Market Risk Report
March 2007

Executive Summary

- Just when you thought it was safe. A drop in the Chinese equity market, discussion of the *possibility* of recession by Alan Greenspan and weak US data led to an end-of-month correction which sent volatility levels rocketing. However, to put it into context, most equity markets are still flat year to date, and implied volatility (VIX) is still below the peak of last May.
- Equity volatility rose dramatically. In particular North American volatility more than doubled to 13%. All regions and all sectors are now close to or above 12-month average levels of volatility.
- Bond yields fell by around 30bp as money left equities for safer bonds and the fixed income market shifted its view towards a US slowdown. Emerging market spreads widened at the end of the month. We promised you an article on the potential return of inflation in this issue. However, it seems that's not what the market is thinking, so we'll leave it until it becomes topical again.
- FX volatility rocketed for the Yen as speculation on the sustainability of the Yen carry trade increased. Yen volatility reached a new 12-month high of 11.4%.
- Option volatility is likely to have been high judging by rapidly increasing implied volatility. However, underlying equity market price movements were actually small over the month.
- Commodities were the exception. As the market's focus seemed to be elsewhere, volatility remained close to 12-month averages.
- Real Estate prices rose strongly but smoothly: volatility remained near 12-month low levels, with the exception of Japan where it rose to 30%.

In next month's issue: Trading Volatility: A Closer Look at the VIX Index

Author: Niall O'Connor

Key News (Major Volatility-Driving Events)

Crash! Well, not quite

All the fears of the last six months came into focus together on the 27th February, with big falls in all major markets. In fact the event can accurately be described as a 5-sigma event (i.e. 5 standard deviations from the mean).

Triggers appeared to be:

- A 9% decline in the Chinese equity market, leading to fears of a slowdown in commodity consumption
- Warning of a possible US recession by Alan Greenspan (you thought there was a new Fed Chairman?)
- Fears over costs and political implications of US military intervention in Iran

End of the Bull Market?

Last issue we were "back to the bull market", in this one it looks like we might be talking about the end of it.

However, the recent correction should be put into context. Although the fall in the Dow was the largest one-day drop since 2003, most major markets have rallied so strongly recently that they are now back to their levels of early-January. Many major markets are still up on the year.

What is clear though is that some of the complacency over volatility has gone: the VIX reached 18%, when it was just at 10% a week ago.

Yen volatility rises sharply

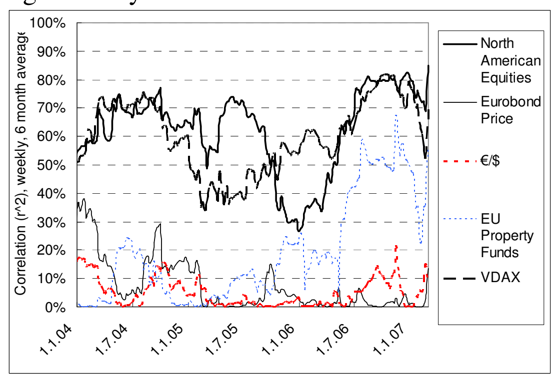
The Yen hit record low against the Euro on February 13th as the G7 decided weakness wasn't a problem. It was also at 21-year lows on a trade-weighted basis. Subsequently volatility rose sharply to over 11% as speculators either used the Yen carry (pushing it down) or bet on the Yen carry being forced to end (pushing it up).

Correlations Rise

There is an old saying that in crashes, correlations all go to 1. This appears to be held out in the current markets, with correlations rising sharply, even when looked at over a 6-month average as in the chart below. Interestingly the VDAX is very highly correlated to its underlying market.

The message is that diversification is very hard to find at present.

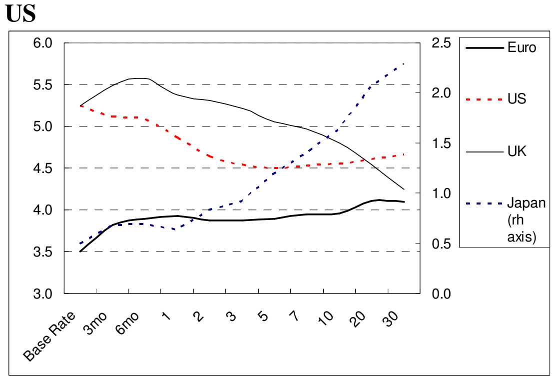
Correlations between the European equity market and other asset classes have risen significantly



The bond market starts to bet on slowdown again

The inversion of the US yield curve increased, suggesting more sharply falling growth, or at least lower inflationary expectations.

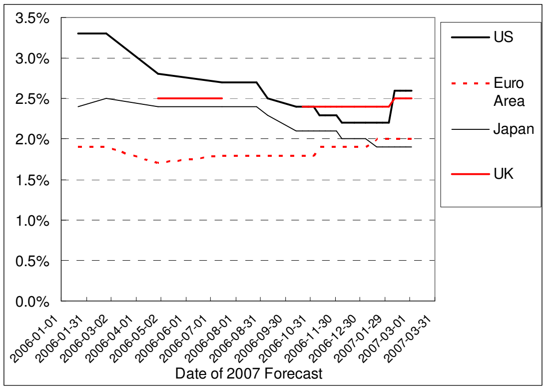
Yield curves also suggest inflationary pressures in the UK, but a weaker growth environment in the US



But GDP growth forecasts are still positive…

A look at the GDP growth forecasts for 2007 tells a somewhat different story: growth forecasts are actually up over the last month, with the consensus growth for the US now forecast at 2.6% (up from 2.2%).

2007 GDP growth estimates for the US and UK have actually risen. Those for Japan continue to fall



…And oil prices stable at $60

Oil prices have remained relatively stable, and, given other market events, have not been at the forefront of people's attention.

Equities

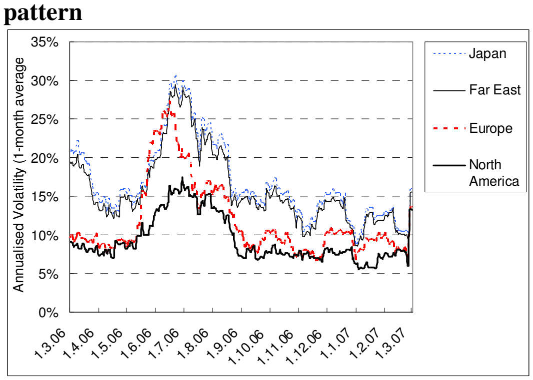
Overview: Fat Tails

The strong bull run which started in June 2006 appeared to end abruptly at the end of February, with major markets taking typically 4% one-day hits. Given the recently observed low volatility, this is actually around 5 standard deviations: an event which we would expect once in a million days under a normal distribution assumption. Lesson: market returns are not normal.

Volatility: Regions

In line with a bull trend, volatility had been falling since June 2006, for most regions reaching new 12-month lows in early January. However, it spiked up sharply at the end of February to between 13% and 16%.

Volatility fell during 2006H2, but has spiked in February 2007. All regions showed the same pattern

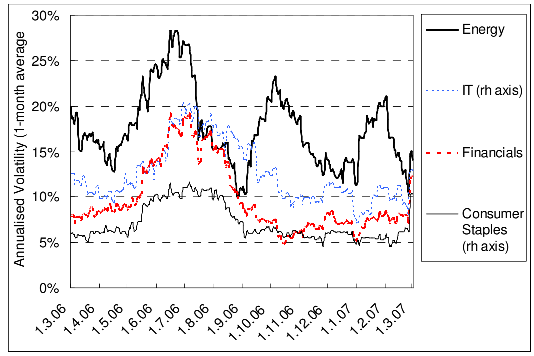


Note: based on MSCI regional indices

Volatility: Sectors

All sectors rose in volatility after having hovered at low levels since September 2006. Volatility is now between 10% and 15%.

All sectors saw volatility rise about 4 percentage points at the end of February

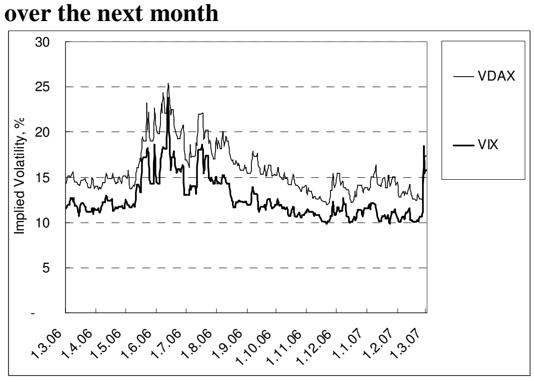


Implied Volatility (Market-Implied Near Term Outlook)

The VIX and VDAX indices show the expected volatility of the S&P500 and DAX respectively over the next 30 days based on options' prices.

Both spiked dramatically at the end of February: the VIX rising from 10% in mid-February to 18%. It is worth bearing in mind that this is still below the peak seen last May when the market corrected then.

The VIX (US) and VDAX (Germany) are both implying that equity volatility will remain higher over the next month



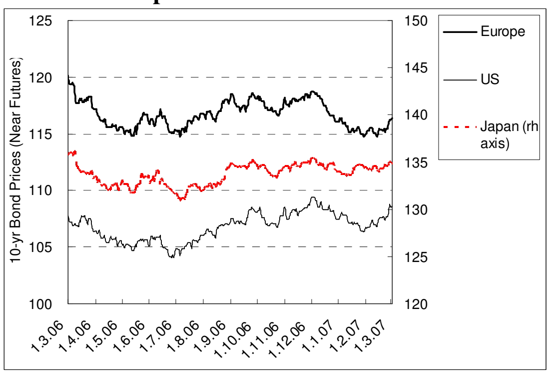
A quick note for anyone that thought they could have made money out of predicting this rise in the VIX: futures markets have been pricing in a significant increase for many months. If you had placed a bet that volatility was going to spike up (by buying VIX futures) you would have LOST money unless it was made within the last 3 weeks. Downside protection has been very expensive (see section on options).

Fixed Income (10 Year Government Bonds)

Prices

With equity markets falling and volatility increasing, bonds appeared to be a safe haven. Prices rose at the end of February, at least for highly-rated bonds. US 10-year government bond yields fell a whopping 30bp over the last month.

10-Year bond prices rose



Interest Rate Expectations

US markets still seem to indicate a rate cut is actually a possibility within the next 12 months, although this has been talked down in the US in order to avoid further downward pressure on the dollar. And the markets are now shifting to a view of stable rates, and some commentators are even talking now of rate rises. However, the yield curve still implies cuts to below 4.5% within 2 years.

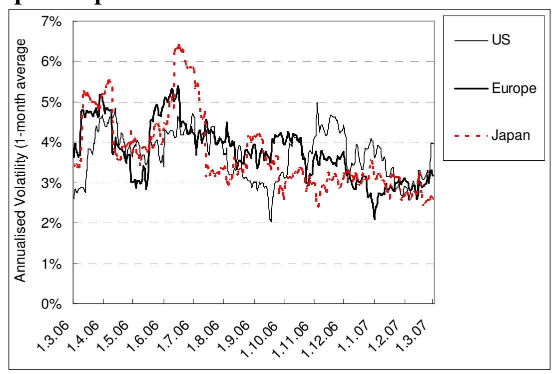
In the UK the market still expects rates as high as 5.75% within 6 months.

In Europe the yield curve looks more “normal” (upward sloping) and rate rise expectations remain with rates expected to rise from 3.5% to 4.0% within a year.

Volatility

Bond price volatility rose in the US, but much less than for equities. For other regions volatility remained static, and even fell in Japan.

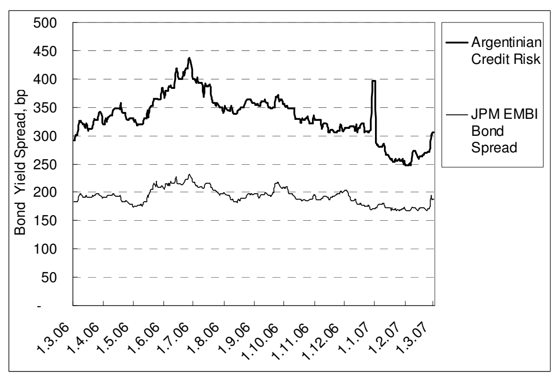
10-Year bond price volatility remains very low, but spiked up in the US



Spreads

Not surprisingly, spreads of Emerging Market bonds over Developed (JPMorgan EMBI index) reversed their long and steady decline seen over the last 5 years. Argentinean spreads rose to over 300bp.

However, the absolute levels are still low by recent standards, and it would appear risky bonds have not much more volatility than risk-free.



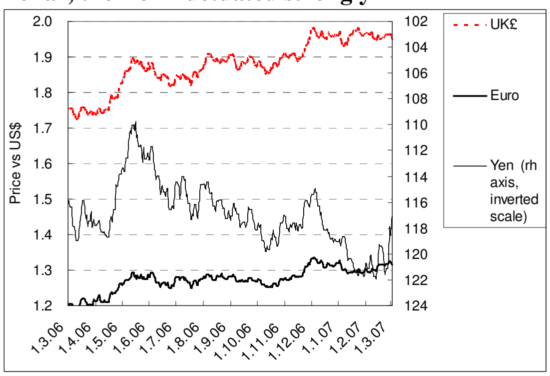
FX

Prices

The Pound and the Euro remained strong against the dollar, while the Yen fluctuated wildly.

Turbulence in the Yen carry trade seems to continue to be the main driver of the oscillations: on one hand people are setting up carry trades, weakening the Yen, on the other are investors betting that the large carry trade positions will have to be unwound: this is putting upward pressure on the Yen.

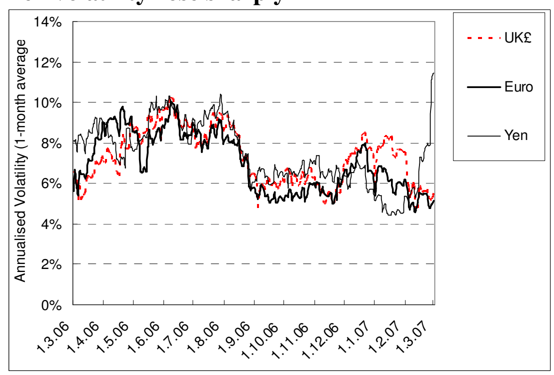
The Pound and Euro remained flat against the Dollar, the Yen fluctuated strongly



Volatility

As can be easily seen by the eye from the previous chart, the Euro and Pound volatility remained low against the Dollar, while Yen volatility rose strongly, from under 8% to 11.4%: a 12-month high.

Yen volatility rose sharply



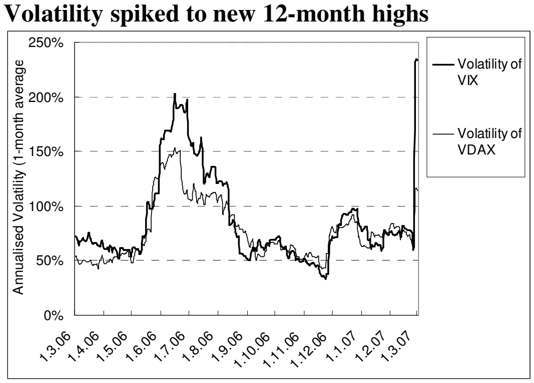
(Equity) Options

Volatility of Implied Volatility

Perhaps unsurprisingly, the chart of this looks similar to the VIX and VDAX, showing a peak in late June (then, as now, as a result of fears over US slowdown) and a large drop of volatility since then.

Perhaps the most dramatic chart in our report, the volatility of volatility of the VIX rose from 60% to over 230%.

Volatility spiked to new 12-month highs

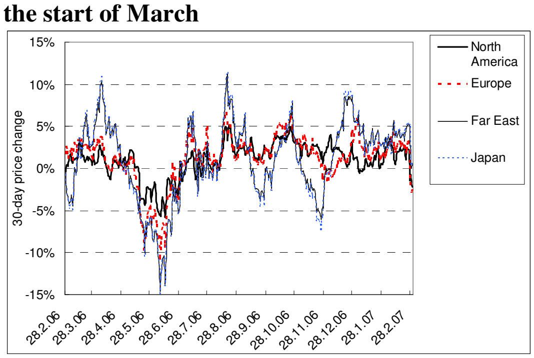


This large upswing in volatility will have increased the price of options, in some cases dramatically. This is particularly the case for out-of-the money puts, which traded at up to 22% for downside protection on the S&P 500.

Likewise, the delta of far out-of-the-money options could increase quite significantly, and with it the option's volatility.

(Equity) Price Swings

Equity price changes have been surprisingly small over the last month, but dropped again at the start of March



Perhaps surprisingly, equity prices have actually been relatively stable over the last month as they rose and then fell back.

This suggests that (equity) option deltas should have been relatively stable, at least from the underlying price change aspect. In the last two days prices have fallen futher, so calls will be more out of the money and puts in the money.

Note on Treatment

Options show more complex behaviour than the other instruments we look at in this report, so we make some simplifying assumptions. As Calls and Puts are in effect polar opposites and in and out of the money options behave very differently, it is hard to generalise all options' behaviour. However, we look at the two key drivers: volatility of implied volatility and major price movements of the underlying security.

Implied volatility (via the option Vega) drives option prices, so a big indicator of option price volatility is the "volatility of implied volatility".

Of course the biggest driver of individual option prices is the movement of the underlying (via the option Delta): a move in either direction will cause the option to go in or out of the money (and a corresponding change in the option Delta and price volatility). As a proxy for this, we look at the 30-day price swing of equity market indices; options on bonds or FX could of course behave differently. Calls and Puts will respond in opposite fashions: calls becoming more volatile as prices rise.

Note on Convertibles

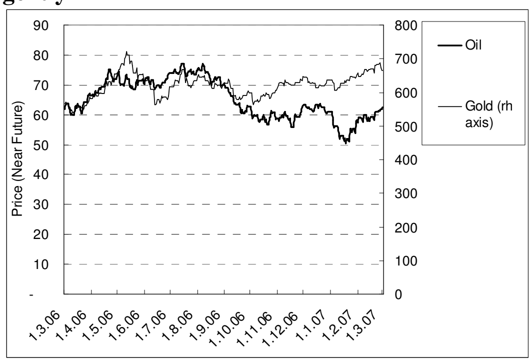
Convertibles are in effect a combination of a bond and a call option, with the bond portion usually making little contribution to the instrument volatility unless the option is out of the money. As such, convertible portfolios volatilities will normally behave similarly to call option portfolios, and this commentary can be applied to convertibles as well as options.

Commodities

Prices

Oil prices remained stable in February while Gold rose, perhaps seen as a safe haven in more volatile markets.

Oil prices were stable; Gold prices are rising gently

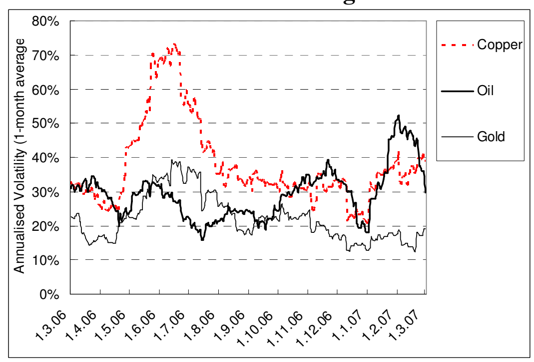


Volatility

Volatility of commodities was relatively stable in February, with the market excitement apparently confined more to the equity and FX markets.

Volatility levels are now at or slightly above 12-month averages.

Volatility levels for major commodities are now back to close to 12-month average levels



Real Estate (Real Estate Share Prices)

Note

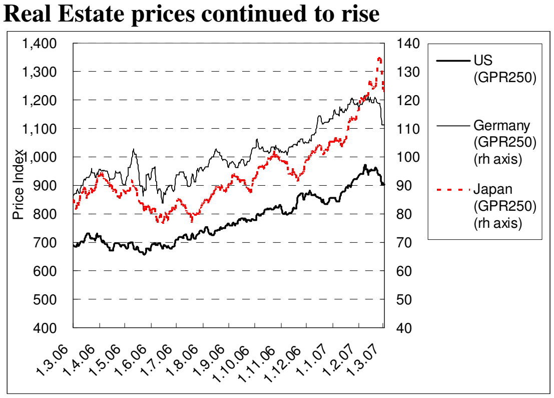
Note that for property we just look at indices of the share prices of property companies, and not the underlying property directly, for which little good data is available. This is usually consistent with funds which tend to invest in property indirectly, e.g. via REIT's.

Prices

Prices continued to rise during February, with Japan particularly buoyant.

Recent weakness in US residential property data has hardly dented the listed property market.

Real Estate prices continued to rise

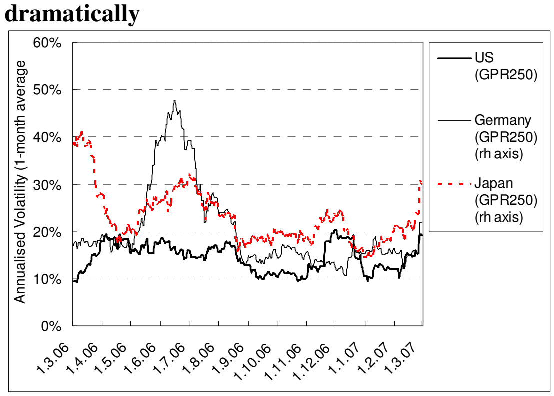


Volatility

Price rises were consistent and orderly, so volatility remains low in the market with all regions just above 12-month averages.

The exception is Japan, where at the start of March volatility levels rose to 30%.

Real Estate volatility levels rose but not dramatically



Notes

Definitions

To avoid repetitions, the term volatility refers to annualised, 30-day average realised volatility in local currency unless otherwise specified. As such it may be lower than, and lag, shorter-term market volatility in times of high market volatility.

Charts show data up until 2nd March 2007 and the commentary was written on or before 2nd March 2007.

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