

# Currency Weekly

## GBP: Downside risks growing

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### Market focus

pg 2

Earlier in the year there were a number of factors giving sterling support. The Bank of England seemed more concerned about persistent inflation than weak activity data, government fiscal plans seemed on track, and there were signs that M&A inflows were accelerating.

Now, however, the situation for sterling is starting to deteriorate, and the risks for the currency seem increasingly to be on the downside. Widening trade and current account deficits reflect weakening exports which threaten the recovery. In addition, sources of current account financing now look less certain. M&A inflows are slowing and equities have been underperforming. Fixed income inflows have previously been encouraged by confidence in deficit reduction. However, the underlying deficit has started to rise again, and the government will come under increasing pressure to ease policy in the face of weak activity. With the Bank of England in 'wait and see' mode, the downside risks for sterling are growing.

### Recommended trades

pg 9

Short EUR-NOK (entered 21 June 2012). Entry: 7.4990. Take profit: 7.2020. Stop loss: 7.4990 (moved from 7.6660 on 09 Aug 2012).

### Quant indicators

pg 10

Regular updates of our quantitative indicators. This includes an overview of the correlations between all G10 exchange rates; a series of indicators that measure the dominance of the 'risk on – risk off' phenomenon, including new emerging markets RORO analysis; and indices that quantify the market's appetite for risk.

# Market focus

## GBP: Downside risks growing

Sterling has remained firm in recent weeks, trading at close to four year highs against the euro and remaining stable against the dollar. On a trade-weighted basis sterling has now risen 8.5% since its July 2011 lows (charts 1 and 2). However, there are signs that the downside risks for the currency are increasing.

Earlier in the year there were a number of factors giving sterling support. The Bank of England seemed more concerned about persistent inflation than weak activity data, government fiscal plans seemed on track, and there were signs that M&A inflows were accelerating (see '[Sterling's M&A hallmark](#)', 30 April 2012).



Now, however, the situation for sterling is starting to deteriorate, and the risks for the currency seem increasingly to be on the downside. Here we analyse the factors that appear to be turning against Sterling. While they do not as yet constitute an overwhelmingly negative case for the currency, they could easily become the focus of more market attention once the holiday season is over. Those who would be negatively affected by a fall in sterling (we see particular risks against the euro) should consider acting before the market returns to full flow in September.

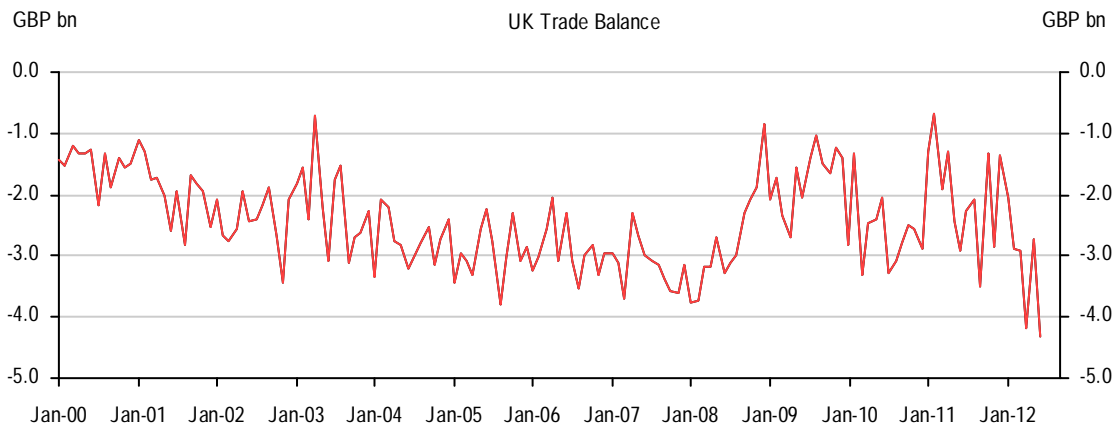
### Record trade deficit – so what?

The UK trade data for June showed a record deficit for trade in goods and services of GBP 4.3bn (chart 3). While a widening trade deficit would not normally be a cause of great concern, the data suggest more worrying underlying problems.

### Export weakness = growth weakness

First, the record deficit comes not from rising imports (which could suggest strengthening domestic demand) but from a sharp fall in exports which suggests that the UK is not immune from the slowdown in global trade. It is not just a problem with exports to the Eurozone. Between Q1 and Q2, exports fell to each of the UK's ten largest trading partners.

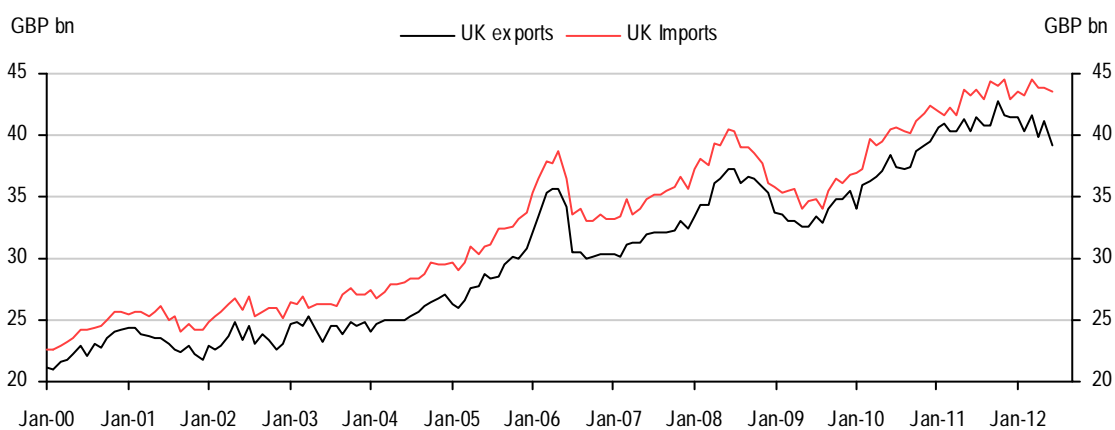
### 3. UK trade deficit reached a record in June...



Source: Bloomberg, HSBC

Chart 4 shows the nominal value of total UK exports and imports since 2000. The recovery in both imports and exports since early 2009 has given way to renewed declines, but the fall in total exports is by far the more pronounced. With domestic demand very subdued, export weakness will make it even harder to produce any recovery in GDP over the coming quarters.

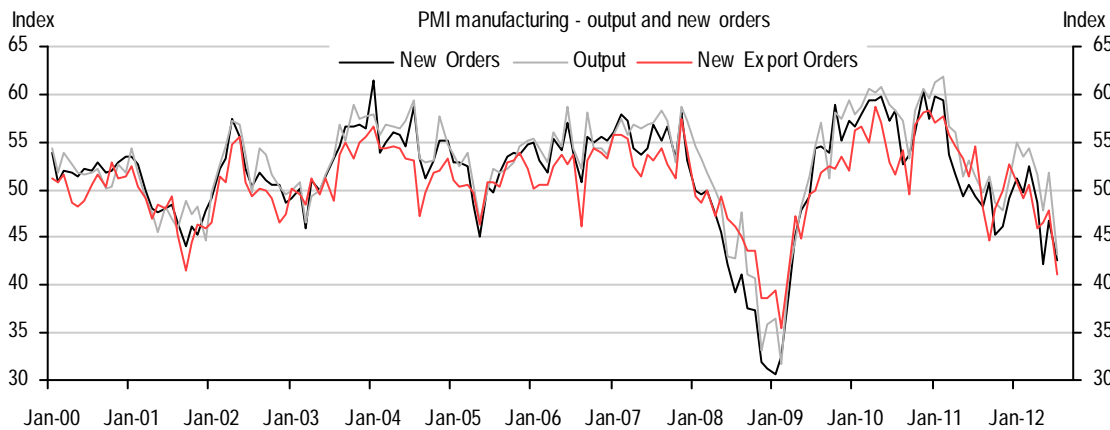
### 4. ...with sharp falls in exports



Source: Bloomberg, HSBC

This does not look like an issue that is going to go away in the near term. Chart 5 shows the manufacturing PMI measures. All are showing weakness, but export order weakness is the most pronounced.

#### 5. Exports orders point to more weakness



Source: Markit, HSBC

#### Widening current account deficit

The growing trade deficit implies that the UK current account deficit will increase further. The deficit in Q1 2012 (the latest available) was GBP 11.2bn, not far short of the record GBP 11.7bn recorded in Q4 2006. Trade data for Q2 show a deficit nearly GBP 4bn larger than in Q1, so the current account deficit for Q2 could be as large as GBP 15bn. Can deficits of this scale continue to be financed without the incentive of a weaker currency?

#### Will the funding be readily available?

In analysing the risks to current account deficit financing it is worth looking through the major sources of funding to see where there may be risks. We do this by considering both longer-term sources (reserve asset acquisition and M&A flows) and shorter-term sources (equity and fixed income flows).

#### Reserve assets

Sterling's share of global foreign exchange reserves has, according to IMF data, been gradually declining since 2007. The most recent data refer to Q1 2012 when sterling accounted for 4% of allocated FX reserves (chart 6). While this was up slightly from Q4 2011, it compares with a peak of 4.7% in 2007. With global FX reserve growth slowing, it seems unlikely that reserve managers will be large incremental buyers of sterling in coming months. At best, this is likely to be a neutral factor.

#### 6. GBP's share of global reserves has been gradually declining since 2007

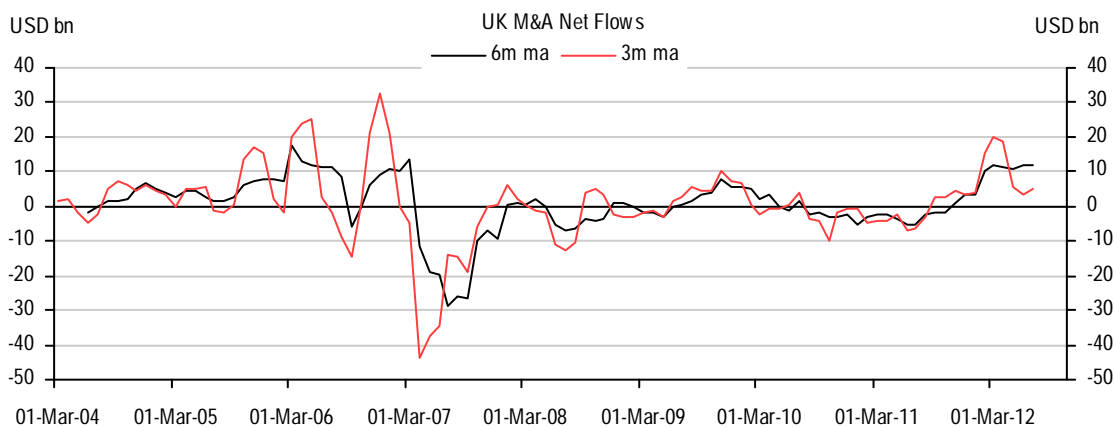


Source: IMF, HSBC

#### M&A inflows weaken

Earlier in the year, there were signs that net M&A inflows into the UK were picking up again and that this could give sterling support. While this may well have been a factor in keeping sterling firm over the past few months, the latest data show a slowing of inflows. Chart 7 shows net M&A inflows based on announced deals reported by Bloomberg, on both a 3 and 6 month average basis. The fall in the three month measure implies that recent inflows have been weaker than earlier in the year. While M&A flows can be very erratic, earlier evidence that this could be a supportive factor for sterling now seems to have fallen away.

#### 7. M&A inflows have weakened again recently



Source: Bloomberg, HSBC

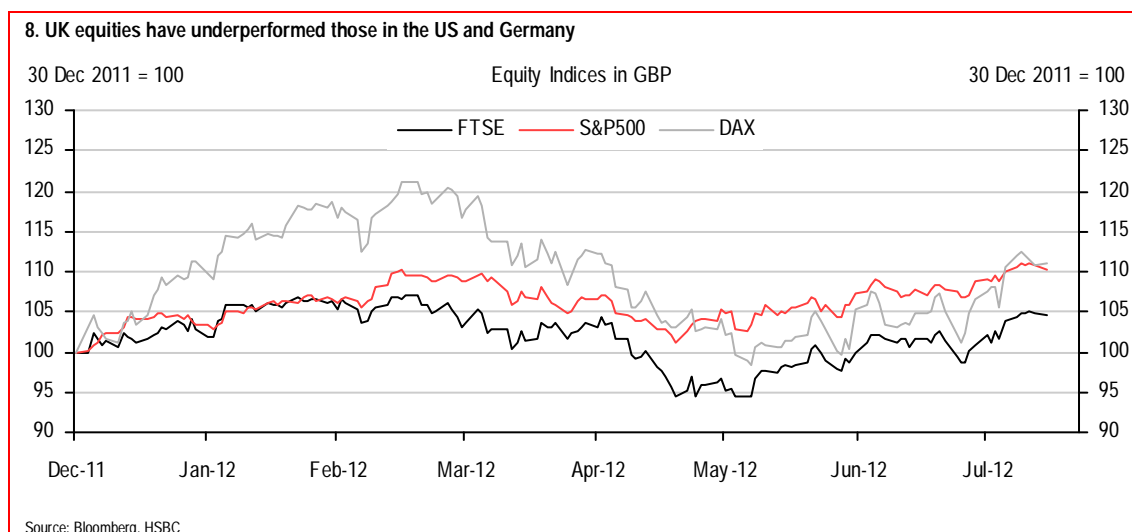
If longer-term sources of capital inflow cannot be relied on to finance a widening current account deficit, what is the evidence on shorter-term portfolio flows?

## Portfolio flows

### Equity underperformance

For an equity investor, the crucial measure of the performance of a market is its total return in domestic currency. Equity investors are far less likely to hedge currency risk than fixed income investors as the return on the underlying assets will already include exposure to the earnings of the companies from abroad. One way of looking at the relative return of UK equities is therefore to measure their performance relative to the performance of other markets expressed in sterling.

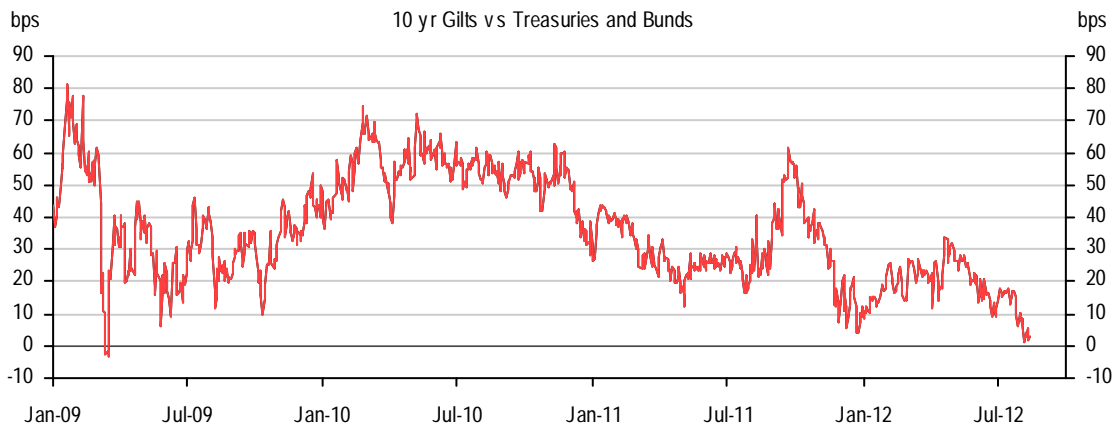
Chart 8 shows the FTSE, S&P500 and DAX all measured in sterling since the beginning of the year. As can be seen, the FTSE has underperformed the other markets by about 5 percentage points over the period. One way of looking at this would be to say that a UK equity investor would have been better off investing overseas than domestically over the period. Equally, overseas investors would have done better in their domestic markets. While the relative performance of these markets may change in the future, there does not seem to be a compelling case for reduced UK equity outflows or increased overseas equity inflows from the relative market performance so far this year.



### Fixed income flows

Fixed income flows are generally the largest part of portfolio flows, and managers tend to be much more active in currency hedging. Two factors give us some cause for concern going forward. First, yield compression on UK gilts has now gone so far that they yield the same at 10 years as the average of Treasuries and Bunds (chart 9). This compares with a spread as high as 60bp last autumn. While high yield will not be a principal reason for holding Gilts, the fact that they now offer very little extra compared with the US and Germany is unlikely to make them newly attractive at the margin.

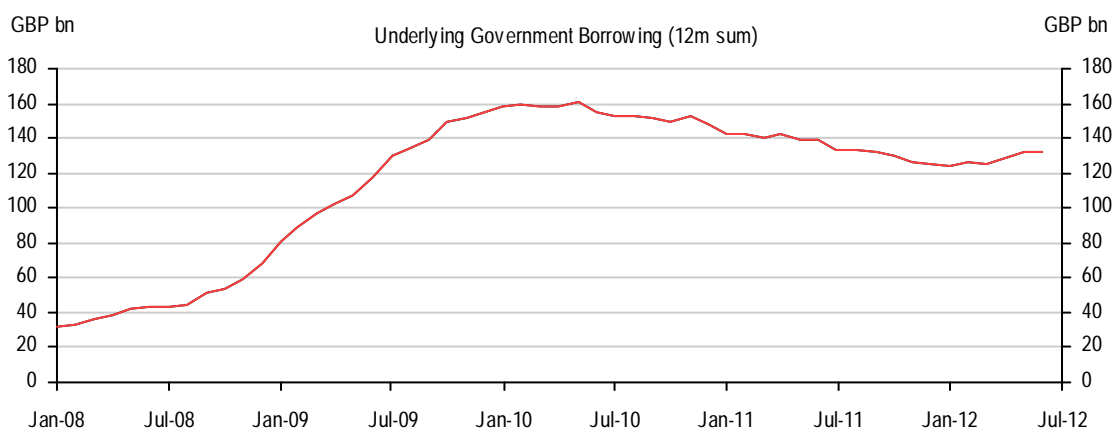
#### 9. Gilt spreads over treasuries and bunds at recent lows



Secondly, and perhaps most importantly, Gilts and sterling have been supported by international investors' belief that the UK government is on track with its deficit reduction programme. A principal plank of the government's economic policy has been that getting the deficit under control is a prerequisite for a return to growth. However, there are signs that this plan is coming under increasing strain.

Headline data on UK public finances have been flattered by both the transfer of Royal Mail Pension Plan assets (GBP 26bn) and by a transfer of GBP 2.3bn from the Bank of England following the closure of its Special Liquidity Scheme. Chart 10 shows a rolling cumulative 12 month sum of underlying government borrowing (excluding financial interventions) adjusting for these distortions. The decline in overall borrowing since 2010 seems to have come to a halt in early 2012, and borrowing is rising again.

#### 10. Deficit reduction plans under threat



With the economy still very weak, upward pressure on spending and downward pressure on tax receipts is likely to continue. On previous occasions, weaker economic prospects have been met by more monetary easing from the Bank of England. This has tended to support sterling on the expectation of better economic activity ahead. Now, however, the Bank seems to be in ‘wait and see’ mode while it assesses both the impact of its previous actions, and the effectiveness of the new ‘Funding for Lending’ scheme which started at the beginning of this month.

Once the politicians return from their summer vacations, the government is going to face renewed pressure to ease fiscal policy in order to support activity. This may raise new questions about the deficit reduction plan, and this could have a negative impact on overseas investors’ appetite for UK fixed income assets. The fact that the labour market has proved resilient in the face of weaker activity may give the government a little more time, but if the discrepancy between activity and employment is resolved by a new rise in unemployment, the pressures on the government will intensify rapidly.

## Conclusion

The factors that seemed to be giving sterling support earlier in the year – BoE hawkishness, fiscal control and M&A inflows – all now seem to be weakening. While this does not yet constitute an overwhelmingly bearish case for sterling, the downside risks for the currency do appear to be growing. We see pressures on the dollar growing as both the presidential election and the ‘fiscal cliff’ get nearer. This suggests the major risks for sterling are against the euro, and we would urge those exposed to the upside in EUR-GBP to consider acting before the market returns to full flow in September.



# Recommended trades

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## Recommended trades

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Position/entry	Take profit	Stop loss	Rationale
<b>Short EUR-NOK</b> Entry: 7.4990 21 June 2012	7.2020	7.4990 (moved from 7.6660 on 09 August 2012)	See ' <a href="#">Trade recommendation: Sell EUR-NOK</a> ' 21 June 2012

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Source: HSBC

# Quant Indicators

In this section, we publish a series of quantitative indicators that summarise current market conditions. Below, we provide an overview of these indices and explain what they are currently telling us about the state of the market.

## 1. RORO: Risk on – risk off indices (pg 11)

### (a) RORO Index

The HSBC RORO index measures the extent to which the risk on – risk off paradigm is driving markets. A high level of the index indicates that risk on – risk off is dominant and correlations are high across many different assets. In addition to the RORO index, we also measure the extent to which different assets and regions are driven by the risk on – risk off phenomenon rather than asset or region-specific factors.

At present, **the RORO Index is at extremely high levels.** This indicates that the risk on – risk off phenomenon continues to dominate markets. **The USD is the most risk-off currency.**

### (b) Emerging Market RORO Indices

The EM RORO indices measure the strength of regional correlations in Asia, Latin America and EMEA. Strong correlation in a particular region could be the result of RORO driving synchronized moves in that region, or the result of local phenomena. To separate the two effects, we measure the extent to which correlations in the different regions are driven by risk on – risk off rather than local factors.

**Regional correlations within EM are at moderate levels.**

### (c) Equity RORO Index

The Equity RORO index measures the strength of correlations within the main “risky” asset class of equities. **The Equity RORO Index is high by historical levels.**

## 2. OPRA: Position-based risk appetite index (pg 17)

The OPRA index measures risk appetite based on the positions held in contracts with varying degrees of risk by speculative traders on US futures exchanges. The OPRA index is **in neutral territory**, which means that speculative traders have shifted their positions in a way unrelated to the risk of holding them.

## 3. MRAI: Price-based risk appetite index (pg 18)

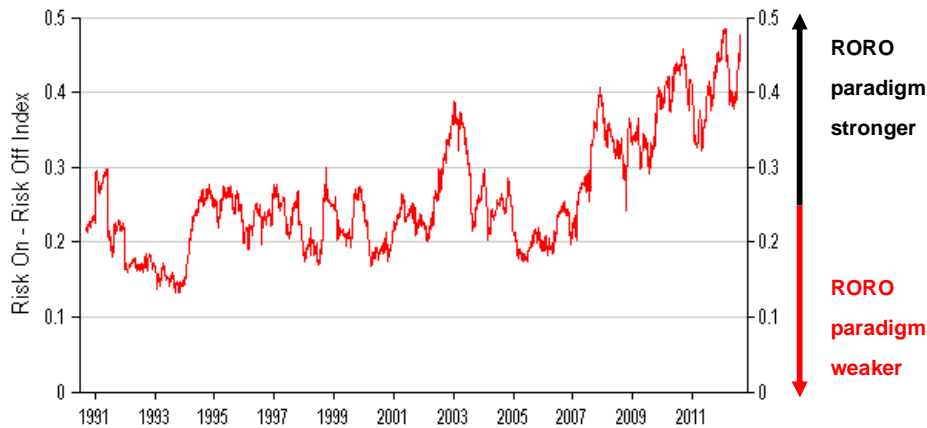
The MRAI measures risk appetite based on changes in the price and volatility of several assets that are known to be strongly affected by the market’s appetite for risk. The index **has moved sideways with high volatility since May 2010.** This is indicative of **neutral risk appetite** and consistent with the RORO phenomenon.

## 4. Correlation: G10 exchange rates (pg 19)

We show the strength of the correlations between all G10 exchange rates. This highlights currency pairs that move independently or in the same (or opposite) direction.

## HSBC Risk On – Risk Off Index

Risk On – Risk Off Index



Source: HSBC, Bloomberg

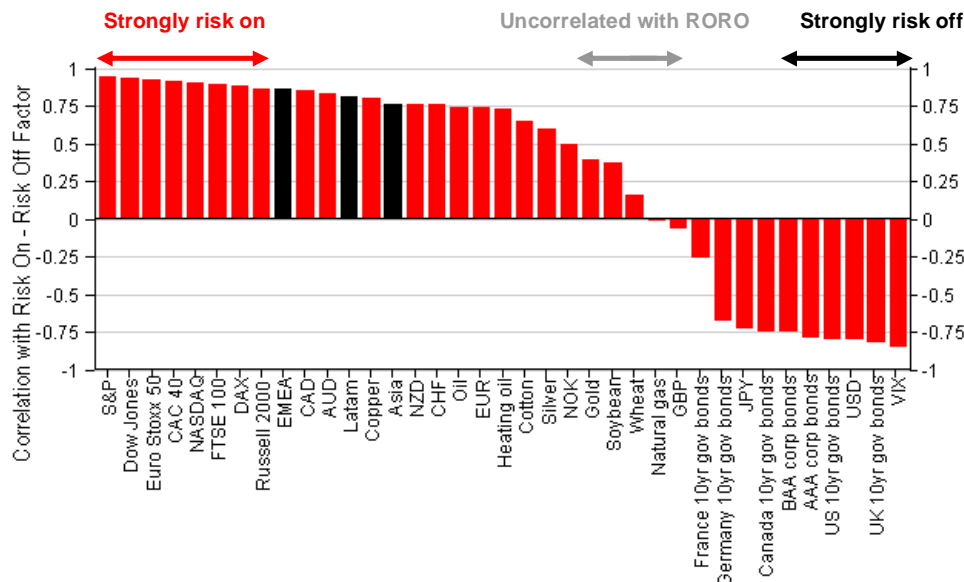
### RORO Index

The RORO index has risen sharply and is back at extremely high levels.

This indicates that the risk on – risk off phenomenon continues to dominate markets.

See Appendix A1 for more details of the methodology.

Asset correlations with the risk on – risk off factor



Source: HSBC, Bloomberg

### RORO Correlations

The assets that were most highly correlated with the risk on – risk off factor during the previous 20 weeks were:

#### Risk-on assets

- ▶ S&P
- ▶ Dow Jones

#### Risk-off assets

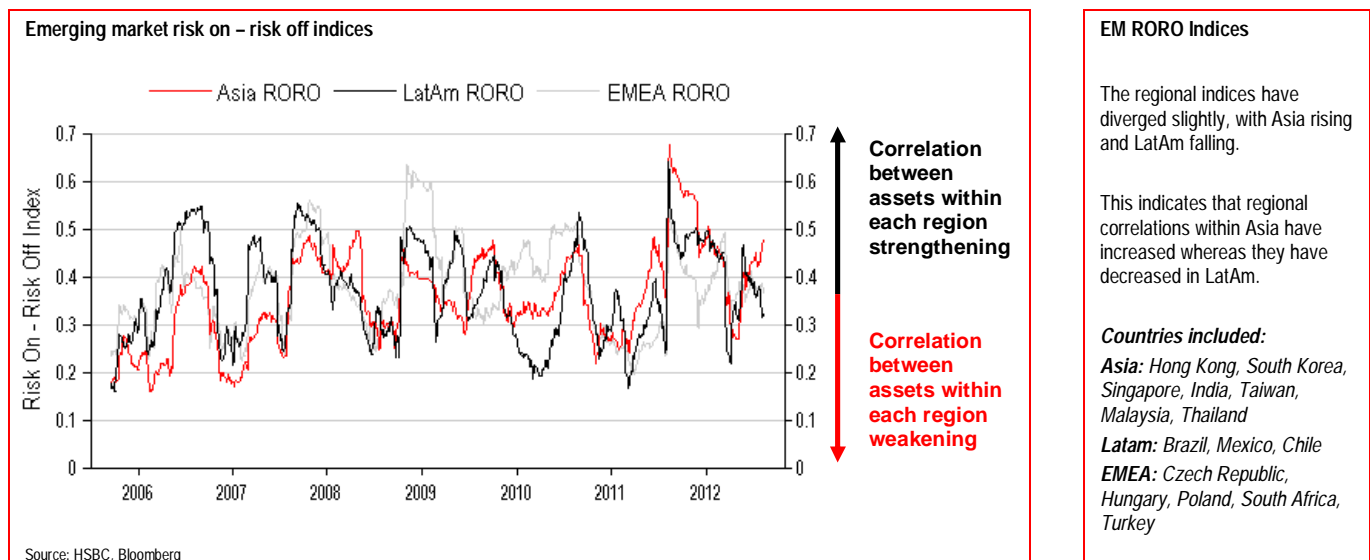
- ▶ VIX
- ▶ UK government bonds

#### Uncorrelated with RORO

- ▶ Natural gas
- ▶ GBP

EM regions are all strongly correlated with RORO. However, EMEA is slightly more strongly correlated to RORO than Asia or Latam.

## HSBC Emerging Market RORO Indices



### Interpretation

Risk on – risk off is a truly global phenomenon that drives returns and causes high correlations across many different markets and geographic regions. However, there can still be variations in the strength of correlations between assets from different markets, as well as differences in the extent to which these correlations are driven by risk on – risk off rather than region-specific factors.

To quantify the strength of correlations in different emerging markets, we construct three EM RORO indices (shown in the chart above). A high index level indicates strong correlations between assets in that region. For example, when the Asia RORO index is high this implies that a single factor is driving returns across Asia, which leads to strong correlations between Asian assets. Similarly, high levels of the Latam and EMEA RORO indices imply that correlations are high in Latin America and EMEA, respectively.

Strong correlations between assets in different regions can be caused by local phenomena as well as global RORO dynamics. To illustrate the importance of risk on – risk off rather than local factors in driving correlations, in the bar chart on the previous page we show the extent to which the different regions are driven by the RORO factor. When a region is strongly driven by risk on – risk off, it will have a high correlation with the RORO factor and will appear to the left of the bar chart. On the other hand, if regional correlations are not primarily driven by risk on – risk off, but instead by other local factors, a region will be only weakly correlated with the RORO factor.

### The picture today

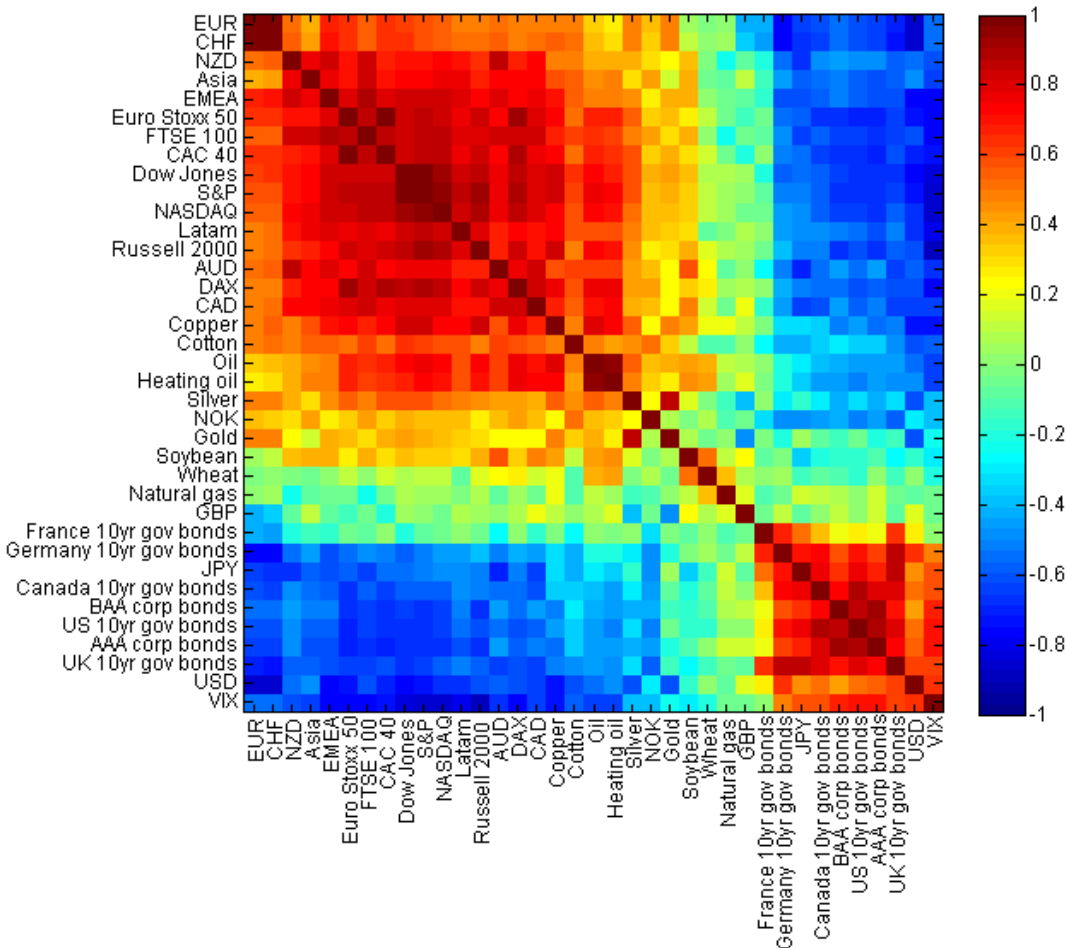
Correlations within Asia have risen recently, whereas correlations within LatAm have recently fallen.

### Methodology

See Appendix A2 for more details of the construction methodology.

## Correlation heat map

Heat map showing correlations over the last 80 days



Source: HSBC, Bloomberg

### Reading the heat maps

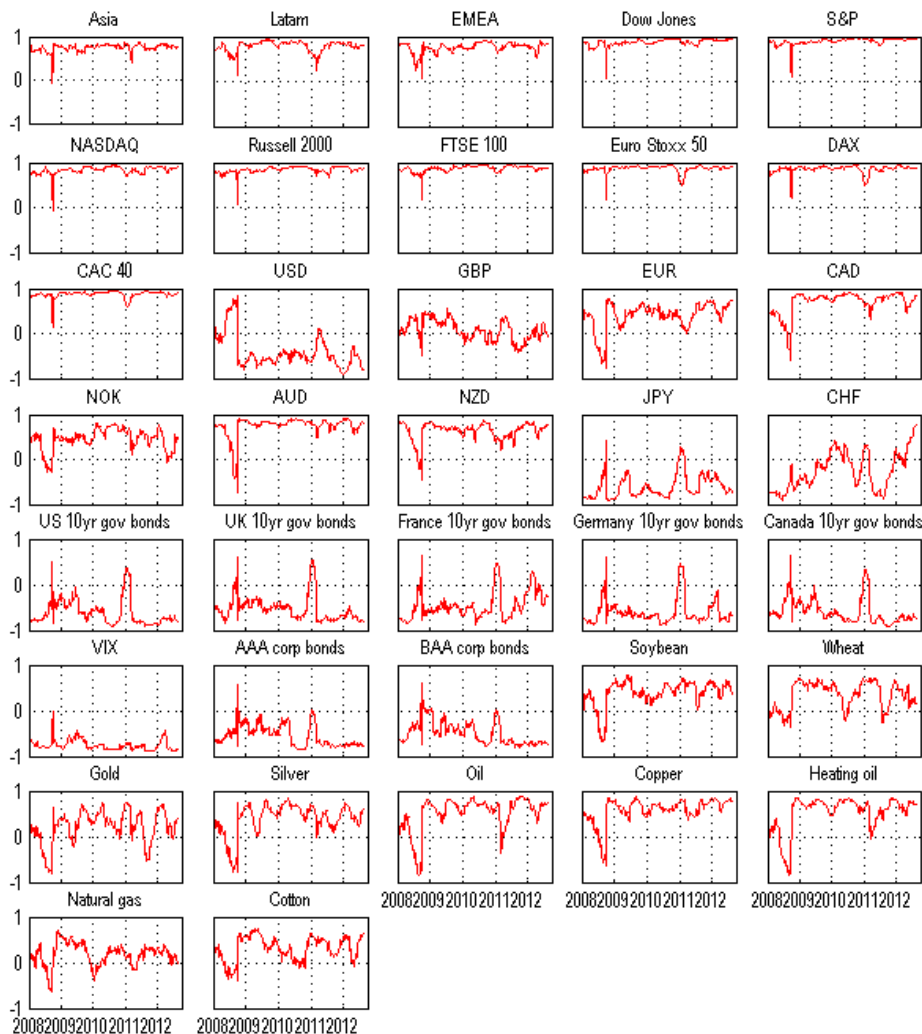
The heat map shows the correlations between different assets during the last 80 days. **Dark red** regions indicate **strong positive** correlations. **Dark blue** regions indicate **strong negative** correlations. **Yellow** and **green** regions indicate **weak correlations/uncorrelated** assets.

### The picture today

The heat map illustrates that **the risk on – risk off phenomenon remains strong**. There are two large red blocks corresponding to a group of highly correlated risk-on assets and another group of highly correlated risk-off assets. The blue regions show the negative correlations between strongly risk-on and strongly risk-off assets, eg the S&P and the JPY. There are some green areas (weak correlations), which indicate that a few assets have recently moved independently of the risk on – risk off phenomenon.

## Correlations with the risk on – risk off factor through time

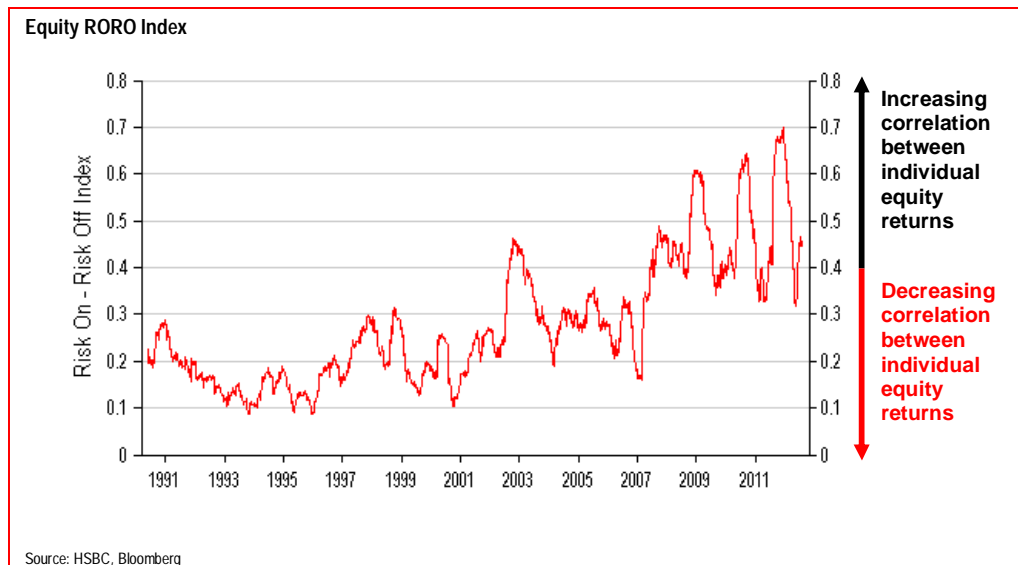
Rolling correlations of individual assets with the risk on – risk off factor



Source: HSBC, Bloomberg

The charts show the strength of the correlations between individual assets and the risk on – risk off factor through time. **These correlations quantify the extent to which the different assets are driven by risk on – risk off.** A correlation close to 1 implies that the asset is strongly risk on; a correlation close to -1 implies that the asset is strongly risk off; and a correlation near zero suggests that the asset is not primarily driven by the risk on – risk off phenomenon.

## HSBC Equity RORO Index



### EM RORO Indices

The Equity RORO index has risen sharply in recent weeks. Whilst lower than the all-time highs seen in late 2011, it is high by historical levels.

This indicates that whilst equity moves remain highly correlated, there is significantly more dispersion than in late 2011.

*See Appendix A3 for more details of the methodology.*

## Interpretation

Whilst risk on – risk off is inherently a cross-asset phenomenon, equities are the quintessential risk-on asset. When there is a perception in the market that correlations are high, it is important to determine whether it is simply a within-asset-class phenomenon or part of the wider global macro theme.

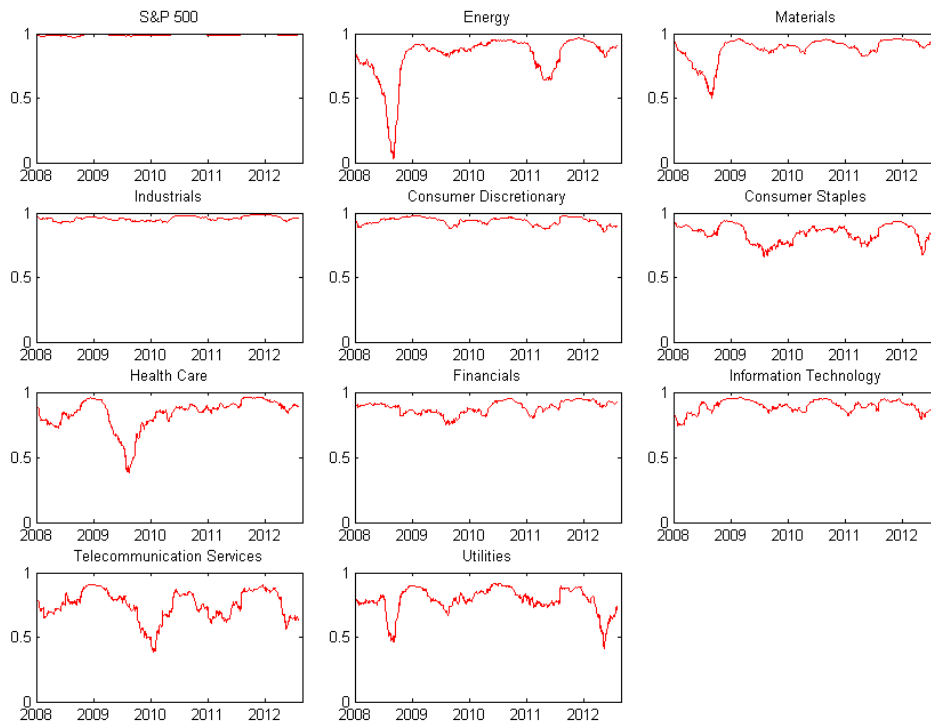
The HSBC Equity RORO Index allows us to distinguish between high correlations which are specific to this main “risky” asset class and high cross-asset correlations, as measured in the original RORO Index, which indicate broader macro stress.

## The picture today

At the moment the **Equity RORO Index is high by historical levels**, albeit at lower levels than the all-time highs seen in late 2011. This indicates that movements in individual equities remain very similar.

## Correlation of sectors with Equity RORO factor

Rolling correlations of individual sectors with Equity RORO factor



Source: HSBC, Bloomberg

These charts show the rolling correlations between the returns of individual equity sectors and the Equity RORO factor. Values close to +1 indicate that the sector is simply moving in response to changes in the Equity RORO factor. The closer the value is to 0, the more that sector is displaying sector-specific character.

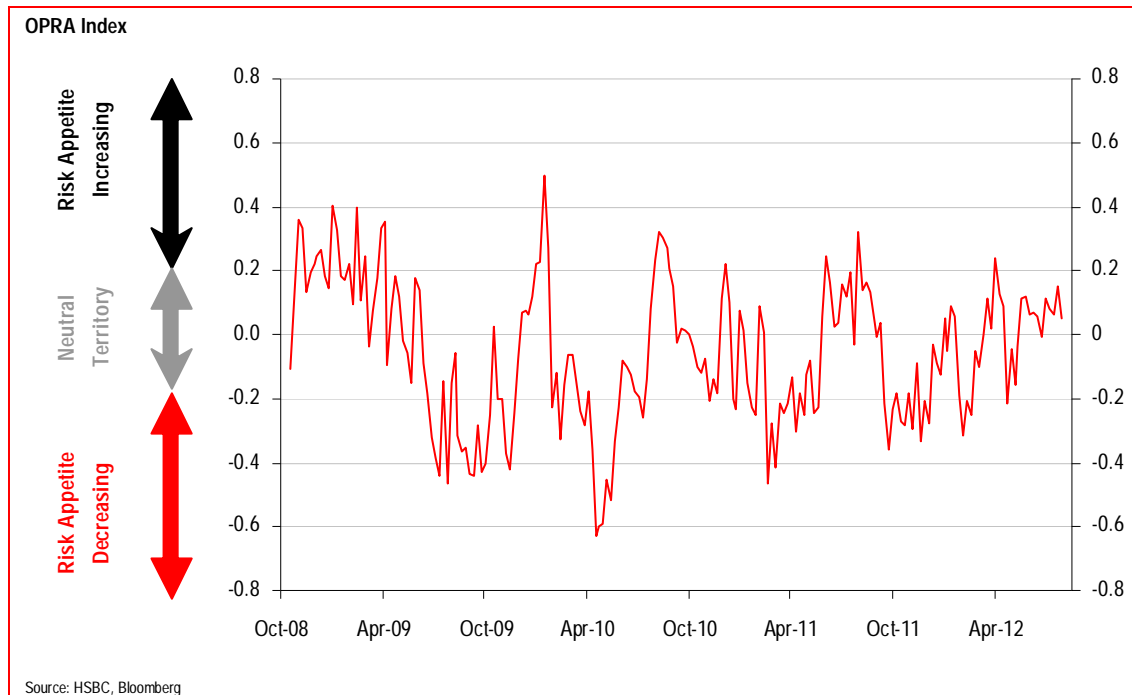
### Interpretation

Most sectors are now showing high correlations to the Equity RORO factor. This is consistent with the recent rise in the Equity RORO index.

**Most sectors remain strongly correlated to the Equity RORO factor by historical standards.**



## OPRA



### Interpretation

When the OPRA index is close to 1 it indicates that speculators have increased their exposure to risky assets, whereas a value close to -1 indicates that speculators have shifted their exposure to less risky assets.

### The picture today

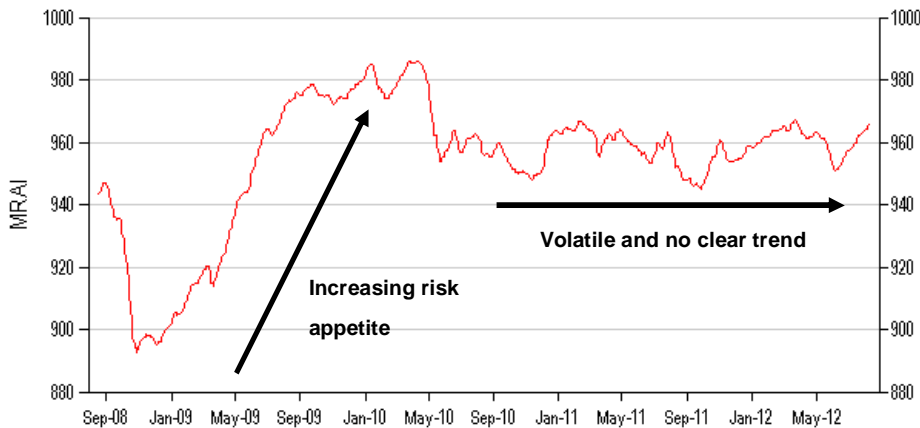
The position-based risk appetite index is **in neutral territory**. This means that speculative traders on the US futures exchanges have shifted their positions in a way unrelated to the risk of holding them. This is indicative of **neutral risk appetite**.

### Methodology

*The OPRA index is based on the relationship between changes in the futures positions held by speculative traders in various contracts and the risk associated with holding the contracts. See Appendix B for more details of the methodology.*

## MRAI

MRAI: Short-term picture



Source: HSBC, Bloomberg

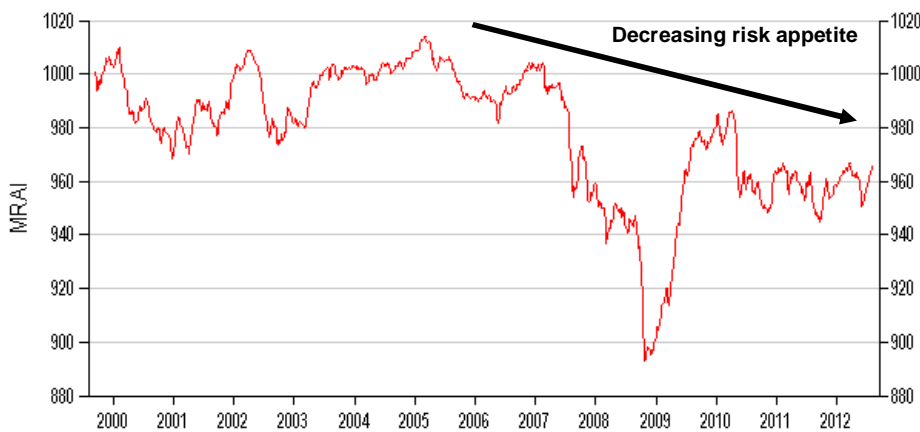
Short-term picture

The price-based risk appetite index has moved sideways with high volatility since May 2010.

This index is based on changes in prices and volatilities of assets that are known to be affected by risk appetite.

See Appendix C for more details of the methodology.

MRAI: Long-term picture



Source: HSBC, Bloomberg

Long-term picture

The MRAI is in a long-term downward trend.

## Interpretation

A positive trend in the MRAI implies increasing risk appetite whereas a negative trend implies decreasing risk appetite.

## The picture today

The MRAI has been volatile and has shown no clear trend since May 2010. This indicates that **there is constantly changing appetite for risk**, which is consistent with the risk on – risk off phenomenon.

## G10 Exchange Rate Correlations

In the linked document at the following url

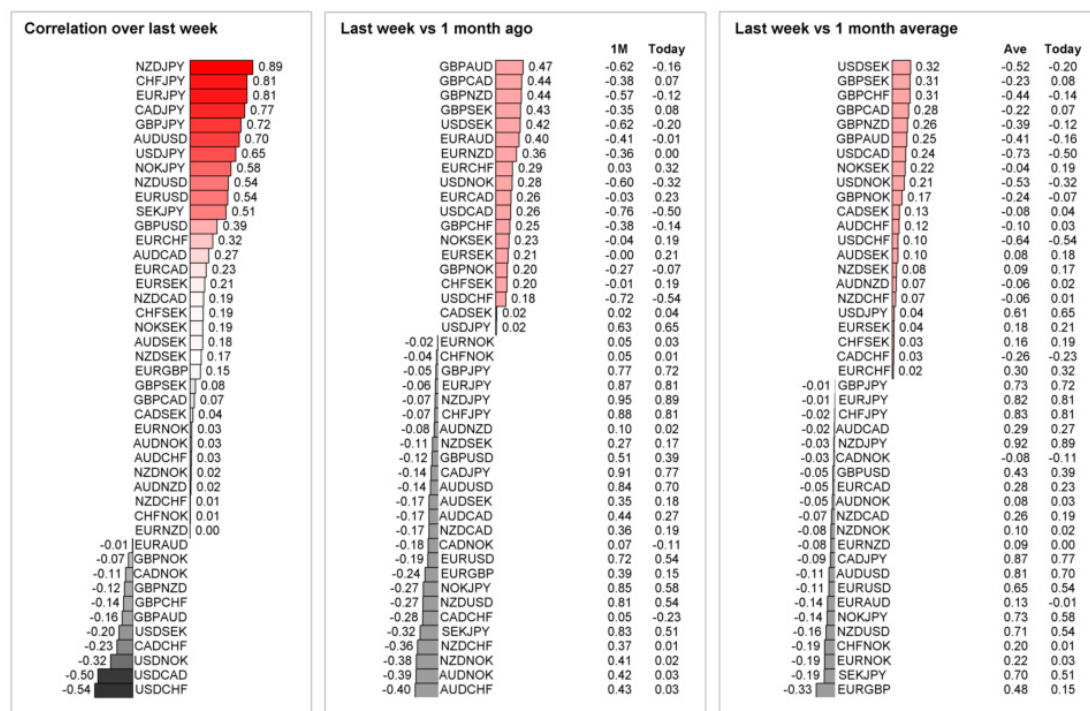
(<https://www.research.hsbc.com/midas/Res/RDV?p=pdf&key=6WzQwlFszb&n=339911.PDF>), we show the strength of the correlations between all G10 exchange rates. If one has a view on how an exchange rate is going to move, this can be used to identify other trading opportunities by highlighting other currency pairs that move independently or in the same (or opposite) direction.

The chart below is an example page from this document for AUD-JPY. The three bar charts show:

- ▶ The correlation of AUD-JPY with all other G10 crosses during the previous week;
- ▶ A comparison of AUD-JPY correlations during the previous week with a 1-week period 1-month ago; and
- ▶ A comparison of last week's AUD-JPY correlations with the average correlation during the previous month.

To enable us to calculate correlations over periods as short as a week, we have used hourly price data. In the linked document, we provide similar charts for all other G10 crosses and more details of the methodology that we use to construct the charts.

Example page from the linked correlation document: AUD-JPY correlations over the last week and versus the previous month



Source: HSBC

# Appendix A1: RORO Methodology

## Market-wide correlation index

### HSBC Risk On – Risk Off (RORO) Index

The Risk On – Risk Off (RORO) index takes the rolling correlations between the daily returns of the 34 assets listed in the table below and combines them into a single index. We construct the index by using principal component analysis (PCA) to decompose the 34 asset return time series into 34 principal components (PCs), which are mutually uncorrelated variables that explain the observed asset returns.

The first PC represents the most important factor driving financial markets during a particular time period. In current market conditions, this factor can be considered to represent “risk on – risk off”. That is, the paradigm in which the market either believes the future is bright – “risk on” – or that it is bad – “risk off”. The proportion of the variance explained by the first PC then provides an indication of the strength with which this paradigm dominates markets. If the first PC dominates markets and explains a large proportion of the variance, this implies that market-wide correlations are strong, which is a key feature of the risk on – risk off paradigm. In this scenario, this single factor is driving synchronized changes amongst many different markets; hence correlations are high.

We define the RORO index as the variance in market returns explained by the first PC. An increase in the RORO index implies an increase in market correlations, whereas a decrease implies that market correlations have decreased. In constructing the index we focus on markets that have a large overlap in trading hours (Europe and North America and Asian currency markets). This enables us to track correlations on a daily basis without having to worry about the non-synchronicity of return time series.

We also consider correlations between the different assets and the risk on – risk off “factor”. These are the correlations between the different return time series and the first PC, and can also be considered to provide an indication of the extent to which risk on – risk off is driving different assets.

#### Assets included in the RORO Index

Equities	Government bonds (10 year yields)	Corporate bonds (yields)	Currencies (trade weights indices)	Metals	Other
S&P	US	AAA	USD	Gold	VIX
Dow Jones	Canada	BAA	EUR	Silver	Oil
NASDAQ	UK		CHF	Copper	Natural Gas
Russell 2000	Germany		GBP		Heating Oil
FTSE 100	France		JPY		Wheat
Euro Stoxx 50			AUD		Soybean
DAX			CAD		Cotton
CAC 40			NZD		

Source: HSBC

# Appendix A2: EM RORO

## Regional emerging market correlations

### HSBC Emerging Market RORO Indices

We produce Emerging Market RORO Indices for Asia, Latin America, and EMEA. We construct the indices using a similar methodology to that described in Appendix A1 for the cross-asset RORO index. For each region, we perform a principal component analysis (PCA) on the returns of a range of assets from that region. We then define each regional index as the proportion of the variance in the returns of assets in that region explained by the first principal component (PC).

For the original multi-asset RORO Index the first PC represents the most important global macro factor driving returns across a wide range of different assets. When the RORO index is high, this factor is strong. The regional EM indices have an analogous interpretation. For example, when the Asia RORO index is high this implies that a single factor is driving returns across Asia, which leads to strong correlations between Asian assets. Similarly, high levels of the Latam and EMEA RORO indices imply that correlations are high in Latin America and EMEA, respectively.

For each of the regions, we use both bond and equity data for the countries listed in the table below. To enable us to compare the regional indices, we use weekly price data to eliminate any effects due to the different time zones. This also allows us to compare these indices to the cross-asset RORO. We consider the correlation between the dominant market factor in the different regions and the main risk on – risk off factor that we identify in our cross-asset analysis. This is the correlations between the first PC for each region and the first PC for the cross-asset returns. The strength of these correlations can be considered to provide an indication of the extent to which risk on – risk off is driving returns in the different regions.

#### Assets included in the EM RORO Indices

Asia	Latin America	EMEA
Hong Kong	Brazil	Czech Republic
South Korea	Mexico	Hungary
Singapore	Chile	Poland
India		South Africa
Taiwan		Turkey
Malaysia		
Thailand		

Source: HSBC

# Appendix A3: Equity RORO

## Equity market correlations

### HSBC Equity RORO Index

The HSBC Equity RORO Index looks at all current members of the S&P 500 Index that have an appropriate data history back to 1 January 1990. We use a similar construction methodology for this index to the one described in Appendix A1 for the RORO Index.

To construct the Equity RORO Index we perform a principal component analysis (PCA) on the returns of all of the equities that we consider. We define the index as the proportion of the variance in the returns of these equities that can be explained by the first principal component (PC).

This first PC is the most important factor driving the returns at any time. For the original multi-asset RORO Index the first PC represents the most important global macro factor driving returns across a wide range of different assets. When the RORO index is high, this factor is strong.

For the Equity RORO, there is an analogous interpretation; however, in this case we are only looking at the risky asset class of equities. When the Equity RORO index is high it indicates there is a “supercharged” market beta dominating stocks – correlations are high and individual identity is reduced.

We use the two indices together to characterise the stress in the global macro environment. High correlations are generally an indication of market strain and have consequences for most asset classes. The two indices help understand the extent to which stress is confined to risky assets or is more comprehensive.

# Appendix B: OPRA Methodology

## Position-based risk appetite index

### Open Positions Risk Appetite (OPRA) Index

We use speculative positions from the CFTC Commitments of Traders report to measure risk appetite. We track changes in exposure of the speculative community to the various contracts listed in the table below and relate these changes to the risk associated with the contracts.

We view it as a sign of high risk appetite when the speculative community has increased its exposure to the more risky assets more than for less risky assets. To measure this we calculate the rank correlation between changes in the speculative open interest and volatility. A rank correlation is used since this is less susceptible to outliers than a standard correlation.

Since this is a correlation, the index will lie between -1 and +1. A value close to +1 indicates that speculators have been increasing their positions in risky assets across the board, with the largest percentage increase in exposure being in the riskiest assets. A value close to the minimum value of -1 indicates the opposite. If speculative positions have been changing in a way unrelated to risk, then the value of this index will be close to zero.

#### Contracts included in OPRA Index

Agricultural	Drinks	Metals	Currencies	Oil	Other
Corn	Cocoa	Platinum	AUD	LSCrude	Lumber
Oats	Coffee	Silver	CAD	Unleaded	
Rough Rice	OJ	Copper	CHF	Heating Oil	
Soybeans			EUR	Natural Gas	
Soybean Oil			GBP		
Soybean Meal			JPY		
Wheat					
Cotton					
Lean Hogs					
Live Cattle					

Source: HSBC

# Appendix C: MRAI Methodology

## Price-based risk appetite index

### Market Risk Appetite Index (MRAI)

The MRAI measures the aggregate level of risk appetite in the financial system using risk premia from various markets. The index is based on changes in price and volatility of several assets that are known to be strongly affected by risk appetite. A positive trend in the MRAI implies an increasing appetite for risk whereas a negative trend in the MRAI implies a decreasing appetite for risk.

We construct the index using equally weighted z-scores of changes in the level of six inputs: the VIX and VDAX volatility indices; the Global Hazard Index, which aggregates the 3-month implied volatilities for EURUSD, USDJPY, and EURJPY; BAA and AAA corporate bonds spreads; and interest rate swap spreads.



# Disclosure appendix

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