Introduction

This note details how we analyse the risks that we present in our monthly *Economic and Financial Market Risks* publication.

This publication seeks to identify – early – economic, policy, and on occasion political, issues which stand to become important to markets, investors, and businesses. We concentrate particularly on the coming 3-12 months, but periodically we also look further ahead.

Procedures and methods of risk analysis have to be appropriate for the task in hand, and our procedures have been designed particularly for the post-2008 era. In this period:

- **Risk has returned to the fore:** the seemingly low-risk economic and market environment of the decade to 2008 has been displaced by one that is high-risk

- **Macroeconomic forces, including policy, have regained importance:** indeed in some markets policy has become almost the exclusive driver

- **Uncertainty, and thereby risk, extends to the most basic issues:** investors are divided on not only the likely magnitude, but sometimes also even the direction, of questions as fundamental as inflation; macro policy potency and transmission mechanisms; whether growth has resumed in major economies; and whether productivity, and thereby potential growth, will pick up to previous trend rates

- **Valuation or asset-allocation models have become correspondingly uncertain,** particularly to the extent that, implicitly or explicitly, they place undue weight on the period leading up to the crisis in 2008

We concentrate on areas where, in our judgement, there are serious grounds for challenging consensus thinking: we do not attempt to 'cover the waterfront'. We then research these chosen areas carefully and fully.

A particular feature of *Economic and Financial Market Risks* is that we systematically detail what to watch for, so as to be able to monitor whether (or not) matters are evolving broadly in line with the risks we have identified.

Some considerations in making macroeconomic forecasts and assessing risks

From economics to markets

We subscribe to the view expounded by the Swedish economist Gunnar Myrdal that, while market movements may, often for a surprisingly long time, apparently deviate substantially from underlying economic fundamentals, "In the end, the facts kick." [1] Hence our risk analysis begins with the economics, and then proceeds to the financial markets.

Choosing the right framework

In undertaking such forward-looking analysis, the first step has to be to choose the appropriate economic framework – or, more specifically, to determine the appropriate emphasis to place on various of the elements that history has shown, in one situation or another, to be important.

For example, in the quarters following the 2008 Western crisis, relationships from what Sir Mervyn King dubbed the 'NICE' decade[2] to 2008 offered little guidance about the immediate future:

- The slowdown, having been induced by financial crisis, was qualitatively different from most other Western post-WWII slowdowns, which generally were not caused by problems in banking systems; and

- To the extent that recovery from some individual-economy financial crises, notably those of Finland, Sweden, and Norway in the 1990s, had been reasonably quick and strong, these were driven to an important extent by brisk export growth, the result of currency depreciation in a world in which international trade was growing strongly. This would not be possible in the West post-2008, when all the major economies were in recession.

Thus in order to be able to forecast post-2008 developments, and hence to be able assess the associated risks, it was necessary to take due account of both the mechanics of recoveries from past financial crises; and the experience of past simultaneous cross-country economic downturns.

Operationally, therefore, to gain a good understanding of risk in any epoch it is in general necessary to:

- Examine earlier epochs, to identify lessons likely to apply over the coming years;
- Identify the key, sometimes newly-important, macroeconomic drivers;
- Trace the ways in which those forces will play out in the economy and financial markets; and
- Quantify the likely consequences for the economy and hence financial markets.

Incorporating past lessons

While it is important to employ a framework that is suited to the prevailing circumstance, it is equally important not to lose sight of general lessons from the past that will apply in almost every situation, and hence should always be part of the analytic framework. These include:

    i. **Inconsistencies:** single-country forecasts often contain implicit inconsistencies. In GDP forecasting, for example, the sum of individual-country forecasts of exports often exceeds the sum of individual-country forecasts of imports. This is logically impossible in aggregate, at the level of the world economy. Thus single-economy GDP forecasts often contain an upward bias due to such 'export optimism'. Inflation forecasts similarly often suffer from an equivalent 'inflation optimism' bias – generally downwards.

    ii. **Conservatism:** the variance of forecasts is typically less than that of outcomes, i.e. forecasters tend to shave the tops and the bottoms off their forecasts

    iii. **Clustering:** forecasters tend to cluster around one another, presumably for fear of looking unwarrantedly extreme

    iv. **Size-of-organisation bias:** the degree of clustering tends to be an inverse function of the size of the institution making the forecasts:
  - Forecasters working in large organisations tend to be closest to consensus;
    - Part of the reason is that they are particularly prone to not wanting to be perceived by their colleagues as extreme;
  - Forecasters in small organisations by contrast have a tendency to be more extreme;
    - Part of the reason is that if they are wrong few people notice, whereas if they are right they can draw attention to the fact, and gain publicity that they would never have been able to buy

    v. **The 'date of forecast' issue:** it is difficult, for a variety of reasons, to assess how accurate economic forecasts have actually been. A year-ahead forecast may change importantly, even fundamentally, following a budget or a major development such as a war or a major increase in oil prices. Forecasts made even only a few days apart may therefore differ substantially

    vi. **Accuracy:** economic forecasts are less accurate than is implied by the way in which they are typically presented – often to within a tenth of a percentage point for GDP and inflation. In fact, forecasts are typically at least an order of magnitude less accurate:[3]
  - Many, perhaps around half, of year-ahead forecasts of single-country real GDP typically lie only within a percentage point or so of the eventual outcome;
  - About a quarter lie between 1 and 2 percentage points of the outcome; and
  - A handful of errors are particularly large, notably when economies are affected by a shock that is both large and novel;
    - For example, errors of 4 percentage points or even more were made by many forecasters following the first global oil shock, in 1973/74

    vii. **Comparison with naïve forecasts:** forecasting performance is however generally better than that offered by conventional naive models, such as those which take as their prediction, say for the coming year, either the value of the previous year or the average of some previous run of years

OECD and IMF projections form the basis, explicitly or implicitly, of most macroeconomic forecasts

These projections[4] have the virtue of being globally consistent. This is important: while achieving global consistency in a set of forecasts does not ensure that the forecasts will be right, global inconsistency guarantees that they will (collectively) be wrong.

In particular:

- Projected exports and projected imports are constrained by the OECD and the IMF to be equal at the global level (after making due allowance for the world statistical discrepancy)
- This eliminates the systematic "export optimism" that characterises many single-country forecasts
- OECD and IMF export- and import-price forecasts similarly are globally consistent

Private sector, high-frequency, forecasters however depart from OECD and IMF projections

There is good reason for this:

- The international organisations are charged by their (government) clients with offering policy advice: and part of the basis for this has to be a set of forecasts that indicate what is most likely to eventuate if policies stay as they are

- Private sector forecasters, by contrast, are generally charged with giving their (private sector) clients their judgement about what is likely to happen in practice: and that includes changes in policy. Hence private sector forecasters modify, implicitly or explicitly, OECD / IMF projections to take account of two principal sets of influences:
  - – Changes that they expect to be made in policy settings; and
  - – Evolving, high-frequency, evidence on how the economy is actually behaving

The consensus, or average, of private sector forecasts is hard to beat

There is a wide body of evidence that the average of a large set of independent forecasts is on average more accurate than that of any single forecaster[5]. This finding seems to apply to economic forecasts also.[6]

The accuracy of the consensus forecast depends upon three basic conditions being met[7]

i. The number of forecasters needs to be large – ideally around a thousand;

ii. The forecasters need to have diverse approaches and thought processes[8]; and

iii. The individual forecasters and thereby their forecasts need to be independent of one another

In practice, the requirements for a best-possible consensus forecast are seldom fully met

i. While the number of people and organisations engaged in macroeconomic forecasting today is large by historical standards, they nevertheless number only in the (few) dozens rather than in the thousands – the sample cannot truly be called "large";

ii. Most professional forecasters have a fairly similar intellectual framework, so that most professional forecasts tend to be made using broadly similar methods; and

iii. The forecasts are almost certainly not truly independent, because of the tendency of many, probably the majority of, forecasters to "cluster".

It is therefore possible in principle to improve on the accuracy of the consensus forecast

To the extent that it is possible to identify likely biases in the consensus forecast, it is in turn possible, again in principle, to beat the consensus forecast.

The experience of our team is that the greatest opportunity for beating the consensus forecast arises when the majority of forecasters are operating within broadly the same – but inappropriate – intellectual framework.

This can happen for a number of reasons:

- Economics teaching tends to run in fashions, so that the intellectual framework which current economists are forecasting may be ill-suited to the circumstances; and
- Modern economic curricula contain little economic history, so that potentially-relevant lessons from the past are missed

How we make our economic forecasts, and hence derive our economic risks

We start with consensus forecasts

Wherever possible, we start with the consensus forecasts for the main countries and regions as reported by Consensus Economics.[9] For countries and regions that are not covered by Consensus Economics, (Africa and the Middle East) we construct a consensus-like forecast from a range of forecasters whom we particularly respect, including importantly, the IMF World Economic Outlook.

We then introduce a number of carefully-considered changes

Modifying the consensus forecasts involves three conceptually different steps:

i. Look for situations where the framework of analysis underpinning the majority of the consensus forecasts may be inappropriate in the particular circumstances;

ii. Study closely the stated reasoning that underpins the forecasts of those whose analysis we most respect; and

iii. Examine in what direction, and by how much, their forecasts deviate from consensus

We then seek to take account of the most important evidence from earlier epochs. Most people forecasting today have direct experience of only three or four complete economic cycles.

At present we take particular account of the evidence from epochs of private and/or public sector debt deleveraging, devaluation, or default e.g.

- The 1930s

- The experience of the Nordic countries in the 1990s; and
- Japan in the 1990s.

We then consult widely and closely with policymakers and advisors to form a sense of how they are analysing the evolving economies in general, but particularly how they see the likely evolution of policy, especially when we judge that this evolution may be being incorrectly assessed by the forecasters who make up the consensus.

Finally, we try to 'aim off' for clustering and other biases where we think we see them.

Our thinking is thus not constrained *a priori*

Rather, our approach is eclectic. It seeks to be historically informed, and may thereby, depending upon the prevailing circumstances, contain elements of different relevant schools of thought, such as "Austrian", pre-Keynesian, Minsky, and other relevant theory.

We prefer non-rigorous realism to rigorous unrealism

While our process is more judgemental than we would ideally like, there is currently no alternative.

Our judgement is that we are more likely to produce a better forecast, and thereby beat the consensus, by selectively weighting evidence from relevant past epochs. The 60-odd annual observations, and the 240-odd quarterly observations, that are available in the longest of the post-World War II data sets for the main economic variables might seem, on the face of the matter, to confer ample information and degrees of freedom. However, this is largely illusory:

- The great majority of the observations pertain to periods when economic conditions were comparatively normal, and fluctuations limited; whereas
- By contrast, the number of episodes in which fluctuations were large, and which contain information that is relevant to the current situation, is relatively small

We aim for our forecasts to have, on average, a wider variation than that of the consensus

Our write-up places particular emphasis on potentially extreme outcomes. But equally, our write-ups explain the principal reasons for the differences between our forecasts and consensus.

We also show, for reference, average growth rates for the period 1989 to 2007

These end-dates were chosen as broadly comparable cyclical peaks in activity for the world economy, and thereby provide:

- A summary guide as to the rate at which the various major economies have achieved in the past; and thereby
- A yardstick against which to compare and contrast the current outlook.

How we in turn derive our financial market risks

The process starts with our identified economic risks

The challenge is to think through the potential market implications of GDP and other variables turning out the way that our risk analysis suggests they may.

We then proceed to asset-valuation implications

In a perfect world, a forecasting model would contain all the relationships needed for analysing all situations. In practice however such models do not exist, so that it is feasible only to:

- Modify existing model results judgementally; and/or
- Simply draw broad conclusions from historical periods which bear a general similarity to the regime currently in place.

In practice we do a combination of the two, by endeavouring to superimpose on contemporary developments key financial market relationships observed during broadly equivalent historical episodes.

Over the decades, different things have been important at different times:

- Households have sometimes wanted to build up their savings, while at other times they have desired more leverage;
- Governments have sometimes wished to expand their fiscal influence, while at others they have sought to consolidate;

- Central banks have aimed for various targets (e.g. price stability, full employment, stable output) and have used various intermediate targets such as money supply, interest rates, or exchange rates.

The current challenge

At present it is necessary and appropriate to take particular account of periods that were characterised by:

- Debt deleveraging
- Exchange rate manipulation, and/or
- Default

To the extent that there has been a structural increase in the premium attached to liquidity, then:

- Real interest rates for highest-quality bonds are likely to be somewhat lower than they would otherwise have been;
- While low inflation expectations and/or low growth expectations imply low nominal rates, with these rates near the zero-bound the relationship between yield curve level, slope, and convexity breaks down somewhat, as happened in Japan in the mid-1990s;
- The relationship between real interest rates and inflation expectations (break-evens) is likely to behave differently through the economic cycle;
- Countries running trade- and/or current-account surpluses are likely to have stronger currencies than otherwise;
- Implied volatilities for many assets may remain stuck at levels unusually high relative to realised volatilities, implying a higher volatility risk premium; and
- The volatility surface for most assets is likely to reflect a larger demand for insurance against so-called tail risks (i.e. is likely to remain more "convex")

An experienced team

Applying the methods described above requires experience and expertise. Our Risks team has such breadth and depth, gained in the OECD, the World Bank, the EBRD, Deutsche Bank, Lehman Brothers, and in asset management.

- John Llewellyn, BA (Wellington), D.Phil. (Oxon); formerly head of forecasting at OECD and chief economist Lehman Brothers
- Preston Llewellyn, BA (Sussex), MSc (Grenoble), MBA (Imperial College); formerly Thermotor, and Beetle Capital
- Russell Jones, BSc and MSc (Bristol), formerly UBS, Lehman Brothers, ADIA, and Westpac
- Ben Combes, MA (Edinburgh), MSc (University College London); formerly Oxford Economics and GFC Economics
- Lavinia Santovetti, MSc *cum laude* (University of Rome La Sapienza), MSc (UCL); formerly Lehman Brothers and Nomura
- Bimal Dharmasena, BSc (Southampton University), MSc (LSE); formerly Centre for Policy Studies and BBC
- Betsy Hansen, BSBA Honours (Denver), MSc (LSE); formerly Variant Perception
- John Butler, BA Hons (Occidental), MA (Fletcher School) now Amphora Capital; formerly Deutsche Bank, Lehman Brothers
- Simon Commander, BA Hons (Oxon), PhD (Cantab) now Altura Partners; formerly World Bank and EBRD
- Sandra Horsfield, BSc and MSc (LSE), Lehman Brothers, Barclays Capital, Llewellyn Consulting, and Penrich Capital
- Pete Richardson, BSc and MSc (Queen Mary), formerly UK Treasury, Department of Trade and Industry, and OECD
- Kelly Tonkin, BSc Hons (University of Canterbury) now Penrich Capital; formerly Lehman Brothers and NZ Treasury

We supplement this in-house expertise with frequent discussions with senior policymakers and decision makers.

Data sources

Average GDP growth rates

For the long period 1989 to 2007 these were taken from a range of sources:

- Individual-country growth rates were calculated using real GDP levels in constant prices and national currencies from the IMF World Economic Outlook database, April 2010.
- For the euro area regional sub-total we have used a special series of OECD-calculated growth rates that have been extended back some years prior to the formation of the euro area. (See OECD *Economic Outlook 2010* issue 1, 2006 issue 2, 2005 issue 1, 2003 issue 1, and the OECD Stat Extracts database accessed 17 September 2010.)
- We do not show figures for some other regional sub-totals because, with a number of economies in Asia in particular having grown so much faster than almost all other economies, and with a number of exchange rates having changed markedly, deciding upon the weights that should be applied in calculating regional or global totals is more problematic than is customarily acknowledged.

From 2009 onwards actual GDP growth rates come from the IMF World Economic Outlook database

Regional sub-totals

There is a potential problem in calculating regional sub-totals, due to the rapidly-changing regional weightings in the global total that result from the relatively rapid growth of a number of economies, particularly in Asia. We handle this potential problem for calculating regional sub-totals and the global total by using a 'couplet' method.

For example, to calculate regional sub-totals and the global grand total for GDP for year (t) we:

- Take IMF current-price GDP figures for every individual economy for year (t-1)
- Multiply each economy's year (t-1) figure by its forecast (volume) GDP growth rate for year (t)
- Calculate regional sub-totals and the global grand total by summing individual-economy values for years (t-1) and year (t) for each of the two years
- Calculate the growth rates for the regions and the world as a whole for year (t) from these regional sub-totals and the global grand total respectively, thereby obtaining regional and global totals for year (t) in year (t-1) prices, aggregated using year (t-1) weights
- Repeat this procedure for year (t + 1) using the individual-economy figures for year (t) as the base. And so on.

Conclusion

Our integrated process affords, we judge, a constructive approach to assessing risks in economies, and in financial market valuations and hence asset allocations.

Investors thus informed stand, in our judgement, to gain on average an advantage over those who use the product forecasting models or valuation tools that place an inappropriately small weight on previous relevant epochs. They should be able to predict with somewhat greater probability the most likely financial market responses to a given set of macroeconomic scenarios; or at least to assess somewhat more accurately the risks that attach to the consensus forecast.

We welcome comments and criticisms from clients of our method, both macroeconomic and financial, and of our presentation – both numerical and written.

A complete set of our Risks publications is available on our website. These publications, which are sent to clients, are uploaded with a three months lag.

[1] This observation was made to John Llewellyn, in the early 1970s, in the course of a car journey between Oxford and Cambridge. The phrase "In the end, the facts kick", we have been told by the Swedish economist Klas Eklund, is a literal translation of a Swedish saying.

[2] 'NICE' = "Non-Inflationary Consistently Expansionary". The phrase was coined by Bank of England Governor (now Sir) Mervyn King, in his first speech as governor, on 14 October 2003, in which he spoke of "… a *n*on-*i*nflationary consistently *e*xpansionary - or '*nice*' – decade; …" – see http://www.bankofengland.co.uk/publications/Documents/speeches/2003/speech204.pdf

[3] This conclusion has been drawn from the evidence of a number of post mortems of forecasting accuracy. For an early example, see Arai, H., and Llewellyn, J., *International aspects of forecasting accuracy*, OECD Economic Studies, Autumn 1984 http://www.oecd.org/dataoecd/61/27/2502379.pdf. There have been many subsequent studies, including importantly Wallis, K.F., (1989) *Macroeconomic Forecasting: A Survey*, Economic Journal. An important study of the IMF's forecasting accuracy was undertaken in Artis, M., (1988), *How Accurate Is the WEO? A Post Mortem on Short Term Forecasting at the IMF,* International Monetary Fund.

[4] Strictly speaking, while the outputs of the OECD and the IMF are generally referred to as "forecasts", they are in fact conditional projections, in that they are constructed to show policymakers what the respective secretariats judge would happen on the basis of specific assumptions about the stance of policy – often 'no change in policy'. Such assumptions are appropriate for these organisations to make, given that a principal aim of the projections is to serve as a basis for member governments to consider whether (or not) it may be appropriate to change the stance of policy. However, the concern of most private sector forecasters, by contrast, is to forecast what will actually happen: and for that it is necessary, *inter alia*, to forecast the course of policy itself.

[5] This proposition is brought out particularly clearly by Surowiecki, J., *The Wisdom of Crowds: Why the Many Are Smarter Than the Few*, 2005

[6] This point is demonstrated by Batchelor, R., (2000), *The IMF and OECD versus Consensus Forecasts*, City University Business School, London.

[7] For more on this, see for example Surowiecki, op. cit..

[8] In *The Monetary Policy Committee: five years on,* Mervyn King tells of "A famous 1970s laboratory experiment ... that featured groups of senior managers working together to solve a complicated problem in a game called 'Lost on the Moon'. Subjects were asked to rank a list of objects in order of their necessity for survival after their spaceship had inadvertently crash-landed on the moon. It was found that the best-performing groups – or those which got closest to the ranking suggested by experts at NASA – were those which were least consensual in the early stages of discussion, exploring all possible avenues and ideas. Groups which established a common consensus quickly were often ineffective, suggesting that at least some disagreement is beneficial for committee performance because it stimulates discussion and hard thinking. " For the original presentation, see Hall, J. 'Decisions, decisions, decisions', Psychology Today, November 1971

[9] For further information on Consensus Economics, see their homepage. For the original account, see http://www.consensuseconomics.com/