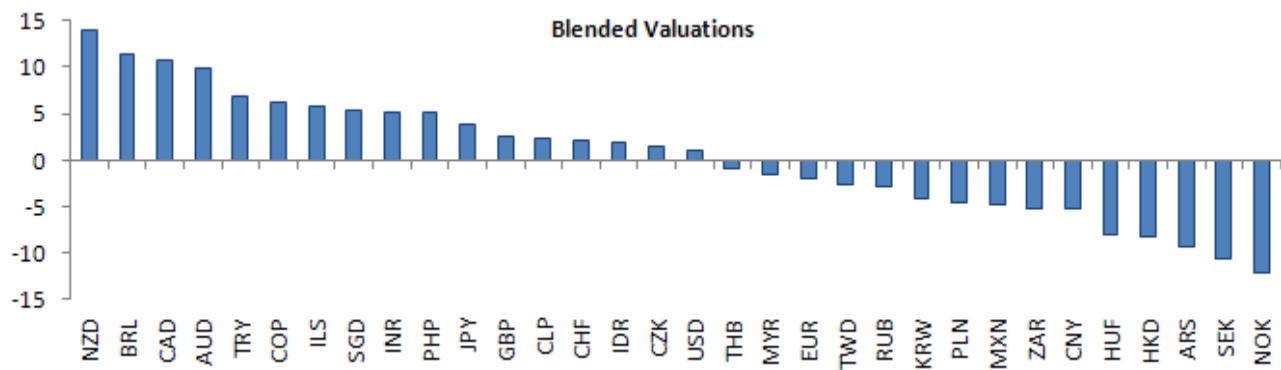
Since FEER is properly out-of-sample (aside from quasi-backward looking knowledge of trade elasticities) we should compare the predictive power of BEER to FEER on an out-of-sample basis as well. For that reason we use ten-year rolling long-term averages for real TWI, terms-of-trade and per capita GDP to evaluate out-of-sample BEER productivity. In Figure 23 we see

that 50% of BEER over/undervaluation is erased in 5 years while only 15% and 35% of absolute and relative FEER valuations disappear in five years, respectively. Although a half life of 5 years on BEER valuations might seem disappointing at first, we should note that when academics claim that the half life of PPP valuations are 3-5 years, they are calculating in-sample parameters, which makes a huge difference. Given limited data history for EM currencies we are quite satisfied that 5 year out-of-sample half lives can be put to good use.

Figure 24 plots the historical occurrence of > 5% real TWI gains (as a ratio to <-5% real TWI losses) over 5 years given relative FEER and BEER valuations between -20% and 20%. We can see 20% over/under valuations on either metric lead to reversals about 2/3<sup>rd</sup> of the time, a respectable long-run hit ratio. There is no evidence of a valuation threshold or "tipping point" which triggers these reversals since the hit ratios seem to decline in a linear fashion.

Going forward, we will provide all three valuations (absolute and relative FEER plus BEER) on a monthly basis as FX and ToT values are updated (although other fundamental values such as per capita GDP, inflation and C/A will only properly update mid-quarter and be carried over from previous quarters as needed). We will also compute a "blended valuation" which is comprised of 15% absolute FEER, 35% relative FEER and 50% BEER in keeping with the findings of Figure 23. Indeed, this blended framework is more predictive of future real exchange rate movements than any individual valuation framework in isolation.

**Figure 25: Current (Q4 2012) blended valuations (15% absolute FEER, 35% relative FEER, 50% BEER)**



Source: Deutsche Bank, EcoWin, BIS.

On this metric the G10 "commodity currencies" once again appear most overvalued, both because terms-of-trade movements do not explain all of their current popularity (even given generous ToT elasticities) and because all three countries feature substantial (and growing) underlying current account deficits. Brazil is similar in this regard despite the recent USD/BRL rally above 2 as the Brazilian C/A tipped from surplus to deficit since the crisis.

On the inexpensive side Scandinavia is an obvious winner due to sound balance sheets and (in the case of Norway) the decade-long bull market in oil. Some high productivity Asian countries with managed currencies have not yet erased their undervaluation (e.g. CNY, HKD and KRW) although China has come a long way.

Finally, we must admit that some currencies such as RUB (and perhaps all oil exporters) might be unknowable, as the 50% real appreciation since 2002 (following crashes in 1992 and 1998) sits uneasily against a 5% current account surplus and 80% terms-of-trade appreciation. We must remember that valuation models are ever imprecise and difficult to specify, but in the unpredictable FX world, they may be the only reliable guideposts we have.

**Daniel Brehon**, New York, +1 212 250 7639

*Special thanks to **Priyabratha Ratha** of Infosys for his tireless efforts as he helped me compile and analyze these valuation models.*

## Data Appendix

We blend income elasticity estimates from the IMF (Yi Wu 2005) and Bahmani-Oskooee and Kara (BOK 2002). Output gap impact parameters are calculated by multiplying these elasticities by trade shares. Some countries do not have available elasticity estimates; we use regional averages in their place. Price impact parameters are taken from Cline (2008).

	<b>Income Elasticity of Exports</b>		<b>Income Elasticity of Imports</b>		<i>IEE</i>	<i>IEI</i>	<i>Price Impact</i>
	<i>Yi Wu 2005</i>	<i>B-O K 2002</i>	<i>Yi Wu 2005</i>	<i>B-O K 2002</i>			
<b>AUD</b>	1.19	2.13	1.10	1.77	1.66	1.44	-0.17
<b>CAD</b>	2.09	0.21	1.61	2.45	1.15	2.03	-0.32
<b>EUR</b>	2.25	1.15	1.66	1.08	1.70	1.37	-0.14
<b>JPY</b>	1.94	0.45	1.06	0.14	1.20	0.60	-0.12
<b>NZD</b>	1.2	1.25	1.56	1.74	1.23	1.65	-0.25
<b>NOK</b>	2.62	2.37	0.67	0.29	2.50	0.48	-0.37
<b>SEK</b>	1.58	1.88	1.62	0.56	1.73	1.09	-0.36
<b>CHF</b>	1.47	2.54	0.93	3.75	2.01	2.34	-0.35
<b>GBP</b>	1.45	1.46	1.78	1.25	1.46	1.52	-0.23
<b>USD</b>	1.56	2.73	2.21	2.10	2.15	2.16	-0.16
<b>ARS</b>					1.54	1.12	-0.23
<b>BRL</b>	1.89		1.13		1.89	1.13	-0.16
<b>CLP</b>					1.54	1.12	-0.31
<b>CNY</b>					1.96	1.43	-0.30
<b>COP</b>	1.71	0.66	1.14	1.08	1.19	1.11	-0.20
<b>CZK</b>					1.53	1.14	-0.48
<b>HKD</b>	3.16		1.15		3.16	1.15	-0.75*
<b>HUF</b>					1.53	1.14	-0.48
<b>INR</b>	1.06		1.25		1.06	1.25	-0.14
<b>IDR</b>					1.96	1.43	-0.27
<b>ILS</b>	2.31	2.09	0.86	1.17	2.20	1.02	-0.32
<b>KRW</b>	3.77	3.00	1.68	1.62	3.39	1.65	-0.32
<b>MYR</b>					1.96	1.43	-0.50
<b>MXN</b>					1.54	1.12	-0.25
<b>PHP</b>	0.81	0.85	1.54	3.27	0.83	2.41	-0.38
<b>PLN</b>		1.10		0.73	1.10	0.73	-0.34
<b>RUB</b>					1.53	1.14	-0.30
<b>SGD</b>		0.85		0.84	0.85	0.84	-0.75*
<b>ZAR</b>					1.53	1.14	-0.36
<b>TWD</b>					1.96	1.43	-0.43
<b>THB</b>	2.5		1.29		2.50	1.29	-0.45
<b>TRY</b>		1.29		1.67	1.29	1.67	-0.27
<b>LatAm</b>					<b>1.54</b>	<b>1.12</b>	
<b>EMEA</b>					<b>1.53</b>	<b>1.14</b>	
<b>Asia</b>					<b>1.96</b>	<b>1.43</b>	

### Data

- Real and Nominal TWI, Trade Weights
- Terms of Trade
- Population, Output Gaps
- Current accounts
- Real and nominal GDP

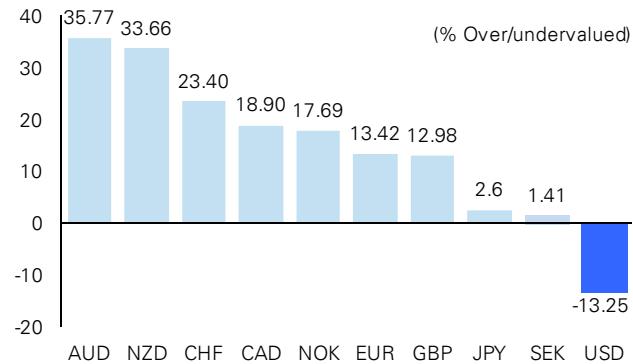
### Sources

- BIS, JP Morgan REER (pre-1994 EM)
- Citibank, World Bank WDI, OECD
- IMF WEO
- National Sources, IMF WEO, World Bank
- National Sources, IMF WEO, OECD

\* HKD and SGD price impacts are -0.50 in Cline (2008); we scale to reflect higher trade/GDP.

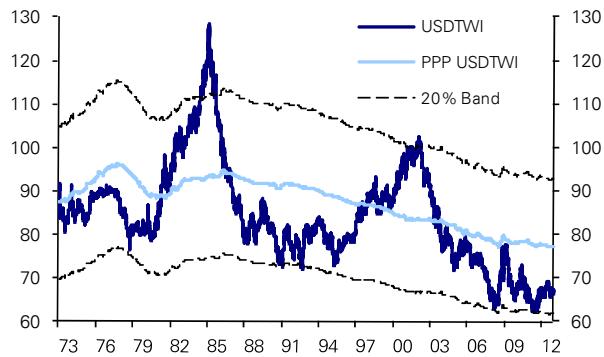
## G10 FX Valuation Monitor: Lines in the Sand\*

**Figure 1: The euro is expensive and the dollar cheap**



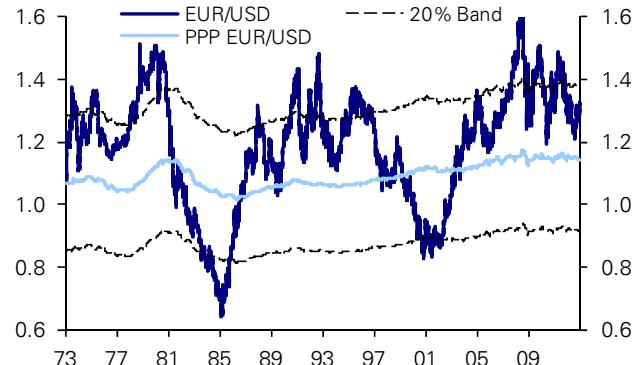
Source: DB FX Research

**Figure 2: The dollar is 12% cheap to fair value**



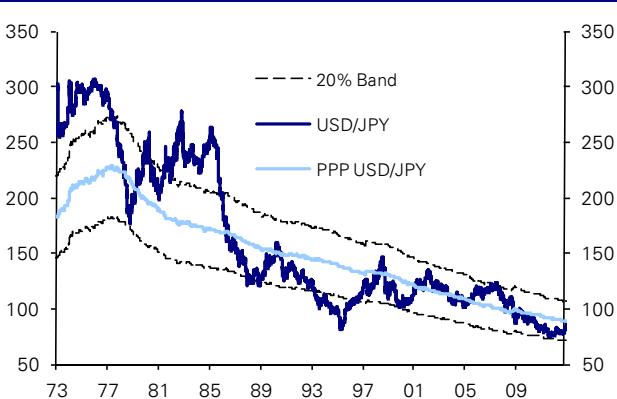
Source: DB FX Research

**Figure 3: EUR/USD: The euro is expensive though remains within the 20% threshold ...**



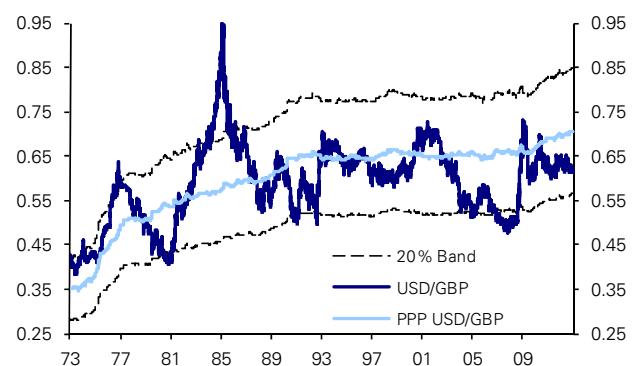
Source: DB FX Research

**Figure 4: USD/JPY: ...The yen is expensive**



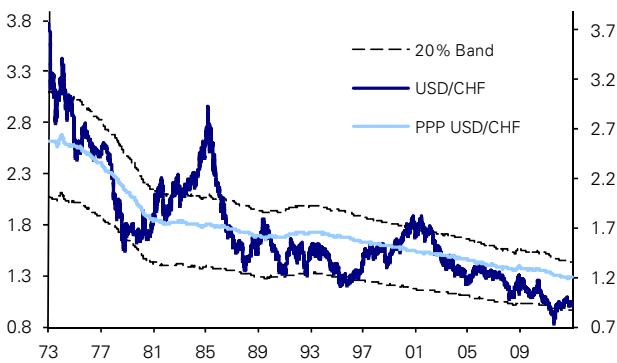
Source: DB FX Research

**Figure 5: USD/GBP: as well as sterling ...**



Source: DB FX Research

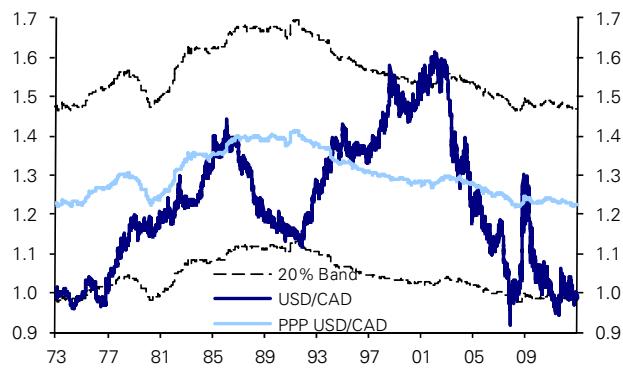
**Figure 6: USD/CHF: CHF is expensive**



Source: DB FX Research

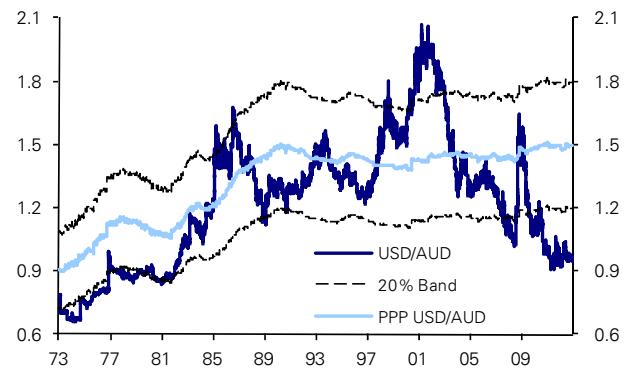
\*Our measure of relative PPP is calculated using long-term averages from Jan-80 to Dec-04 and deflating by monthly CPI differentials. We refer to current spot rates as "cheap" or "expensive" with explicit reference to this measure of fair valuation; these statements are not intended in any way to be "buy" or "sell" recommendations.

**Figure 7: USD/CAD: CAD overvaluation is being unwound**



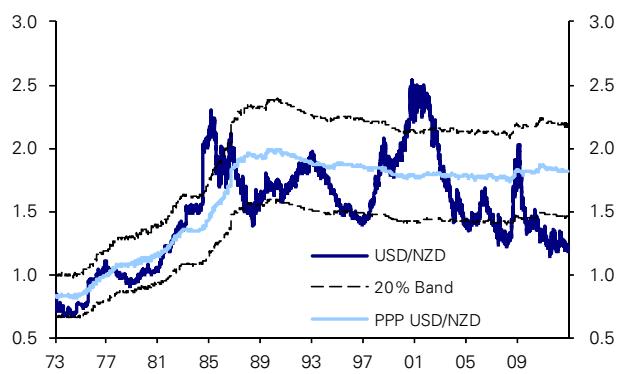
Source: DB FX Research

**Figure 8: USD/AUD: AUD is very expensive, beyond 20% threshold**



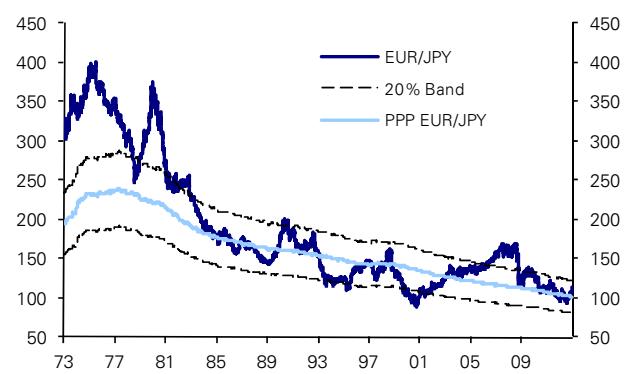
Source: DB FX Research

**Figure 9: USD/NZD: .and so is NZD**



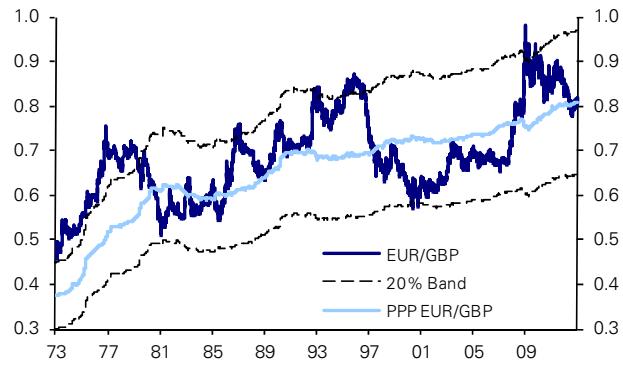
Source: DB FX Research

**Figure 10: EUR/JPY: The euro is close to fair value against the yen**



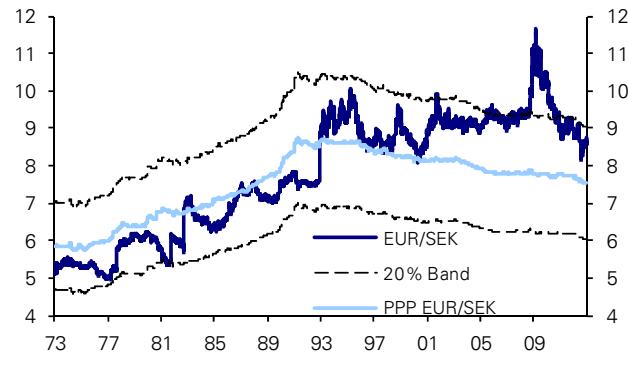
Source: DB FX Research

**Figure 11: EUR/GBP: Sterling is cheap against the euro**

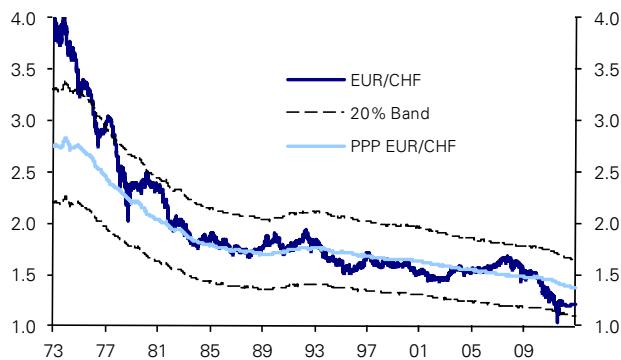


Source: DB FX Research

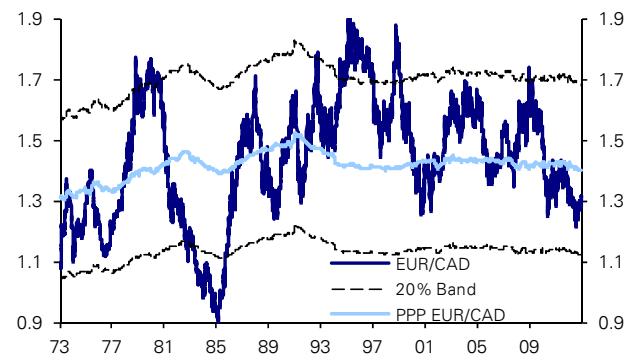
**Figure 12: EUR/SEK: SEK is very cheap versus the euro**



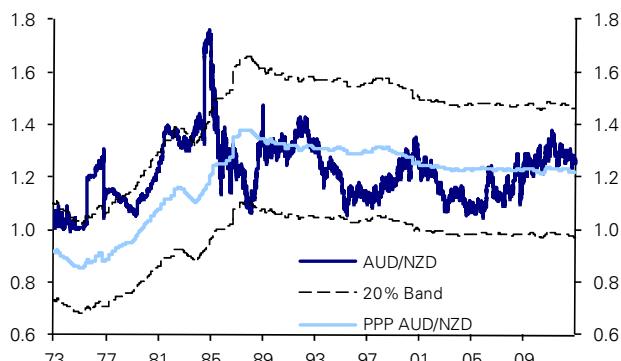
Source: DB FX Research

**Figure 13: EUR/CHF: CHF is expensive against the euro**

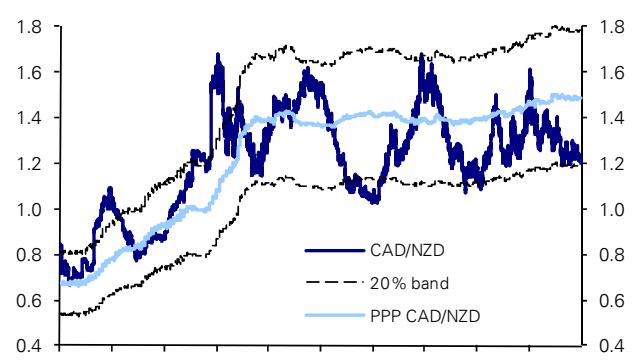
Source: DB FX Research

**Figure 14: EUR/CAD: CAD is close to fair value against euro**

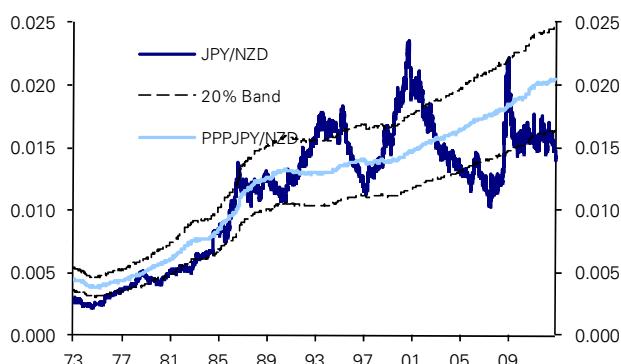
Source: DB FX Research

**Figure 15: AUD/NZD: NZD is bit cheap against AUD....**

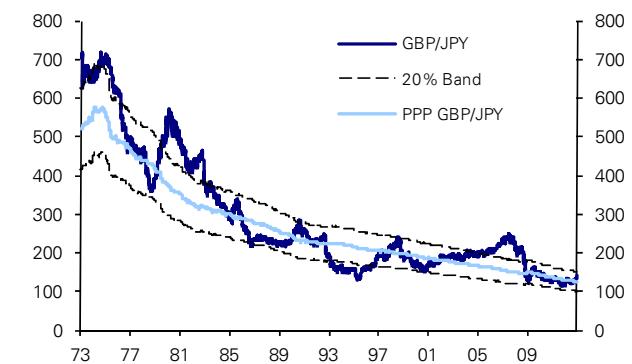
Source: DB FX Research

**Figure 16: CAD/NZD: ....and is expensive against CAD**

Source: DB FX Research

**Figure 17: JPY/NZD: NZD is expensive against the yen**

Source: DB FX Research

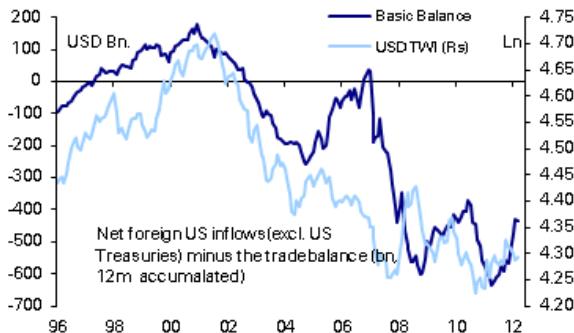
**Figure 18: GBP/JPY: JPY is close to market value against GBP**

Source: DB FX Research

## G10 Capital Flows and Basic Balance Monitor

United States (USD bn)

**Figure 1: The basic balance is on a recovery path over the last one year**



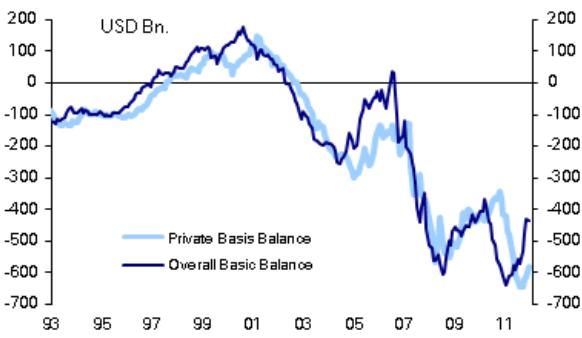
Source: DB FX Research and US Treasury

**Figure 2: as non treasury portfolio outflows have turned positive**



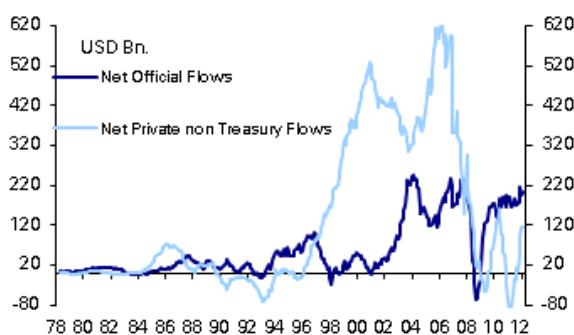
Source: DB FX Research and US Treasury

**Figure 3: The private basis balance has been diverging from the overall balance**



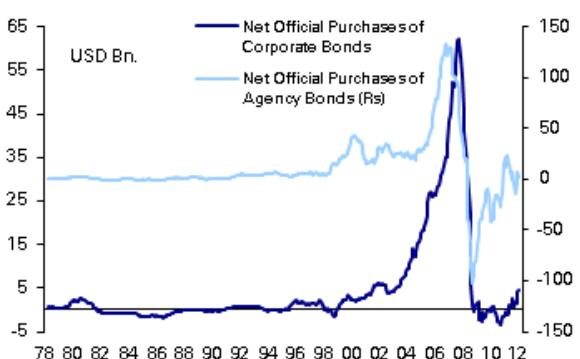
Source: DB FX Research and US Treasury

**Figure 5: Official inflows inversely correlated with private inflows since the late 1990s**



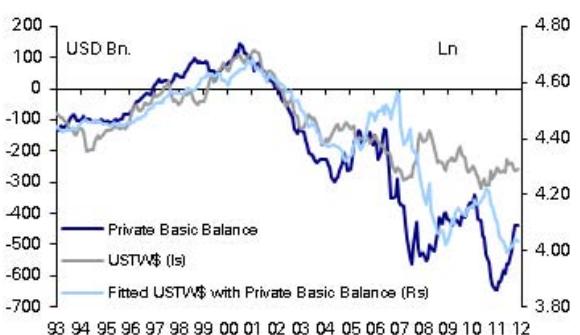
Source: DB FX Research and Haver

**Figure 4: as official inflows become significant**

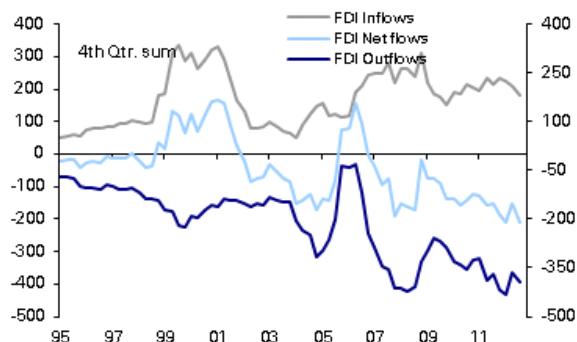


Source: DB FX Research and US Treasury

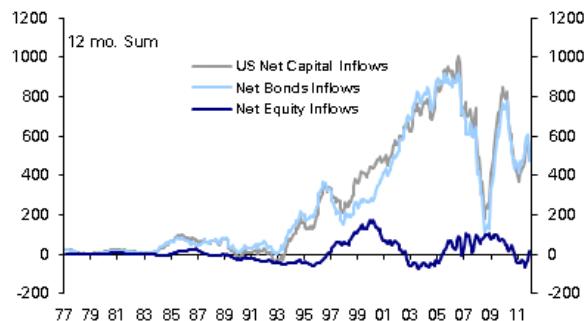
**Figure 6: Relative to the private basic balance, the dollar is expensive**



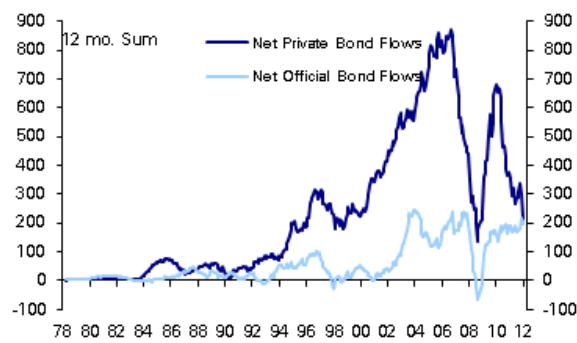
Source: DB FX Research and US Treasury

**Figure 7: Net FDI outflows accelerate**

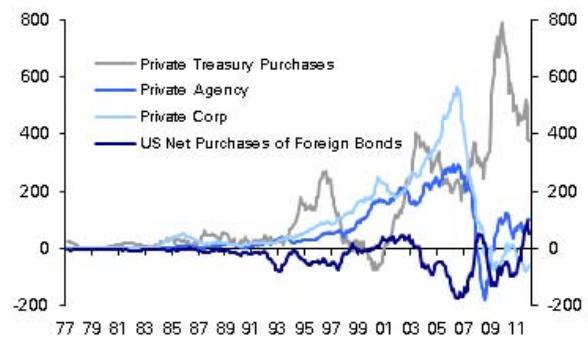
Source: DB FX Research and US Treasury

**Figure 8: Portfolio flows were driven mostly by net bond flows, while net equity flows remain modest**

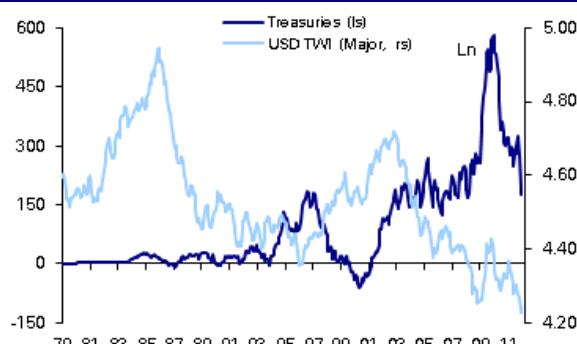
Source: DB FX Research and US Treasury

**Figure 9: Official sector buying of US bonds are now almost equal to private buying**

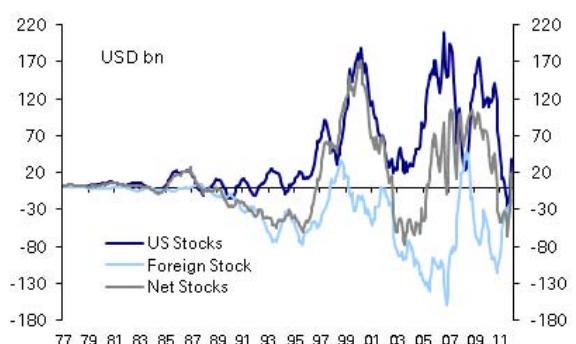
Source: DB FX Research and US Treasury

**Figure 10: Treasury purchase by private sector has fallen substantially**

Source: DB FX Research and US Treasury

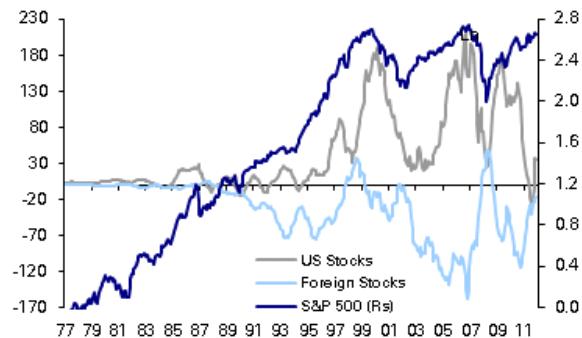
**Figure 11: No clear relationship between USD TWI and UST purchases**

Source: DB FX Research and US Treasury

**Figure 12: Net equity flows turn positive**

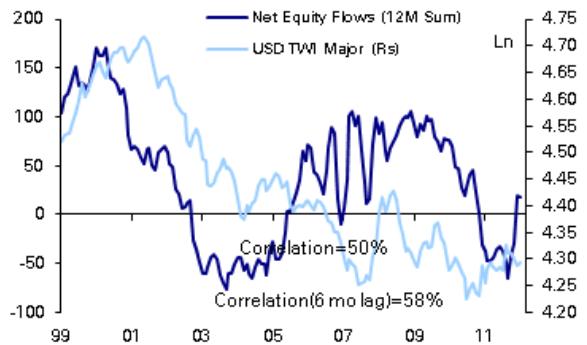
Source: DB FX Research and US Treasury

**Figure 13: Equity flows tend to respond with a lag to market performance**



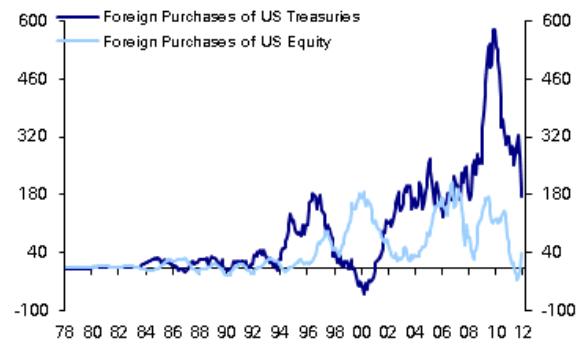
Source: Deutsche Bank, US Treasury and Bloomberg Finance LP

**Figure 14: The dollar is increasingly following net equity flows**



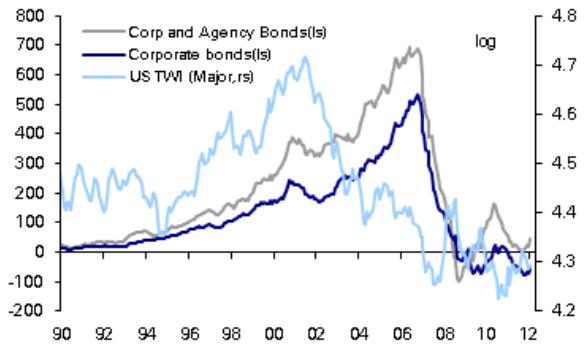
Source: Deutsche Bank, US Treasury and Bloomberg Finance LP

**Figure 15: Generally inverse link between foreign interest in USTs versus US equities**



Source: Deutsche Bank and US Treasury

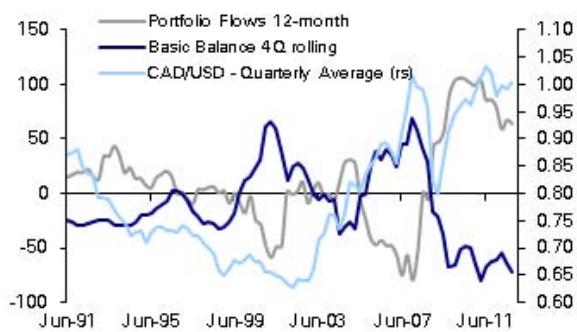
**Figure 16: The dollar and agency & corp bond inflows**



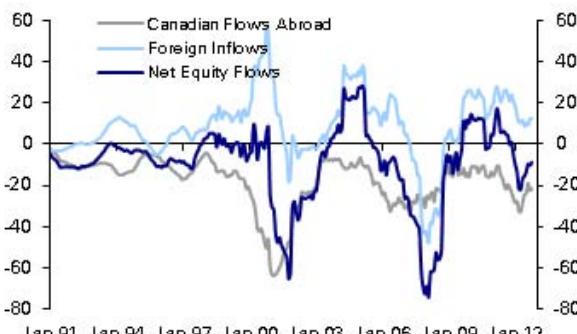
Source: Deutsche Bank, US Treasury and Bloomberg Finance LP

**Canada (CAD bn)****Figure 1: The basic balance has generally been in a downtrend since 2007**

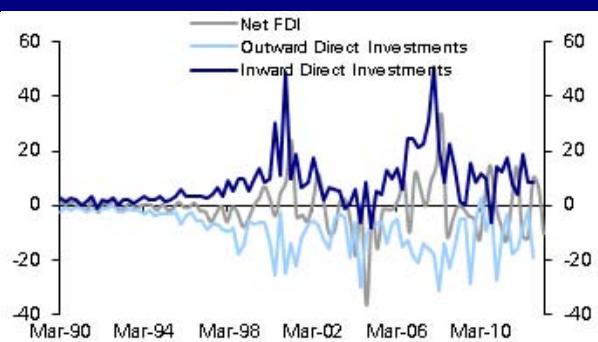
Source: DB FX Research and Haver

**Figure 3: Portfolio inflows seem to have peaked after an upsurge since 2008**

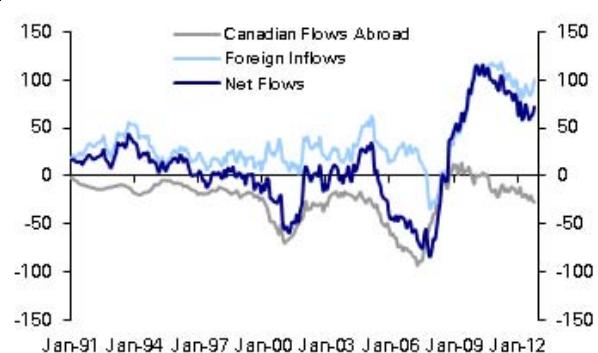
Source: DB FX Research and Haver

**Figure 5: Net equity outflows continue unabated**

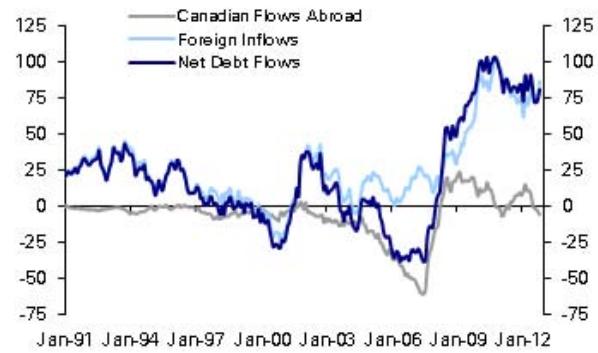
Source: DB FX Research and Haver

**Figure 2: as net FDI outflows continue**

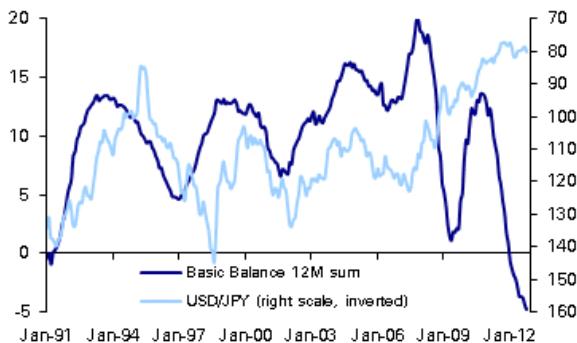
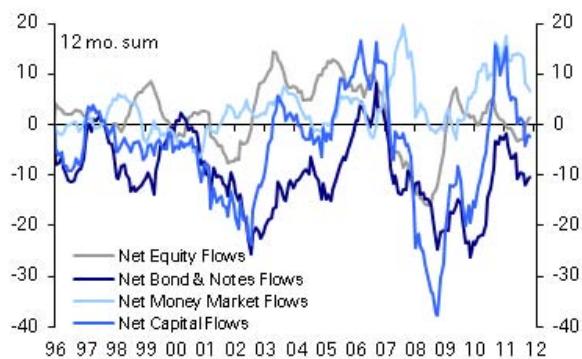
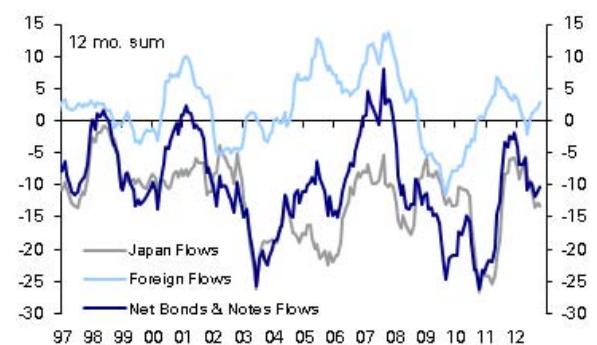
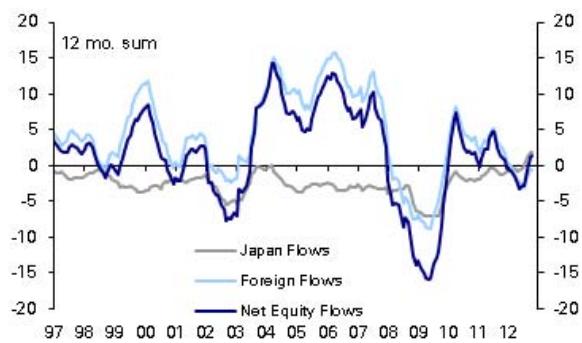
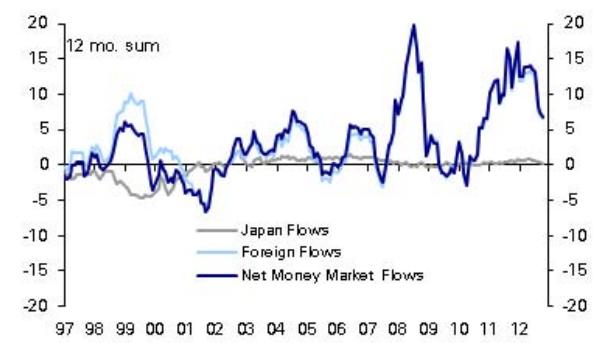
Source: DB FX Research and Haver

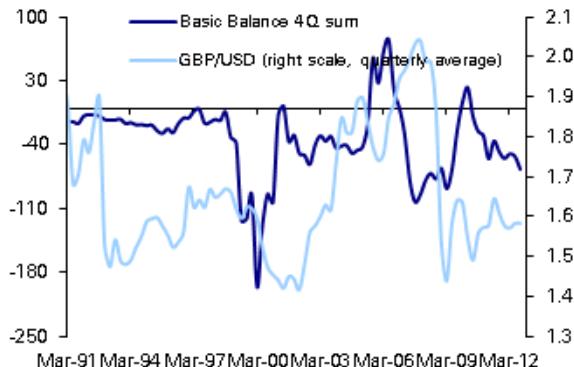
**Figure 4: as foreign interest in Canadian securities has fallen from record highs**

Source: DB FX Research and Haver

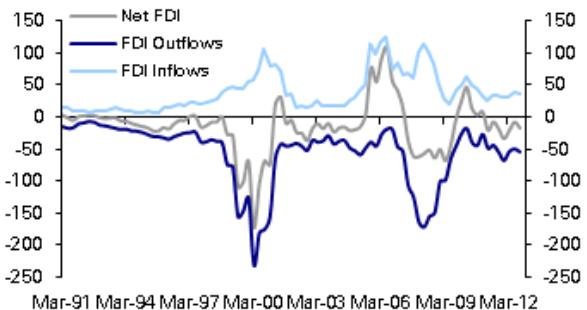
**Figure 6: while net debt inflows have started moderating from record highs.**

Source: DB FX Research and Haver

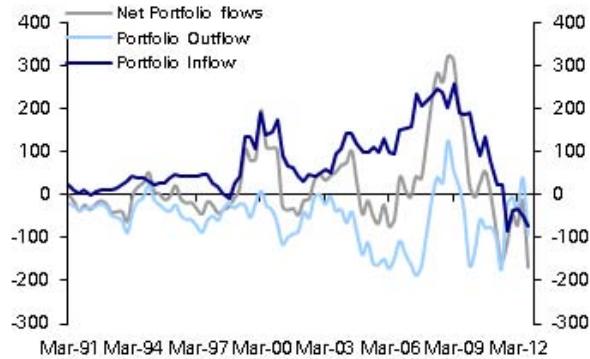
**Japan (JPY trillion)****Figure 1: The negative basic balance has been accelerating recently...****Figure 2: ...as net FDI outflows gather momentum****Figure 3: Net capital inflows have turned negative****Figure 4: Net bond outflows have accelerated****Figure 5: Net equity flows have turned positive****Figure 6: Net money-market inflows have fallen**

**United Kingdom (GBP bn)****Figure 1: The basic balance remains negative**

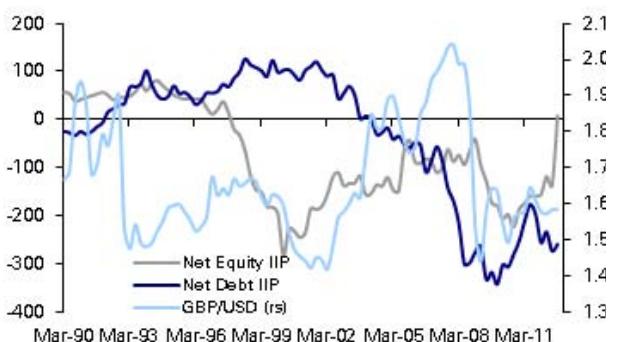
Source: DB FX Research and Haver

**Figure 2: Net FDI inflows have turned course**

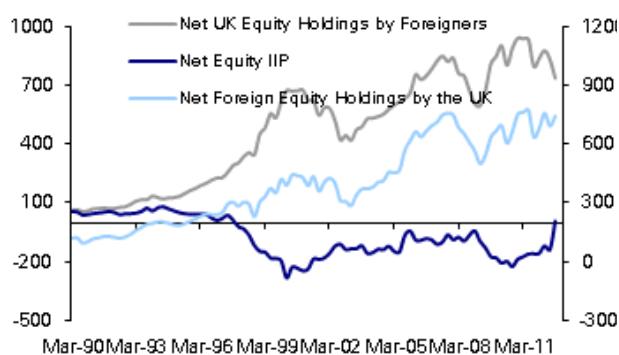
Source: DB FX Research and Haver

**Figure 3: Portfolio flows remain negative**

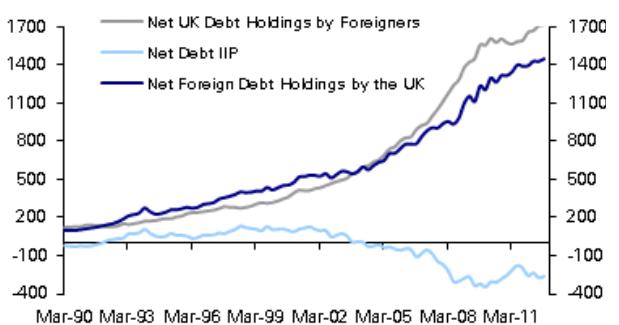
Source: DB FX Research and Haver

**Figure 4: Net equity and net debt positions**

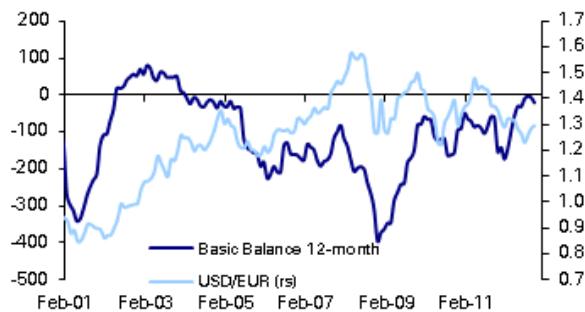
Source: DB FX Research and BoE

**Figure 5: Net holdings of equities**

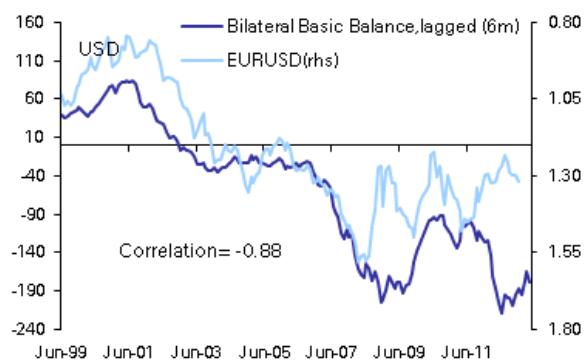
Source: DB FX Research and BoE

**Figure 6: Net debt holdings**

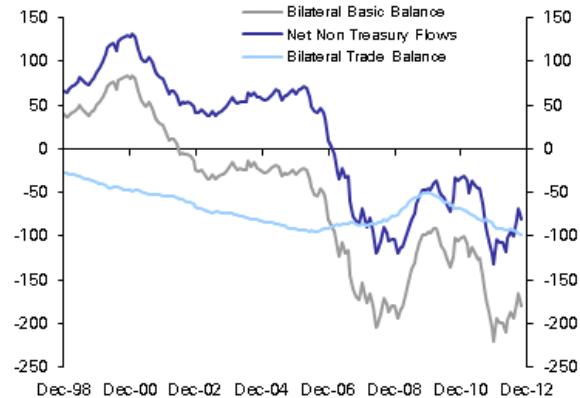
Source: DB FX Research and BoE

**Euro area (EUR bn)****Figure 1: The basic balance remains slightly negative...**

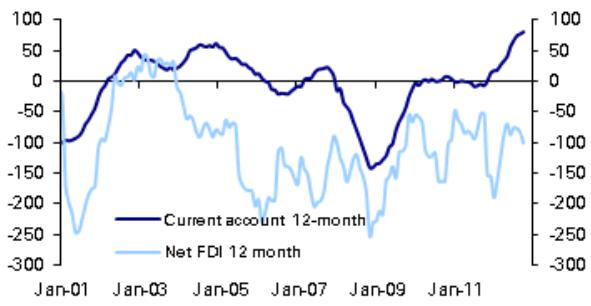
Source: DB FX Research and Eurostat

**Figure 3: EUR/USD strongly correlated (0.88) with bilateral basic balance with the US**

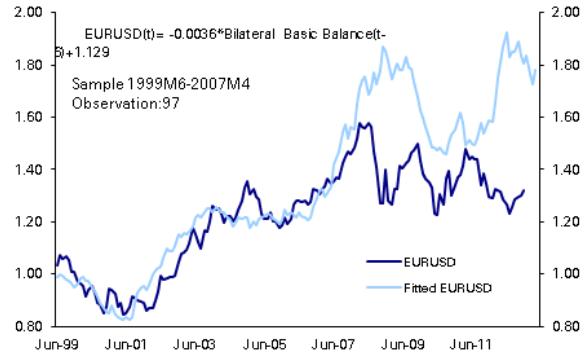
Source: DB FX Research and Eurostat

**Figure 5: The bilateral basic balance with the US has moved in favor of the US recently...**

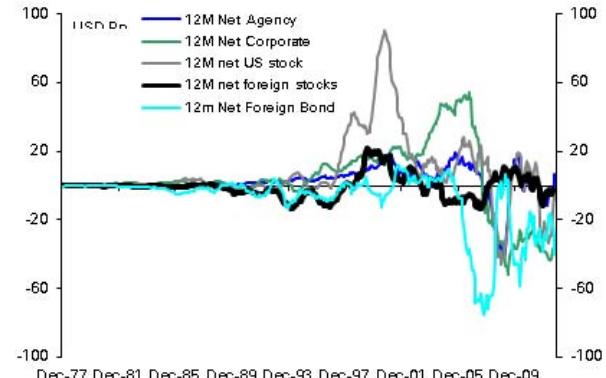
Source: DB FX Research and Eurostat

**Figure 2: ...as FDI outflows outpace the improvement in current account deficit**

Source: DB FX Research and Eurostat

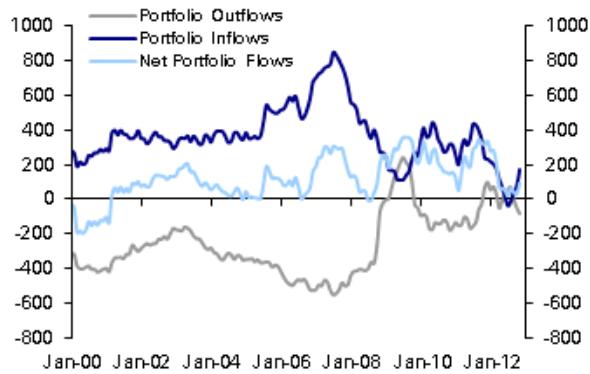
**Figure 4: Bilateral basic balance explains 84% of EUR/USD movements since inception of the euro**

Source: DB FX Research and Eurostat

**Figure 6: ...as US purchases of euro area bonds have continued to be replaced by sales**

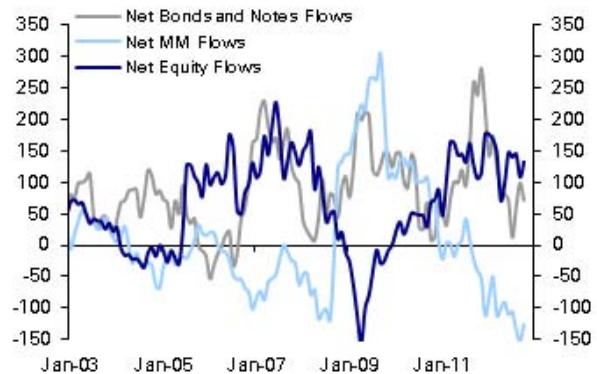
Source: Deutsche Bank and US Treasury

**Figure 7: Net portfolio inflows have fallen off substantially...**



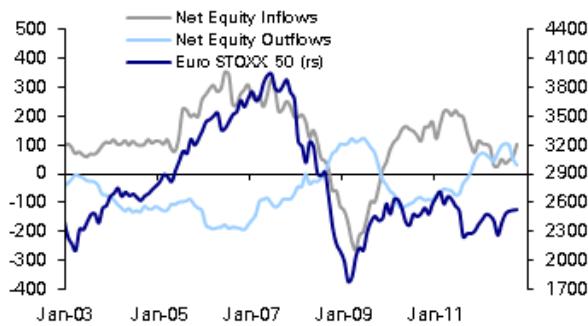
Source: Deutsche Bank and European Central Bank

**Figure 8: ...as falls in debt inflows outpace inflows to the equity market**



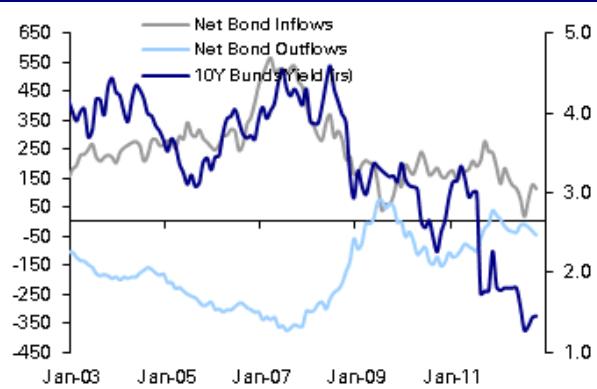
Source: Deutsche Bank and European Central Bank

**Figure 9: Equity inflows have tracked the STOXX**

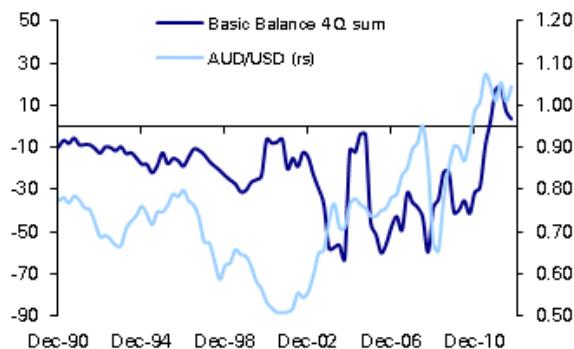


Source: Deutsche Bank, Bloomberg and European Central Bank

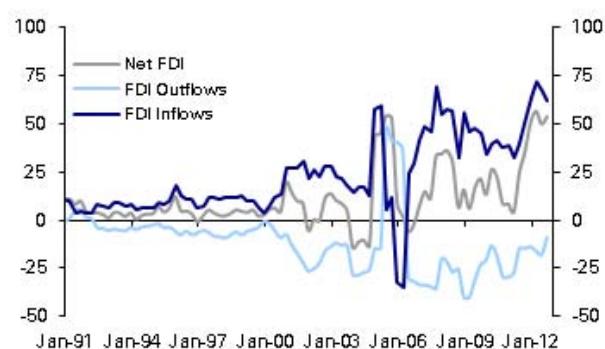
**Figure 10: Foreign interest on the bond side boomed in late 2006 and has slowed now**



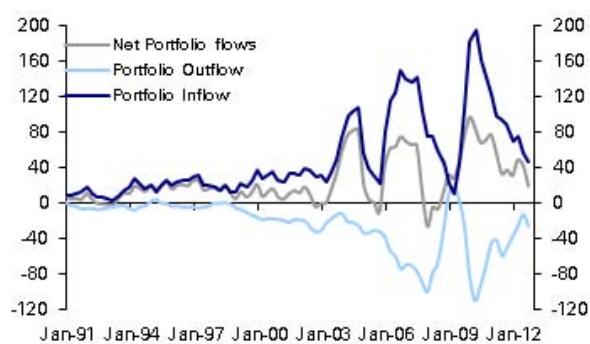
Source: Deutsche Bank and European Central Bank

**Australia (AUD bn)****Figure 1: The basic balance remains positive...**

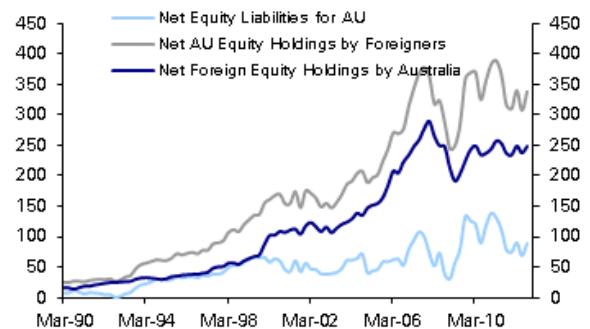
Source: DB FX Research and RBA

**Figure 2: ...as net FDI inflows continue to climb**

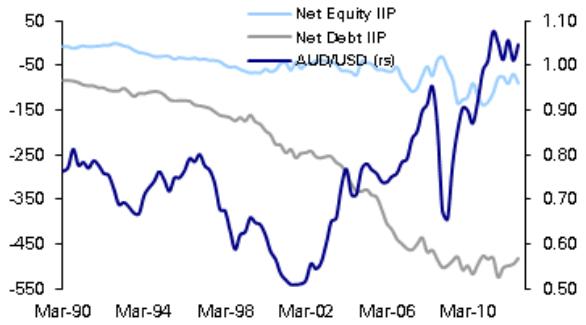
Source: DB FX Research and RBA

**Figure 3: Net Portfolio flows have been falling since 2010**

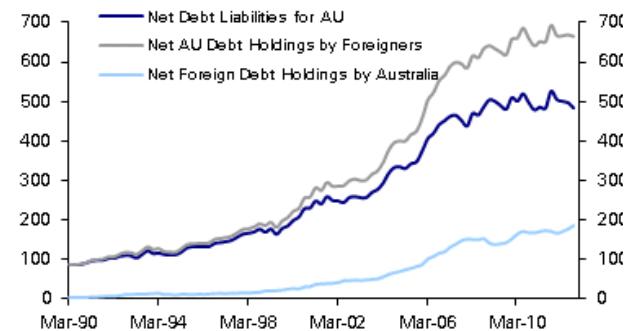
Source: DB FX Research and RBA

**Figure 5: ...and to a lesser extent equities...**

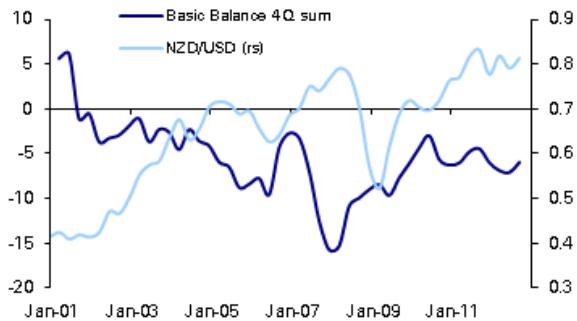
Source: DB FX Research and RBA

**Figure 4: Foreign investors have favored Australian debt (negative IIP a liability for AU)...**

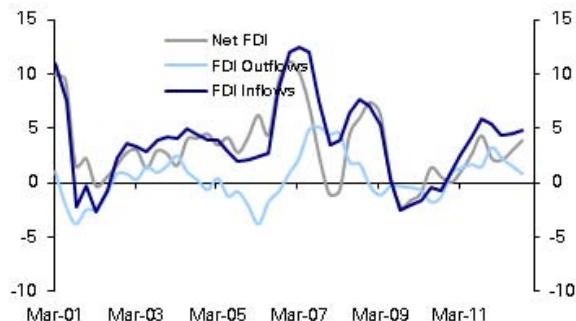
Source: DB FX Research and RBA

**Figure 6: ...with relatively modest purchases by Australians of foreign debt**

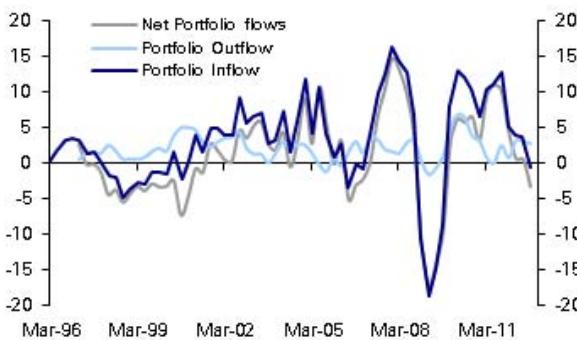
Source: DB FX Research and RBA

**New Zealand (NZD bn)****Figure 1: The basic balance**

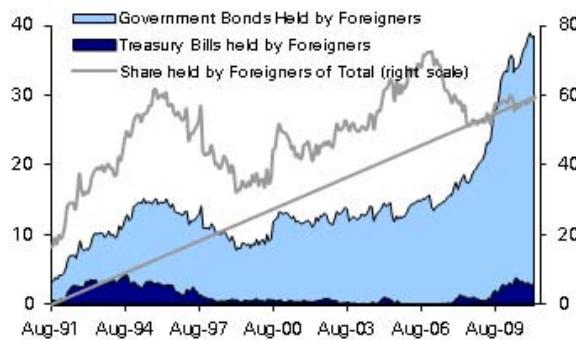
Source: DB FX Research and Haver

**Figure 2: FDI flows**

Source: DB FX Research and Haver

**Figure 3: Net Portfolio inflows have switched to negative territory**

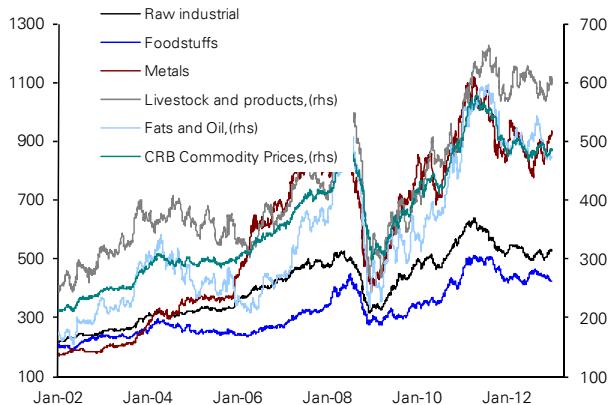
Source: DB FX Research and Haver

**Figure 4: Foreign appetite for government bonds**

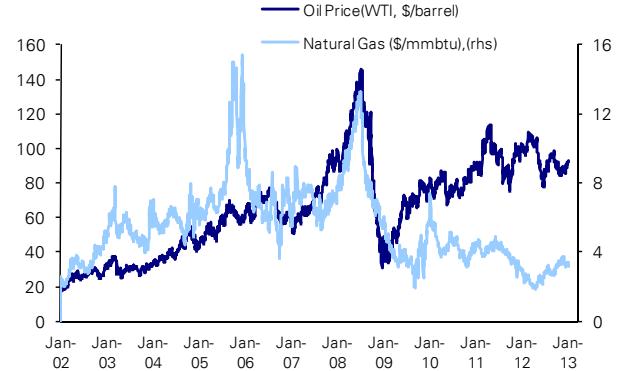
Source: DB FX Research and NZ FinMin

## Commodity Price and Currency Monitor

**Figure 1: CRB Commodity Prices and components**



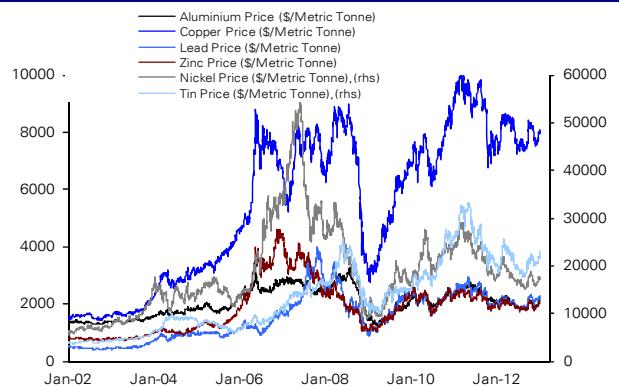
**Figure 2: Energy prices**



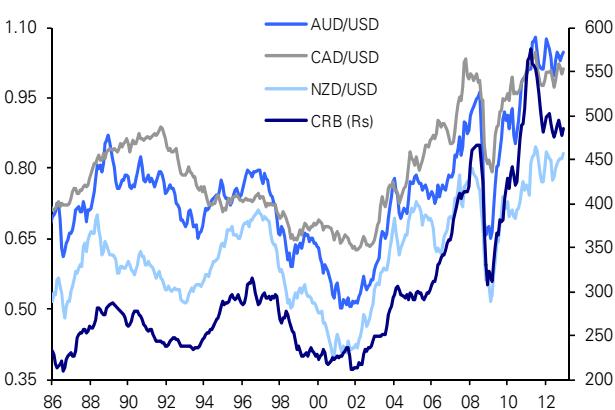
**Figure 3: Precious metals**



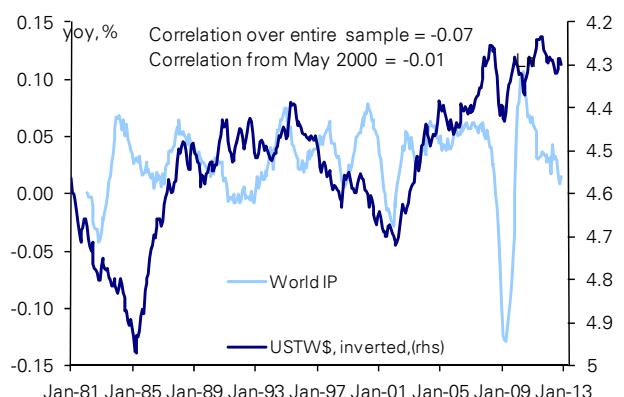
**Figure 4: Industrial metals**

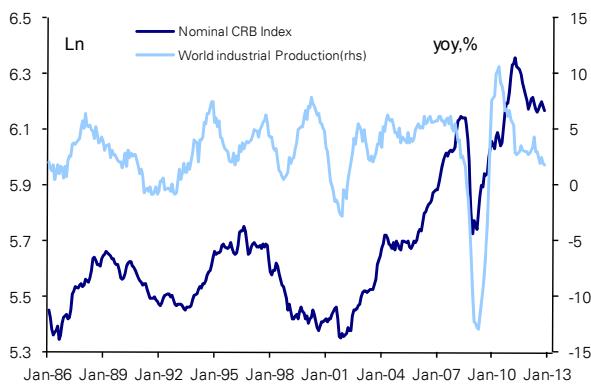
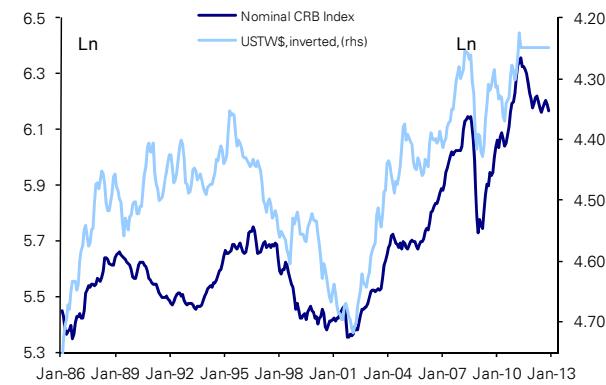
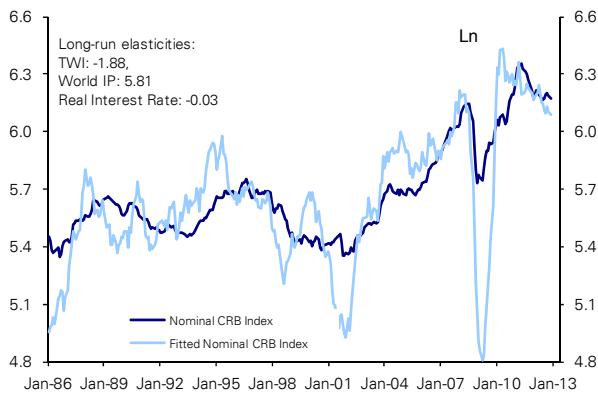
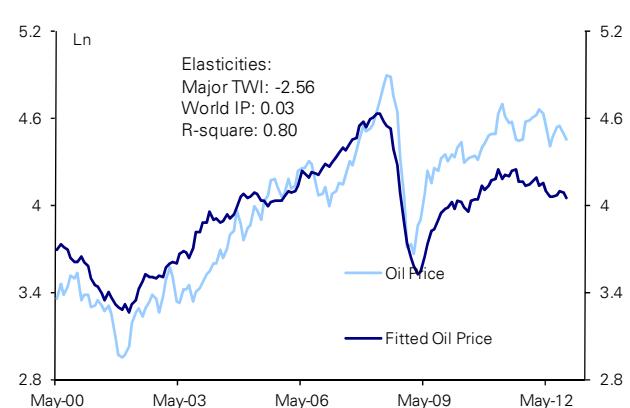
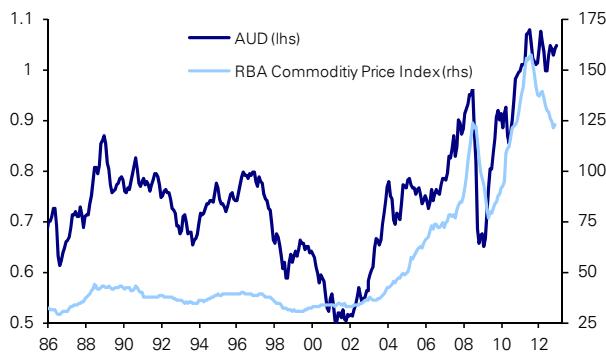
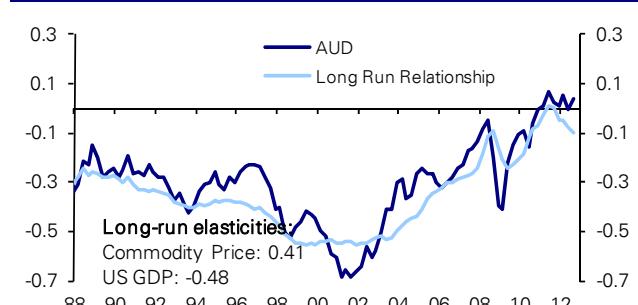


**Figure 5: Commodity Currencies and Prices**

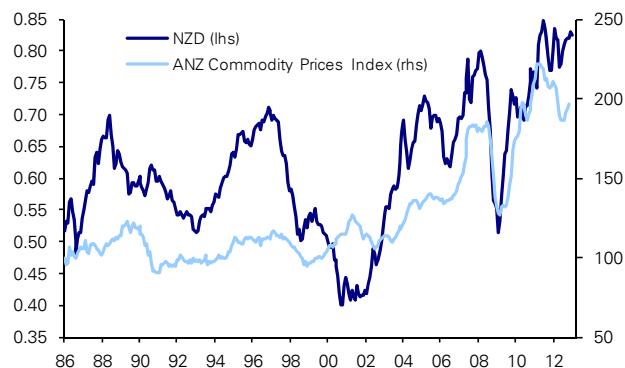


**Figure 6: The dollar cycle and global growth cycle**



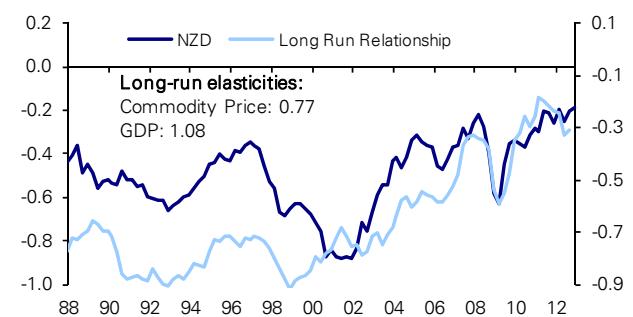
**Figure 7: Nominal CRB and World IP Growth****Figure 8: Nominal CRB and the Dollar****Figure 9: Long-run Relationship- Nominal CRB****Figure 10: Long-run Relationship- Oil****Figure 11: RBA Commodity Price Index (Nominal) and AUD/USD****Figure 12: Long-run Relationship-AUD/USD**

**Figure 13: ANZ Commodity Price Index (Nominal) and NZD/USD**



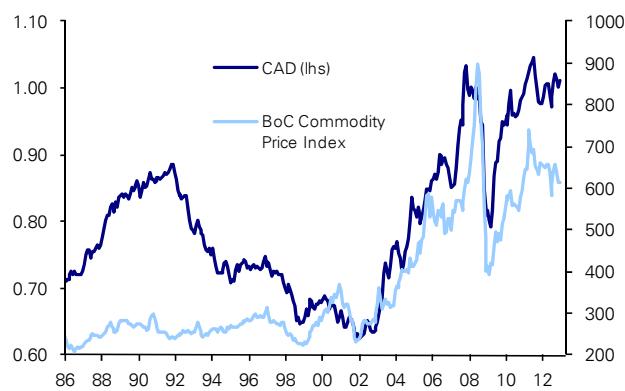
Source: Deutsche Bank, Haver

**Figure 14: Long-run Relationship-NZD/USD**



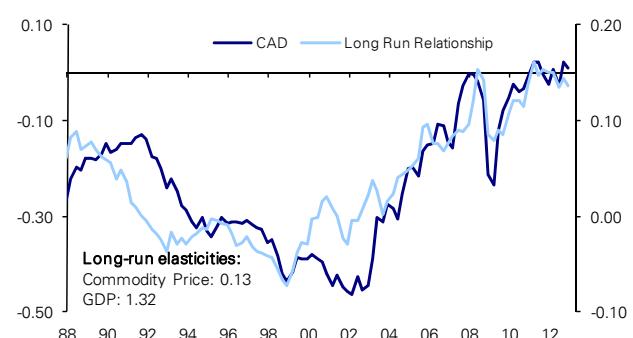
Source: Deutsche Bank, Haver

**Figure 15: BoC Commodity Price Index (Nominal) and CAD/USD**



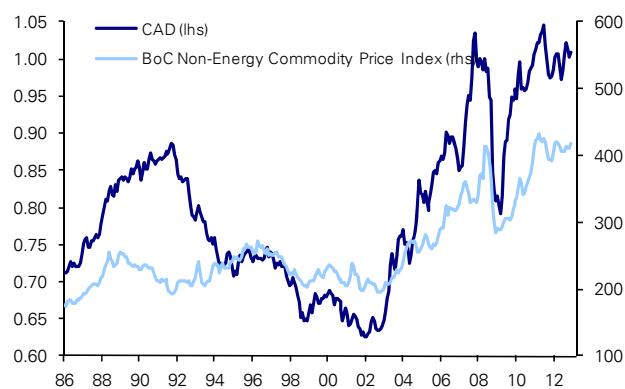
Source: Deutsche Bank, Haver

**Figure 16: Long-run Relationship-CAD/USD**



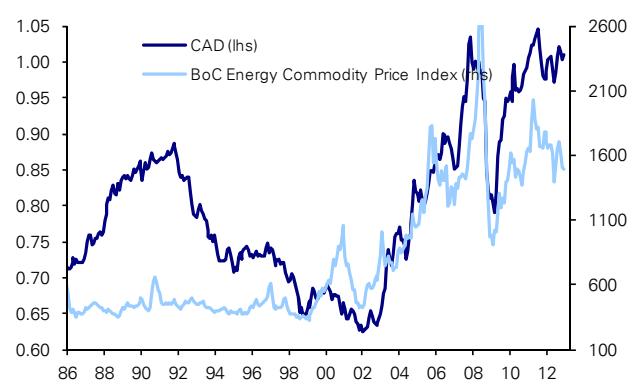
Source: Deutsche Bank, Haver

**Figure 17: BoC Non-Energy Commodity Price Index (Nominal) and CAD/USD**

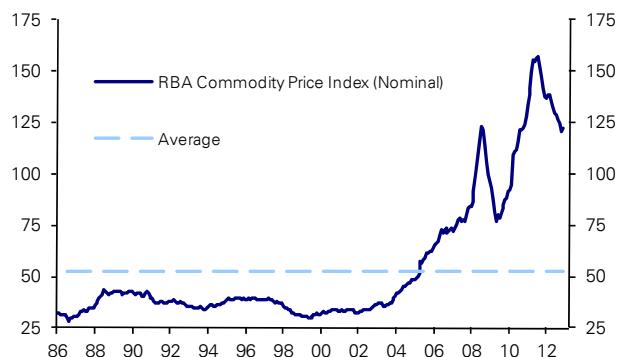


Source: Deutsche Bank, Haver

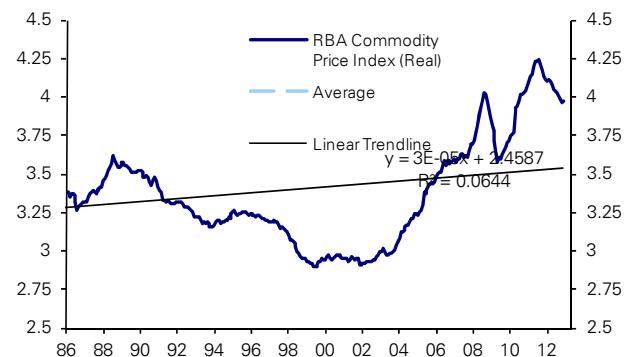
**Figure 18: BoC Energy Commodity Price Index (Nominal) and CAD/USD**



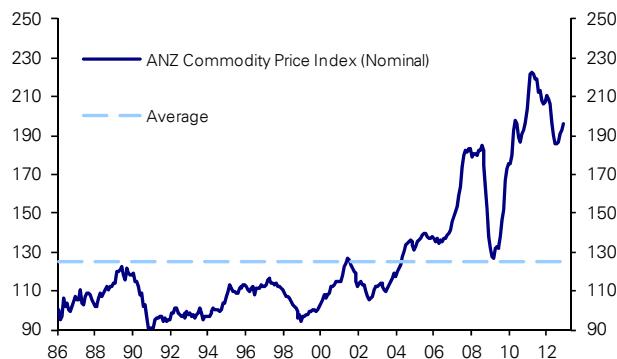
Source: Deutsche Bank, Haver

**Figure 19: RBA Commodity Price (Nominal)**

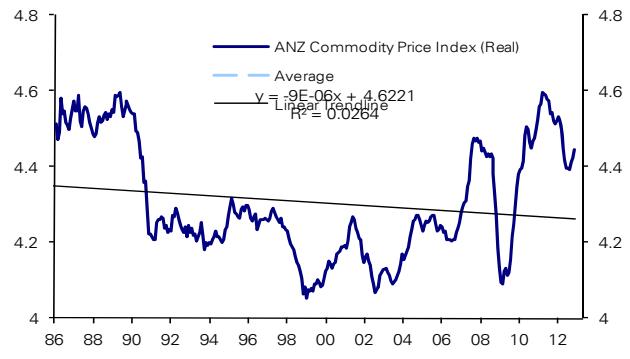
Source: Deutsche Bank, Haver

**Figure 20: RBA Commodity Price (Real)**

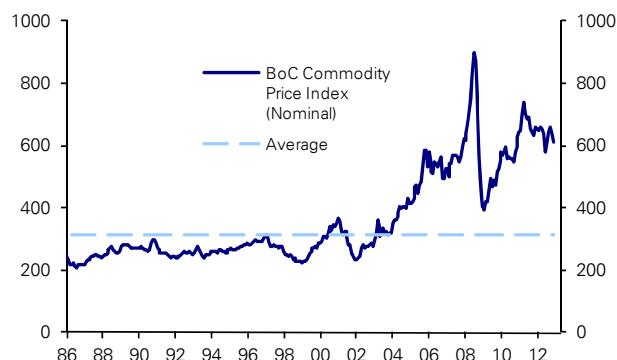
Source: Deutsche Bank, Haver

**Figure 21: ANZ Commodity Price (Nominal)**

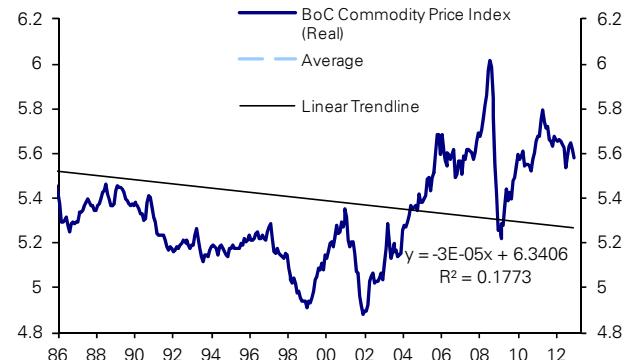
Source: Deutsche Bank, Haver

**Figure 22: ANZ Commodity Price (Real)**

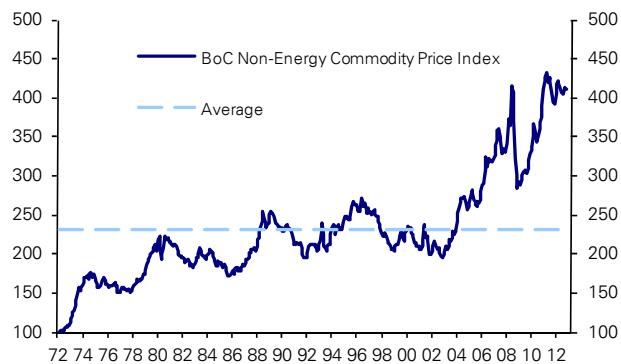
Source: Deutsche Bank, Haver

**Figure 23: BoC Commodity Price (Nominal)**

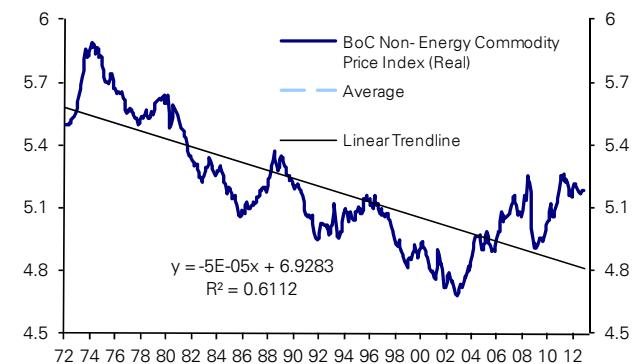
Source: Deutsche Bank, Haver

**Figure 24: BoC Commodity Price (Real)**

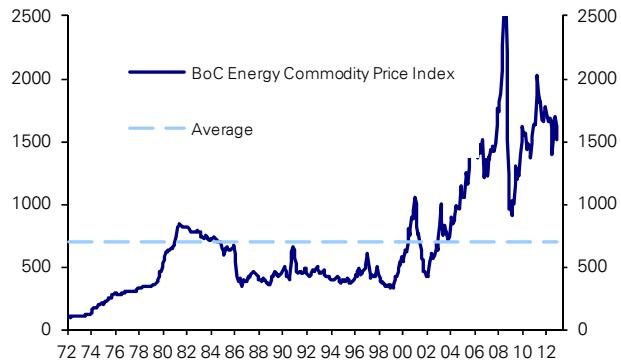
Source: Deutsche Bank, Haver

**Figure 25: BoC Non-Energy Commodity Price (Nominal)**


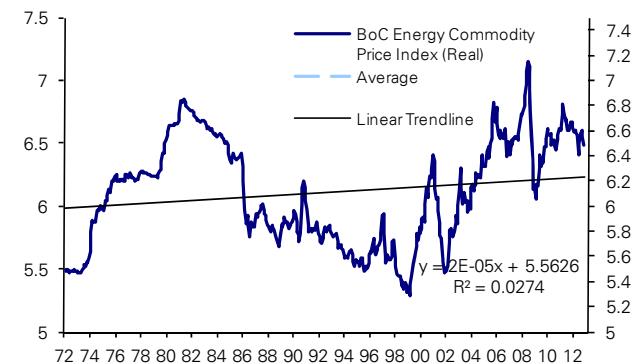
Source: Deutsche Bank, Haver

**Figure 26: BoC Non-Energy Commodity Prices (Real)**


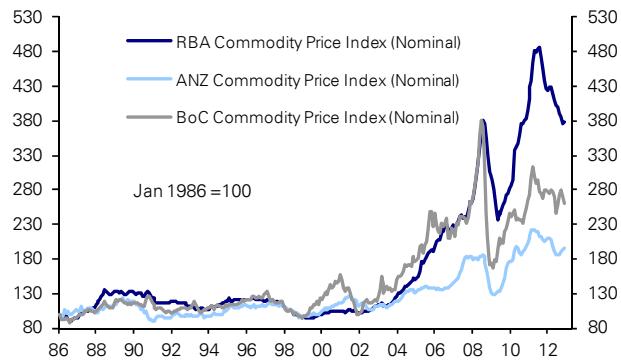
Source: Deutsche Bank, Haver

**Figure 27: BoC Energy Commodity Price (Nominal)**


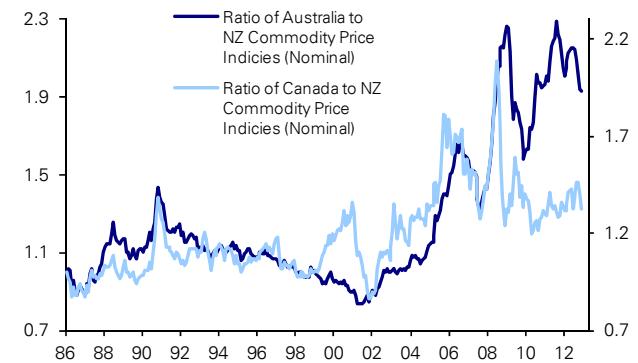
Source: Deutsche Bank, Haver

**Figure 28: BoC Energy Commodity Price (Real)**


Source: Deutsche Bank, Haver

**Figure 29: Commodity Price Indices**


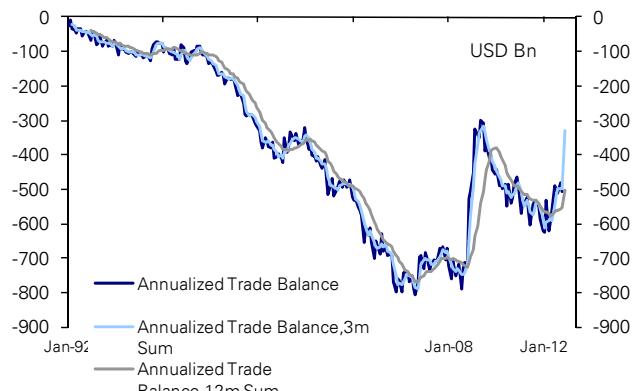
Source: Deutsche Bank, Haver

**Figure 30: Ratio of Commodity Price Indices**


Source: Deutsche Bank, Haver

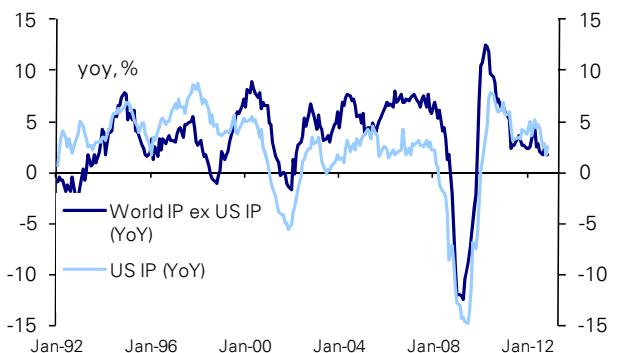
## U.S. Trade Balance Monitor

**Fig 1: The US trade deficit has started a mild recovery**



Source: DataStream, Deutsche Bank.

**Fig 2: US and world growth recovery has lost momentum**



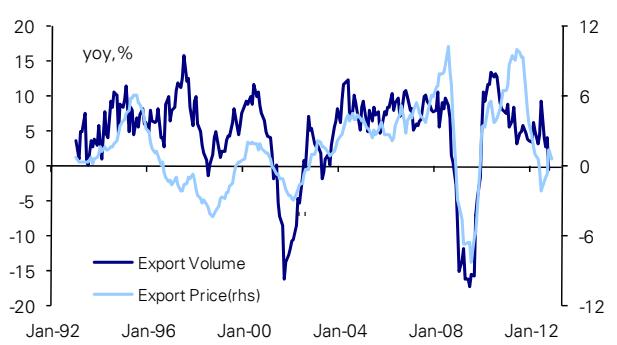
Source: DataStream, Deutsche Bank

**Fig 3: The narrowing in the deficit reflected a outpacing of import growth by export growth**



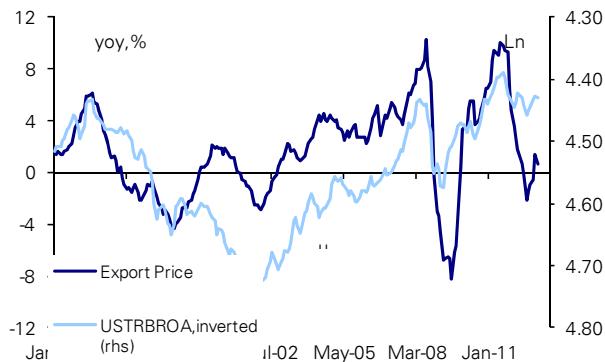
Source: DataStream, Deutsche Bank

**Fig 4: Recently export prices have receded sharply while export volumes remain at the same level**



Source: DataStream, Deutsche Bank

**Fig 5: Export prices tend to follow the dollar**



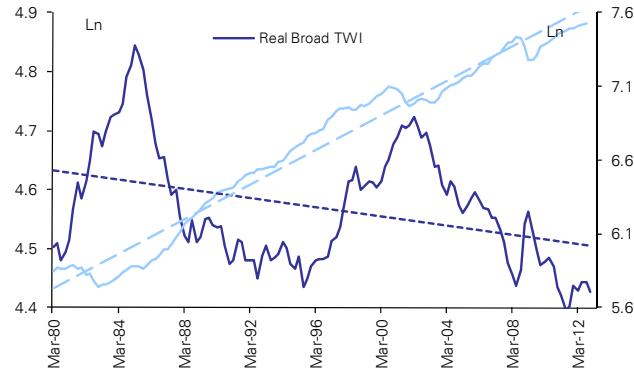
Source: DataStream, Deutsche Bank

**Fig 6: Export volume growth closely follows external demand**



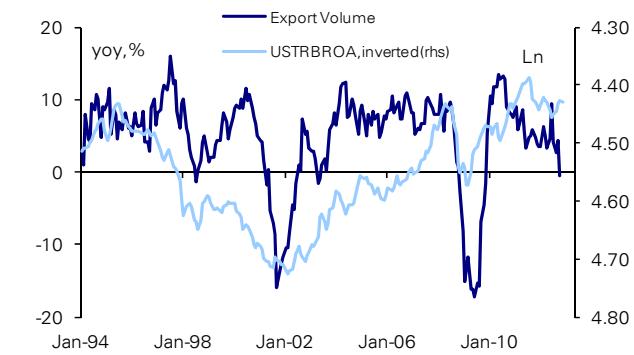
Source: DataStream, Deutsche Bank

**Fig 7: Export volumes have remained below trend since 2001**



Source: DataStream, Deutsche Bank

**Fig 9: A brief end to the dollar upsurge seems to have boosted export volume growth**



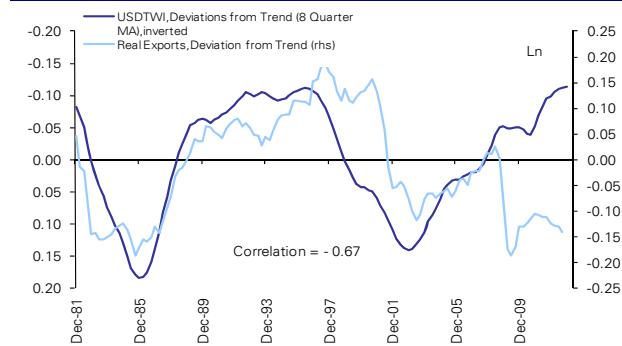
Source: DataStream, Deutsche Bank

**Fig 11: Import price inflation has followed the dollar**



Source: DataStream, Deutsche Bank

**Fig 8: Export volume deviations from trend strongly correlated with moving average of dollar valuation**



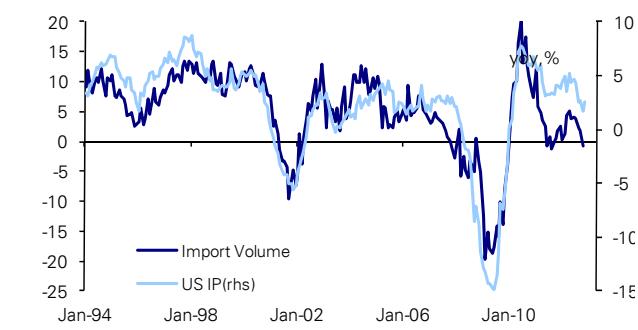
Source: DataStream, Deutsche Bank

**Fig 10: The recent sharp increase in import price inflation has tapered off during the past few months**



Source: DataStream, Deutsche Bank

**Fig 12: Import volume growth has generally been highly correlated with US domestic demand growth**



Source: DataStream, Deutsche Bank

**Fig 13: U.S. Exports and Imports of Goods and Services (Balance of Payments Basis) (last 13 months)**

	Oct Units	Nov 2011	Dec 2011	Jan 2012	Feb 2012	Mar 2012	Apr 2012	May 2012	Jun 2012	Jul 2012	Aug 2012	Sep 2012	Oct 2012	
Exports	(US\$ bn.)	178.7	176.7	177.8	178.8	180.3	184.9	182.6	183.3	185.7	183.5	181.7	187.3	180.5
Imports	(US\$ bn.)	224.4	225.5	229.5	231.0	224.9	236.5	232.3	230.2	226.6	225.1	224.3	227.6	222.8
Trade Balance	(US\$ bn.)	-45.7	-48.8	-51.7	-52.2	-44.5	-51.6	-49.6	-46.9	-40.8	-41.6	-42.6	-40.3	-42.2
<b>Export &amp; Import Growth</b>														
Exports	(y-o-y %)	11.5%	9.0%	7.4%	6.4%	8.3%	6.1%	4.0%	4.3%	7.6%	2.9%	1.9%	3.7%	1.0%
Imports	(y-o-y %)	11.8%	12.2%	11.3%	7.1%	6.4%	8.0%	6.0%	3.1%	1.6%	0.5%	0.5%	1.1%	-0.8%
Growth Differential		-0.3%	-3.2%	-3.9%	-0.8%	1.9%	-1.8%	-2.0%	1.3%	6.0%	2.4%	1.4%	2.6%	1.7%

**Fig 14: U.S. Export and Import Orders (ISM Survey) (last 13 months)**

	Nov Units	Dec 2010	Jan 2011	Feb 2012	Mar 2012	Apr 2012	May 2012	Jun 2012	Jul 2012	Aug 2011	Sep 2012	Oct 2012	Nov 2012	
Export Orders	(index)	52.0	53.0	55.0	59.5	54.0	59.0	53.5	47.5	46.5	47.0	48.5	48.0	47.0
Import Orders	(index)	49.0	54.0	52.5	54.0	53.5	53.5	53.5	53.5	50.5	49.0	49.5	47.5	48.0
Exp.-Imp. Orders		3.0	-1.0	2.5	5.5	0.5	5.5	0.0	-6.0	-4.0	-2.0	-1.0	0.5	-1.0

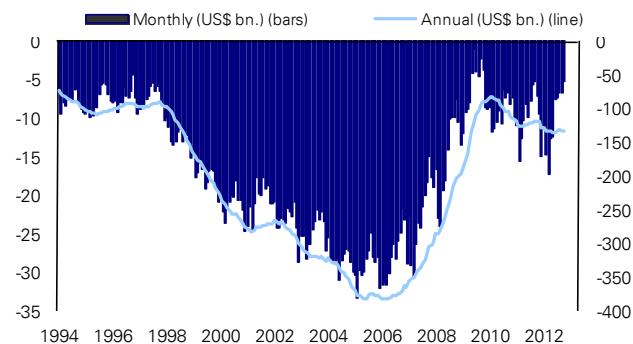
**Fig 15: Regional Breakdown of U.S. Trade Balance (US\$ bn.) (1998-2010)**

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Canada	-32.1	-51.9	-52.8	-48.2	-51.7	-66.5	-78.5	-71.8	-68.2	-78.3	-21.6	-28.5	-35.6
Mexico	-22.8	-24.6	-30.0	-37.1	-40.6	-45.2	-49.9	-64.5	-74.8	-64.7	-47.8	-66.4	-65.6
Brazil	1.9	1.5	1.4	-3.4	-6.7	-7.3	-9.1	-7.5	-1.5	1.8	6.0	11.5	11.6
Western Europe	-47.9	-59.4	-64.8	-88.4	-98.9	-112.8	-125.6	-118.5	-109.0	-93.9	-61.1	-60.8	-63.2
Germany	-28.4	-29.1	-29.1	-35.9	-39.3	-45.8	-50.6	-47.9	-44.7	-43.0	-28.2	-34.3	-49.3
U.K.	-0.8	-1.8	-0.7	-7.5	-9.0	-10.4	-12.5	-8.1	-6.9	-5.0	-1.8	-1.4	4.8
Japan	-73.4	-81.6	-69.0	-70.0	-66.0	-76.2	-83.3	-89.7	-84.3	-74.1	-44.7	-60.1	-62.6
China	-68.7	-83.8	-83.1	-103.1	-124.1	-162.3	-202.3	-234.1	-258.5	-268.0	-226.9	-273.1	-295.5
Hong Kong	2.1	3.1	4.4	3.3	4.7	6.5	7.5	9.8	12.9	15.0	17.5	22.3	32.2
South Korea	-8.2	-12.5	-13.0	-13.0	-13.2	-20.0	-16.2	-13.6	-13.2	-13.4	-10.6	-10.0	-13.1
Singapore	-1.9	-1.4	2.7	1.4	1.4	4.0	5.4	6.1	7.2	12.0	6.5	11.6	12.3
Taiwan	-16.1	-16.1	-15.3	-13.8	-14.2	-13.0	-13.2	-15.5	-12.4	-11.4	-9.9	-9.8	-15.4
U.S. Total	-303.0	-397.8	-375.1	-422.6	-481.9	-589.0	-690.9	-734.5	-714.9	-735.0	-455.8	-575.8	-654.0

Source: DataStream, Deutsche Bank

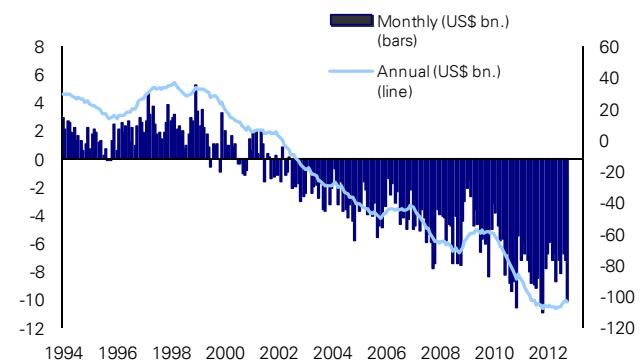
## U.S. Exports-Imports by Commodity

**Fig 16: U.S. Trade Balance Excluding China & Petroleum** (Monthly & Annual Balance)



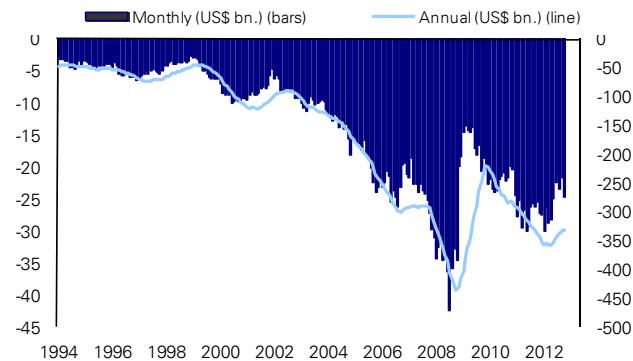
Source: DataStream

**Fig 17: U.S. Trade Balance – Advanced Technology**



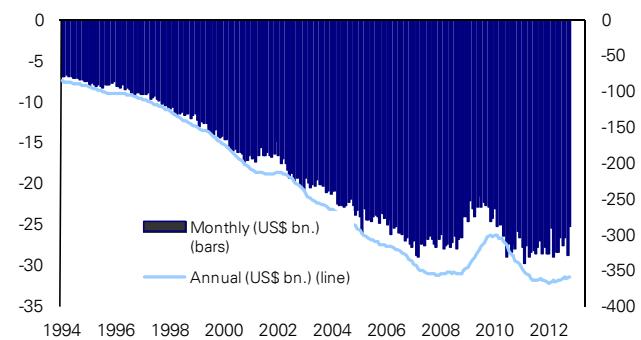
Source: DataStream

**Fig 18: U.S. Trade Balance – Petroleum Products**



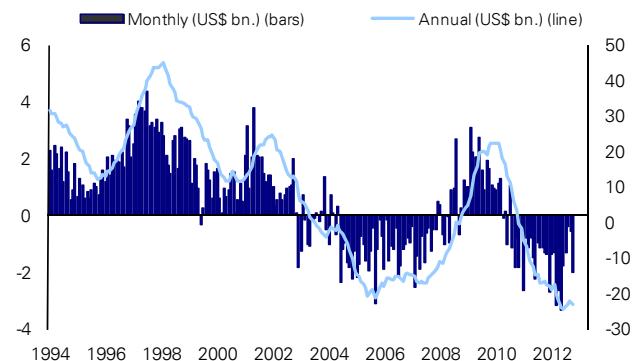
Source: DataStream

**Fig 19: U.S. Trade Balance – Consumer Goods**



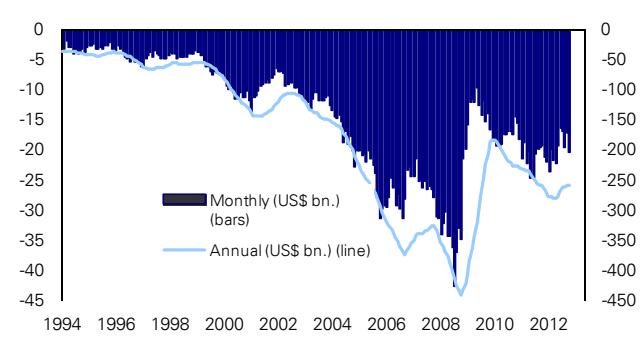
Source: DataStream

**Fig 20: U.S. Trade Balance – Capital Goods**

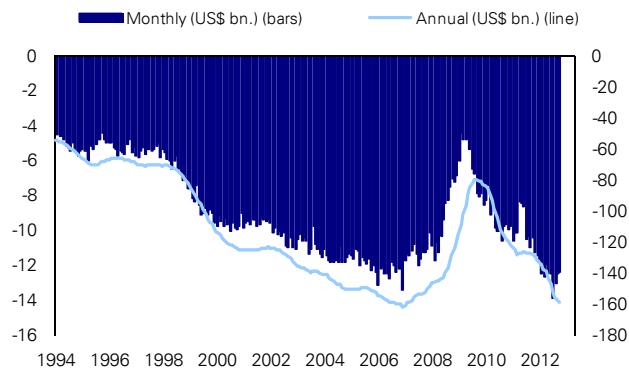


Source: DataStream

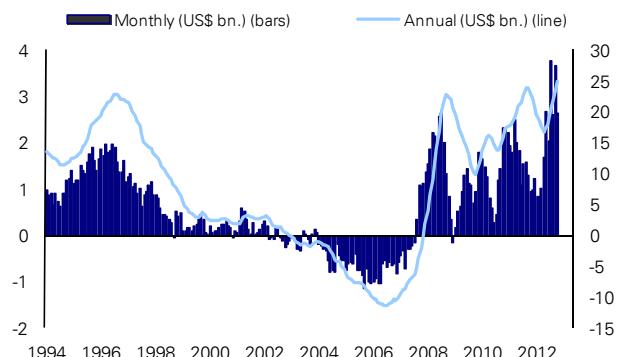
**Fig 21: U.S. Trade Balance – Industrial Supplies**



Source: DataStream

**Fig 22: U.S. Trade Balance – Automotive**

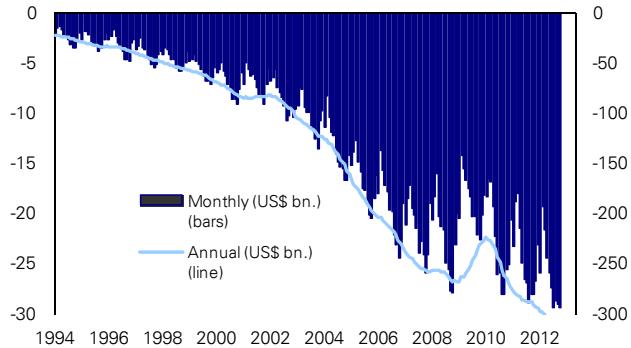
Source: DataStream

**Fig 23: U.S. Trade Balance – Food & Beverages**

Source: DataStream

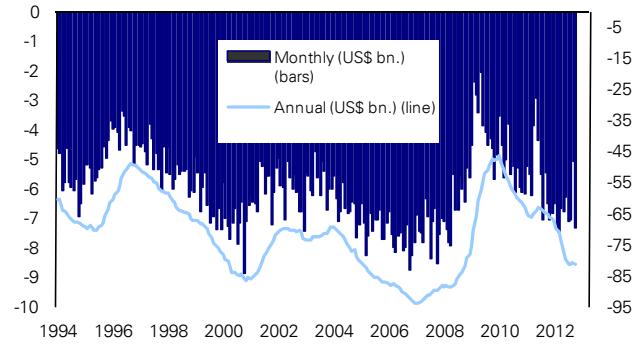
## U.S. Bilateral Trade Balances by Country & Region

**Fig 24: U.S. Trade Balance with China**



Source: DataStream

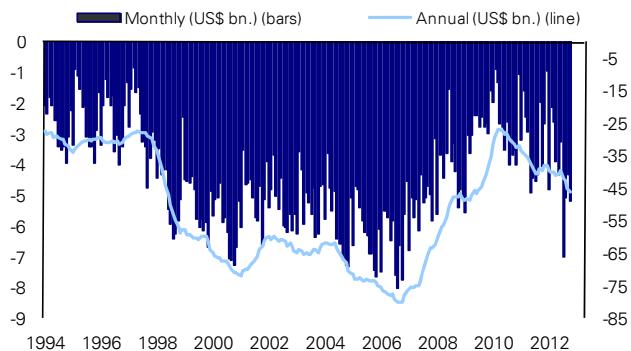
**Fig 25: U.S. Trade Balance with Japan**



Source: DataStream

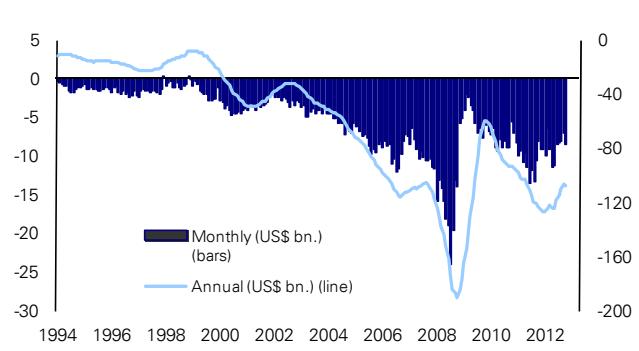
**Fig 26: U.S. Trade Balance with the Pacific Rim**

(Asia excluding China and Japan)



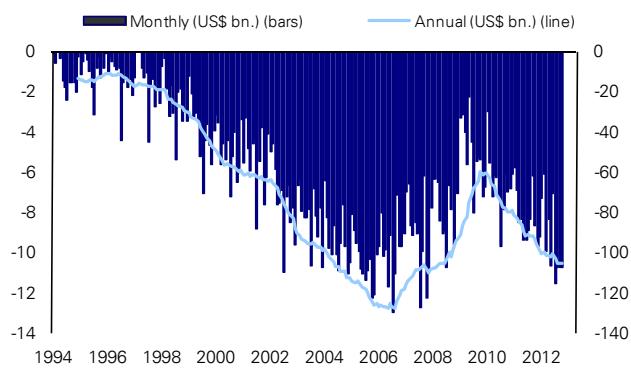
Source: DataStream

**Fig 27: U.S. Trade Balance with OPEC**



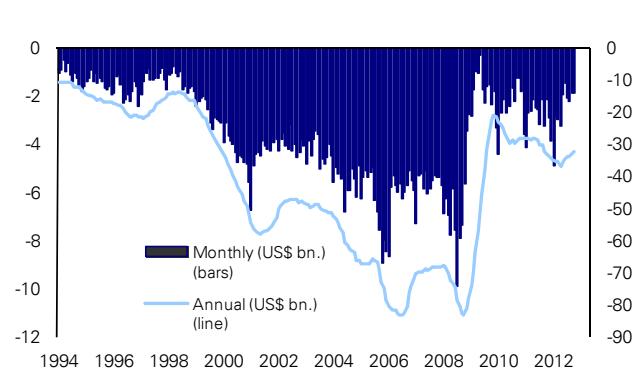
Source: DataStream

**Fig 28: U.S. Trade Balance with Western Europe**

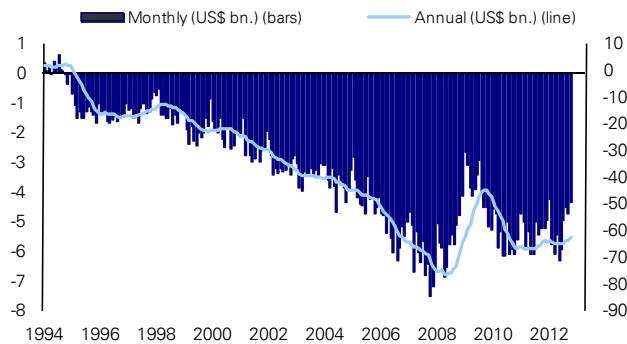


Source: DataStream

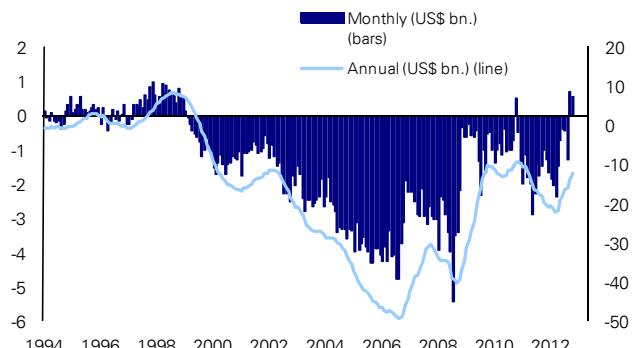
**Fig 29: U.S. Trade Balance with Canada**



Source: DataStream

**Fig 30: U.S. Trade Balance with Mexico**

Source: DataStream

**Fig 31: U.S. Trade Balance with Latin America**

Source: DataStream

## U.S Current-Account Balance Monitor

**Fig 1: U.S. Current-Account Balance**

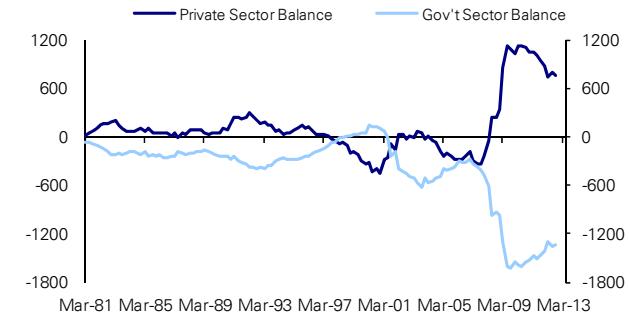
(1980-2010)



Source: DataStream

**Fig 2: U.S. Savings and Investment**

(Private &amp; Government Sector Savings-Investment)



Source: DataStream

**Fig 3: U.S. Current-Account Balance (last 13 quarters) (US\$ Billions)**

	Q3 2009Q4	2009Q1	2010Q2	2010Q3	2010Q4	2010Q1	2011Q2	2011Q3	2011Q4	2011Q1	2012Q2	2012Q3	2012
Balance on Goods	-128.9	-143.3	-152.5	-164.6	-166.9	-161.1	-181.4	-187.2	-180.6	-189.3	-194.3	-185.7	-173.9
Balance on Services	31.4	34.8	34.6	37.0	37.7	41.1	44.1	45.6	45.8	43.0	45.9	48.3	49.4
Bal on Goods & Services	-97.4	-108.5	-118.0	-127.7	-129.1	-120.0	-137.2	-141.5	-134.8	-146.3	-148.4	-137.4	-124.5
Investment Income	34.7	38.1	41.6	47.7	47.8	46.8	52.5	56.2	58.5	59.9	47.4	52.1	50.8
Unilateral Transfers	-32.9	-30.3	-34.7	-31.7	-33.2	-31.5	-35.2	-33.8	-31.8	-32.2	-32.7	-32.7	-33.8
Bal on Current Account (annualized, as % of GDP)	-95.7	-100.7	-111.0	-111.7	-114.6	-104.7	-120.0	-119.1	-108.2	-118.7	-133.6	-118.1	-107.5
	-2.7%	-2.9%	-3.1%	-3.1%	-3.1%	-2.8%	-3.2%	-3.2%	-2.9%	-3.1%	-3.5%	-3.0%	-2.7%

Source: DataStream

**Fig 4: U.S. Current-Account Balance (1998-2010) (US\$ Billions)**

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Balance on Goods	-336.2	-445.8	-421.3	-474.5	-540.4	-663.5	-780.7	-835.7	-818.9	-830.1	-505.9	-645.9	-738.3
Balance on Services	73.0	69.0	59.5	57.1	49.4	58.2	72.1	82.4	122.2	131.8	124.6	145.8	178.3
Bal on Goods & Services	-263.2	-376.8	-361.8	-417.4	-491.0	-605.4	-708.6	-753.3	-696.7	-698.3	-381.3	-500.0	-560.0
Investment Income	11.9	19.2	29.7	25.2	43.7	65.1	68.6	44.2	101.5	147.1	128.0	165.2	221.1
Unilateral Transfers	-50.4	-58.8	-64.6	-65.0	-71.8	-88.2	-105.7	-91.5	-115.1	-125.9	-123.3	-136.1	-134.6
Bal on Current Account (annualized, as % of GDP)	-301.7	-416.3	-396.6	-457.2	-519.1	-628.5	-745.8	-800.6	-710.3	-677.1	-376.6	-470.9	-473.4
	-3.2%	-4.2%	-3.9%	-4.3%	-4.7%	-5.3%	-5.9%	-6.0%	-5.1%	-4.7%	-2.7%	-3.2%	-3.1%

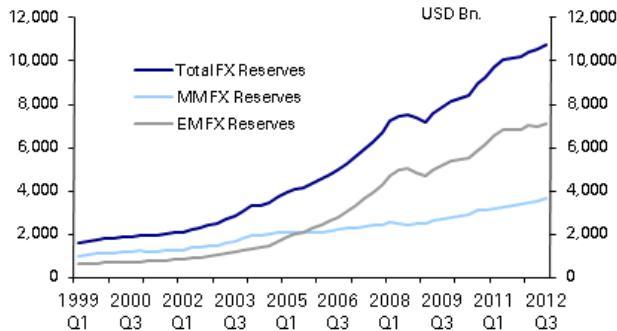
**Fig 5: U.S. Savings-Investment & Net Foreign Investment (1998-2010) (US\$ Billions)**

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Private Savings	1380.2	1376.2	1466.5	1656.8	1749.7	1894.6	1925.4	2079.5	1989.3	2282.7	2569.6	2785.4	2860.6
Private Investment	1641.5	1772.2	1661.9	1646.9	1729.7	1968.5	2172.3	2327.1	2295.2	2087.6	1546.8	1795.1	1916.3
Private-Sector Balance	-261.3	-396.0	-195.4	9.9	20.0	-73.9	-246.9	-247.6	-305.9	195.1	1022.8	990.3	944.3
Gov't Savings	327.8	423.9	229.2	-95.9	-197.1	-155.9	-6.5	116.5	58.3	-374.5	-972.2	-964.9	-896.3
Gov't Investment	287.4	304.3	322.0	343.5	355.8	372.3	392.0	425.1	456.4	497.2	505.4	505.3	483.2
Gov't-Sector Balance	40.4	119.6	-92.8	-439.4	-552.9	-528.2	-398.5	-308.6	-398.1	-871.7	-1477.6	-1470.2	-1379.5
Gross Savings	1708.0	1800.2	1695.7	1560.9	1552.6	1738.7	1918.9	2196.0	2047.7	1908.2	1597.3	1820.4	1964.3
Gross Investment	1928.8	2076.5	1984.0	1990.4	2085.4	2340.9	2564.3	2752.2	2751.7	2584.7	2052.2	2300.4	2399.5
Savings-Investment	-220.8	-276.3	-288.3	-429.5	-532.8	-602.2	-645.4	-556.2	-704.0	-676.5	-454.9	-480.0	-435.2
Statistical Discrepancy	-71.1	-134.0	-103.3	-22.1	16.6	-22.3	-95.1	-242.3	-12.0	-2.4	77.4	0.8	-47.9
Net Foreign Investment	-291.9	-410.4	-391.6	-451.6	-516.1	-624.6	-740.5	-798.4	-716.0	-679.0	-377.4	-479.2	-483.1

Source: DataStream

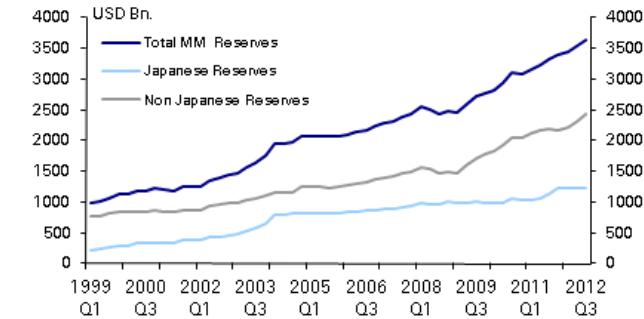
## Central Bank Reserves Currency Composition Monitor

**Figure 1: Official FX reserves have quadrupled reflecting primarily the growth of EM holdings**



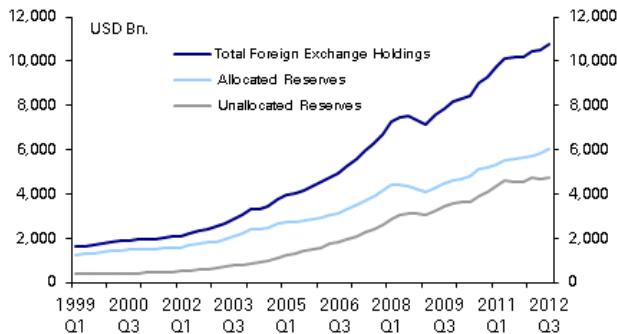
Source: FRB, Census, BEA, DB Global Markets Research

**Figure 2: Mature market (MM) reserves have grown only modestly reflecting valuation & interest**



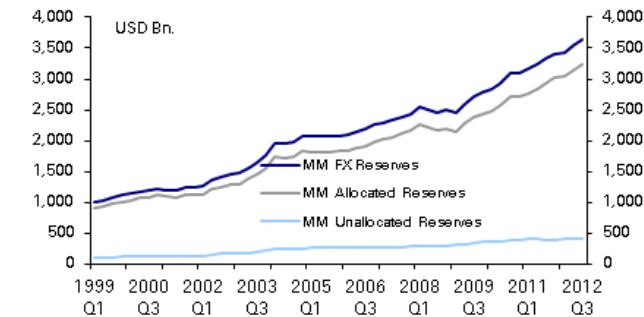
Source: FRB, Census, BEA, DB Global Markets Research

**Figure 3: Many countries report the currency composition of reserves to the IMF, which publishes them in aggregate form**



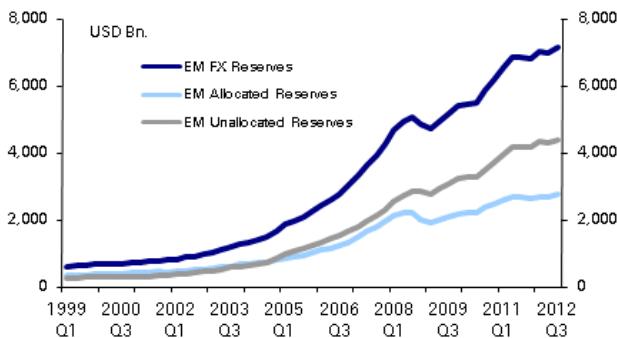
Source: COFER, IMF, DB FX Research

**Figure 4: The advanced countries (MM) all report the composition of reserves to the IMF...**



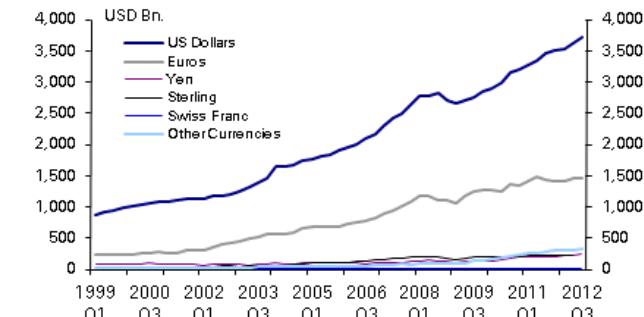
Source: COFER, IMF, DB FX Research

**Figure 5: ...while about half of emerging markets report the currency composition of their reserves**



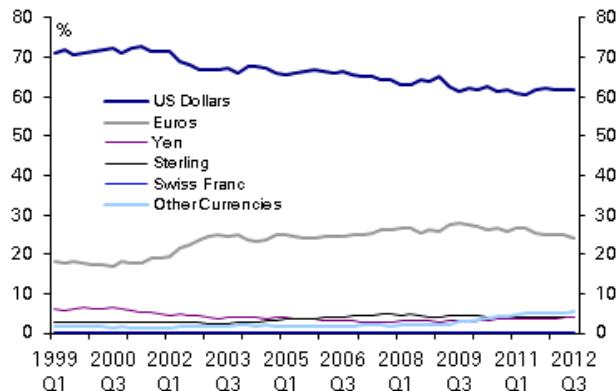
Source: COFER, IMF, DB FX Research

**Figure 6: The currency composition of (114 reporting countries) total FX reserves: levels**



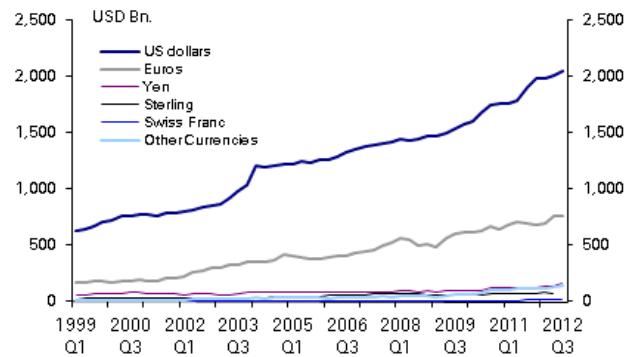
Source: COFER, IMF, DB FX Research

**Figure 7: The USD share in world reserves fell during 2002-04; then stabilized and has now started falling again**



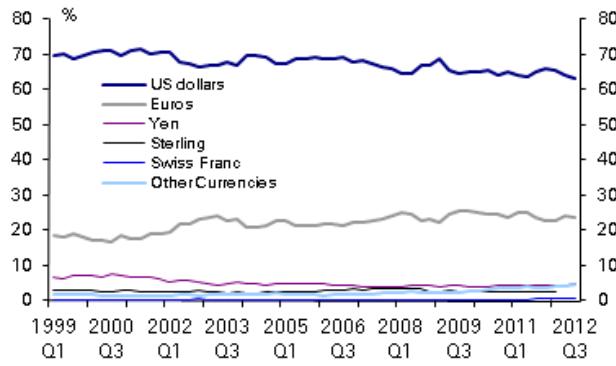
Source: COFER, IMF, DB FX Research

**Figure 8: Advanced country FX reserve holdings...**



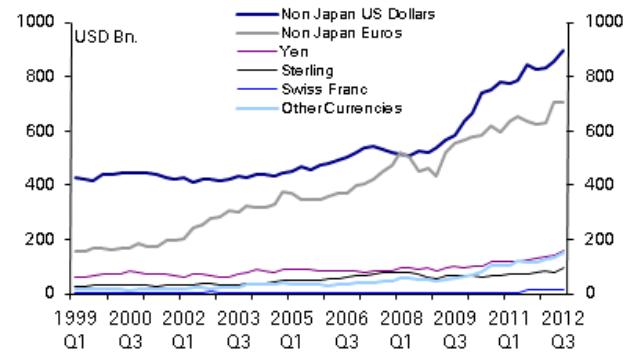
Source: COFER, IMF, DB FX Research

**Figure 9: ...the dollar share in industrial country reserves has been relatively stable**



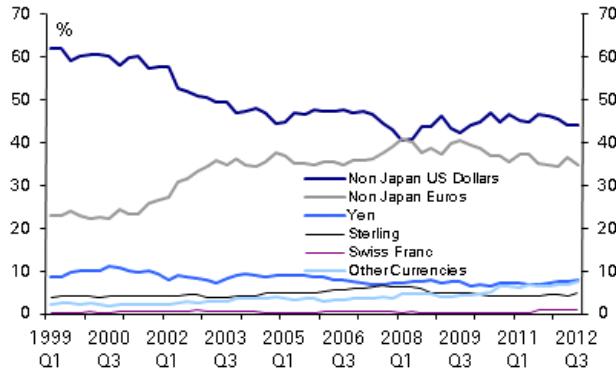
Source: COFER, IMF, DB FX Research

**Figure 10: Ex-Japan (our estimate) industrial country dollar and euro holdings have both risen**



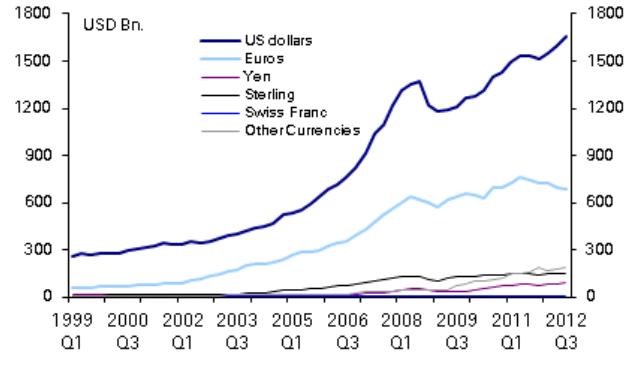
Source: COFER, IMF, DB FX Research

**Figure 11: The share of euros and dollars is not very different**



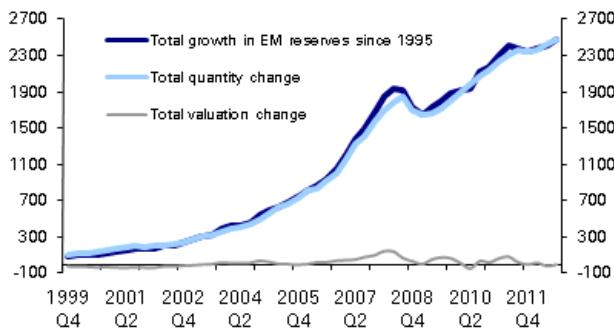
Source: COFER, IMF, DB FX Research

**Figure 12: EM holdings of dollars had climbed steadily**



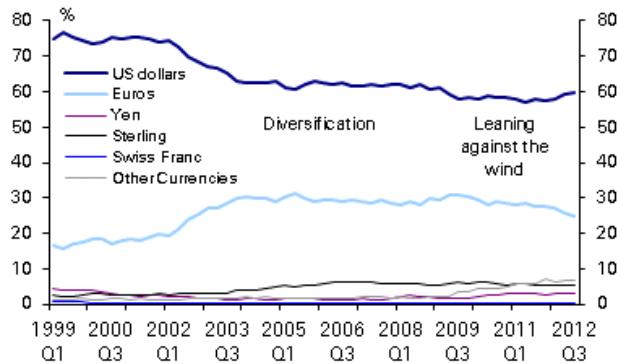
Source: COFER, IMF, DB FX Research

**Figure 13: In EM, the main driver of reserve growth has been intervention (in USD bn)**



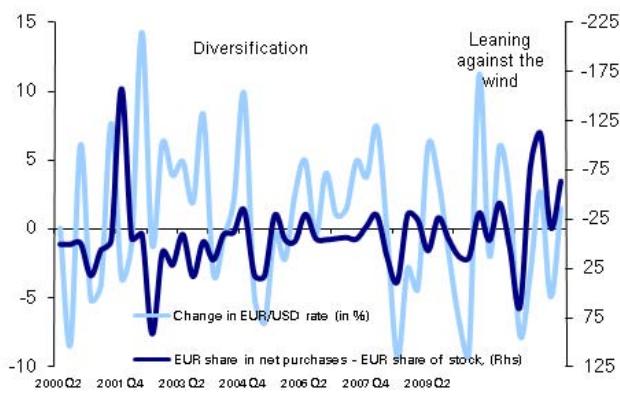
Source: DB FX Research

**Figure 14: In EM, the dollar share fell steadily during 2002-04 then stabilized**



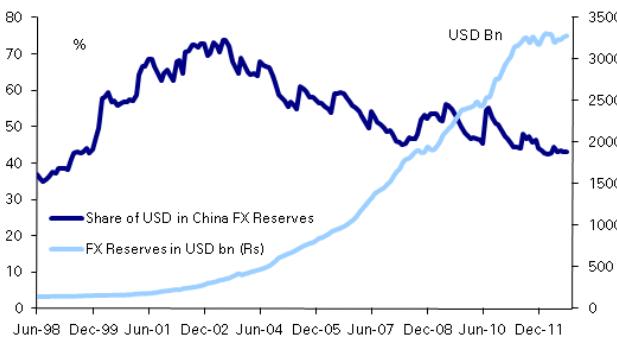
Source: COFER, IMF, DB FX Research

**Figure 15: First active diversification, then leaning against the wind**



Source: COFER, IMF, DB FX Research

**Figure 16: China has steadily diversified away from USD since 2004 (our estimates)**



Source: US TIC data DB FX Research

# Appendix 1

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