Is FX Volatility Dead?

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Is the decline in FX volatility structural or cyclical?

- Cyclical factors
  - Global convergence in interest rates

- Structural factors
  - Increased credibility of central banks has reduced the long term risk premia
  - Globalisation of trade and financial markets
  - Growth in central bank reserves

- Catalysts for a temporary spike in volatility
  - US recession? Equity volatility is countercyclical but FX volatility is not
  - Unwinding of extreme market positions that temper volatility selling
  - Reduction in the number of liquidity providers
Cyclical factors: Global convergence in interest rates

- Since 1998 G3 FX vols have fallen from 13.0 to 7.5.
- Convergence in global rates – standard deviation is forecast to fall from 2.1 to 1.6 by the end of 2007 – will contribute to a reduction of FX volatility.
- Positive correlation between the level of G10 rates and FX volatility has broken down since 2000.

G10 Interest rates will converge further in 2007

<table>
<thead>
<tr>
<th>Country</th>
<th>Official Rates: Current</th>
<th>Official Rates: Dec-07 (f)</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>5.25%</td>
<td>4.75%</td>
</tr>
<tr>
<td>Eurozone</td>
<td>3.25%</td>
<td>3.75%</td>
</tr>
<tr>
<td>Japan</td>
<td>0.25%</td>
<td>1.50%</td>
</tr>
<tr>
<td>UK</td>
<td>5.00%</td>
<td>4.50%</td>
</tr>
<tr>
<td>Canada</td>
<td>4.25%</td>
<td>4.00%</td>
</tr>
<tr>
<td>Australia</td>
<td>6.25%</td>
<td>6.25%</td>
</tr>
<tr>
<td>New Zealand</td>
<td>7.25%</td>
<td>6.00%</td>
</tr>
<tr>
<td>Sweden</td>
<td>2.75%</td>
<td>3.75%</td>
</tr>
<tr>
<td>Norway</td>
<td>3.25%</td>
<td>4.50%</td>
</tr>
<tr>
<td>Switzerland</td>
<td>1.75%</td>
<td>2.25%</td>
</tr>
<tr>
<td>Minimum (Maximum)</td>
<td>0.25% (7.25%)</td>
<td>1.50% (6.25%)</td>
</tr>
</tbody>
</table>

Source: RBC Capital Markets, Bloomberg

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Structural factors: Increased central bank credibility

- The “Great Moderation” ended in the 1980’s.
- But inflation targeting started in the 1990’s and global inflation targets are now centred around 2%.
- Central bank credibility has increased through greater transparency of inflation targets, policy bias, the publication of central banks interest rate projections, and the shift towards gradualism.
- G20 Finance Ministers talk about the undesirability of “excess volatility and disorderly movements in exchange rates”

<table>
<thead>
<tr>
<th>Country</th>
<th>Date Introduction</th>
<th>Target Type</th>
<th>Inflation Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>“Price stability”</td>
<td>Core inflation</td>
<td>1-2%</td>
</tr>
<tr>
<td>Eurozone</td>
<td>January 1999</td>
<td>HICP</td>
<td>&lt; 2.0%</td>
</tr>
<tr>
<td>Japan</td>
<td>May 2006</td>
<td>CPI</td>
<td>&lt; 2.0%</td>
</tr>
<tr>
<td>UK</td>
<td>October 1992</td>
<td>HICP</td>
<td>&lt; 2.0%</td>
</tr>
<tr>
<td>Canada</td>
<td>February 1991</td>
<td>CPI</td>
<td>1.0-3.0%</td>
</tr>
<tr>
<td>Australia</td>
<td>April 1993</td>
<td>CPI</td>
<td>2.0-3.0%</td>
</tr>
<tr>
<td>New Zealand</td>
<td>March 1990</td>
<td>CPI</td>
<td>1.0-3.0%</td>
</tr>
<tr>
<td>Sweden</td>
<td>January 1993</td>
<td>CPI-UNDIX</td>
<td>2.0±1%</td>
</tr>
<tr>
<td>Norway</td>
<td>March 2001</td>
<td>CPI-ATE</td>
<td>&lt; 2.50%</td>
</tr>
<tr>
<td>Switzerland</td>
<td>January 2000</td>
<td>CPI</td>
<td>&lt; 2.0%</td>
</tr>
</tbody>
</table>

Average Target: 2.0%

Sources: Federal Reserve, ECB, BoJ, BoE, BoC, RBA, RBNZ, Riksbank, Norges Bank and SNB
Structural factors: Reduction of long-term risk premia

- Bulk of the decline in inflation occurred in the 1980’s.
- But the standard deviation and co-efficient of variation of inflation has fallen from 0.8 to 0.2 since the 1990’s and confirms that increased central bank credibility has contributed to a reduction in long-term risk premia.

The level and volatility of G7 inflation have declined

![Graph showing the level and volatility of G7 inflation from 1981 to 2005.](image)

Source: RBC Capital Markets, Bloomberg

Real and nominal rates have peaked below the 1990’s

![Graph showing real and nominal interest rates from 1981 to 2007.](image)

Source: RBC Capital Markets, Bloomberg
Central banks can only claim part of the credit for reducing inflation.

Emergence of Asian and other emerging market manufacturers have contributed to a long term reduction in US import prices.
Structural factors: Globalisation of finance

- Growth in hedge funds i.e. liquidity providers has reduced the impact of any single shock. Contrast the implosion of LTCM and Amaranth.

- Hedge fund returns are lowly correlated to equities, bonds and FX in long term and have diversified the available investment strategies, despite periodic herding.

**Liquidity in FX market and use of options has surged**

![Graph showing the growth in daily FX turnover and options turnover from 1989 to 2007.]

**Hedge fund returns are lowly correlated to other assets**

![Graph showing the correlation of hedge returns with capital market returns, equities, bonds, and FX from May 1999 to May 2005.]

Source: RBC Capital Markets, Bloomberg
Structural factors: Growth in central bank reserves

- FX reserves have grown rapidly since 2000, particularly in the Middle East and Asia.
- Growth in reserves of G3 currencies has contributed to a reduction in G3 FX volatility as central bank have less volatile trading strategies.
- Asian FX volatility, however, remains cyclical.

Sources:
- RBC Capital Markets, Bloomberg
Well established that equity and bond vols are counter-cyclical, i.e., during recessions or economic slowdowns vols in equities and bonds rise.

But FX vols continued to trend lower during the 2000-01 US slump. FX vols are not necessarily counter-cyclical.

Source: RBC Capital Markets, Bloomberg, ECB
We expect FX volatility will remain in a downtrend but there are possible triggers for a spike in FX volatility as occurred in May 2006:

- Unwinding of extreme market positions, for example, in EUR/JPY.
- Declines in FX volatility have been compounded by investment strategies that persistently sell FX vols. An unwinding of extreme market positions could temper the magnitude of vol selling strategies.
- Reduction of FX liquidity, not from higher global rates, but from reduced number of liquidity providers, especially hedge funds, would increase vols.

Increases in volatility are only likely to be sustained if there is a loss of credibility in central bank policy, i.e., central banks appear to be behind the curve.