

## P M W Tucker: “Where are the risks?”

Speech by Mr P M W Tucker, Executive Director and Member of the Monetary Policy Committee of the Bank of England, at the Euromoney Global Borrowers and Investors Forum - remarks to the session “Where are the risks?”<sup>1</sup>, London, 23 June 2005.

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Central bankers are fond of discussing myriad uncertainties in the global macroeconomic and financial environment. Yet judging by the level of implied volatility, derived from option prices, on a wide range of asset classes, the market perceives uncertainty as fairly low. And, even after the recent adjustment, credit spreads across a wide range of instruments suggest that the premium charged for risk has fallen over recent years. This, all in an environment where long-maturity risk-free forward rates – real and nominal – are unusually low. It is hard to know quite what to make of this, but it forms an important backdrop to the few remarks I want to make today.

For this audience, I think the interesting question is not whether or not risk will crystallise, as in one form or another risks crystallise every day. Rather, the important question is whether, in the event of nasty shocks, our capital markets can absorb them or whether they have developed characteristics which may, as some suggest, leave them vulnerable. Or, more constructively, what risk managers – and the authorities – might usefully monitor to help contain any such risks.

It's hardly a new question. But it's one that has gained colour from the debate about derivatives. An oddly polarised debate. Overstating it somewhat: in one corner, a group contending that derivatives bring tangible benefits to civilisation. In the other, a group arguing that they have within them the seeds of severe disorder.

Unsurprisingly, my take is that the truth lies somewhere in between. It is nicely illustrated by the quite extraordinary development of the credit derivatives market over the past five years or so.<sup>2</sup>

### Dispersion of risk, and the price of risk

Credit derivatives plainly have been used as an effective risk management tool by a number of banks and others. Contrary to some suggestions, the acid test is not especially whether banks, individually or in aggregate, have been net sellers of credit risk. Individual banks have been able to reduce concentrated loan exposures to single corporates, industries or countries. As the Telecom episode reminded everyone just a few years ago, that is really important, if elementary. Individual banks have also been able to increase their exposure to borrowers with which they do not have a lending relationship. (Indeed, some commentators suggest that it may sometimes be more effective for second-tier and smaller banks to take corporate credit exposure via the derivatives market than via participation in the lower tiers of loan syndicates.) If, overall, the result were a greater dispersion of risk around the banking system and fewer large exposures relative to capital, the system as a whole would probably be safer even if, net, no credit risk had left the banking industry in aggregate.

According to various surveys, some credit risk has been shed to non-banks, including insurance companies, pension funds and hedge funds. That too should, on balance, promote the resilience of the system, not least because non-banks are not part of the core payment systems that underpin our financial markets – provided, of course, that banks prudently manage their counterparty exposures to non-bank sellers of credit protection. As others have argued, this is a change of degree rather than kind: with the growth of corporate bond markets, and especially securitisation, non-banks have been

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<sup>2</sup> For an early review, see Rule, D, (2001) ‘The Credit Derivatives Market: its Development and Possible Implications for Financial Stability’, Financial Stability Review, Issue 10, June 2001, pages 117-140 and Rule, D, (2001), ‘Risk transfer between banks, insurance companies and capital markets: an overview’, Financial Stability Review, Issue 11, December 2001, pages 137-159.

running credit portfolios for years. By separating the provision of liquidity from exposure to credit risk, credit derivatives, and the related developments in structured finance, give non-banks new ways of accessing credit risk.

As well as more dispersed risk buttressing systemic stability, the innovation of credit derivatives has plausibly taken us a further step towards complete markets, in effect providing a richer market for credit insurance than previously existed. Investors and others may, therefore, be able to get a little closer to the portfolios they really want to hold, which would facilitate a better allocation of risk and so bring broader welfare benefits. This works in the direction of reducing the price of risk, which would reduce the risk premium used to discount uncertain future cash flows.

There are, therefore, tangible benefits from the new derivative markets for unbundling and transferring credit risk. And the same can be argued for the earlier development of interest-rate, foreign currency and equity derivatives.

So where's the catch?

### **Short-option positions and market dynamics**

Everyone is familiar with the risk present in markets if 'everyone' tries to sell – or buy – at once. Various features of markets can create the conditions for, or reinforce, such herd-like behaviour. Panic in the presence of excess leverage is the familiar culprit, and goes back to well before the invention of derivatives, as various authors have documented in the context of the Great Crash. Derivatives have not altered the firmament in some deep, unrecognisable way. But they have introduced some novel variations on old themes.

One of the most interesting can potentially arise when a particular market is characterised by traders who are structurally short options, have short holding periods, and are leveraged; and where the underlying markets are not highly liquid. That needs a bit of unpacking.

Options can, of course, be hedged with an offsetting position in a similar option: a so-called 'static hedge'. Where, for one reason or another, traders cannot do that, they can attempt to hedge by running a position in the underlying instrument, with the intent that gains or losses on the value of their option positions will be offset by losses or gains on the underlying asset position: a so-called 'dynamic' hedge. It's dynamic hedging that can be interesting.

The effects of dynamic hedging of long and short option positions can be quite different. Broadly, dynamically hedging a long option position entails selling the underlying as prices rise, and buying as prices fall. Conversely, those who have short (or written) options need to buy to balance their hedge when the value of the underlying is rising, adding to the buying pressure. And, if the price of the underlying instrument is falling, they need to sell to balance their hedge, adding to the selling pressure.

This is, of course, going on every day in a wide variety of deep and liquid markets without anything particularly odd happening to market dynamics. Things are potentially more interesting when markets are structurally imbalanced, with short-term traders, dynamically hedging, concentrated on one side. If short-term traders are structurally long, their dynamic hedging may have the effect of dampening market movements, producing zones of *local* stability. But where, as a group, they are structurally short, their dynamic hedging can sometimes amplify price movements, increasing volatility, if the market proves illiquid under stress.

While I have set this out in a rather general way, it isn't fanciful. There are examples of it going back over nearly twenty years: some involving the explicit writing of options; some implicit writing of options; and some arising from trading strategies that mimic optionality.

For example, the 1987 equity market crash was exacerbated by the prevalence of portfolio insurance, a trading strategy akin to delta hedging an option: sell when prices are falling. A dynamic variant of a 'stop loss'.

Similar strategies are now a key feature of some Principal-Protected hedge fund investments, via so-called Constant Proportion Portfolio Insurance (CPPI). To preserve the nominal principal, the 'guarantor' will sell units in, say, a fund of funds as its value falls, and vice versa. I guess some assumptions are made about underlying liquidity, and that these are reflected in how such strategies are effected.

In 1994, and again in 2003, hedging the negative convexity of US mortgage-backed securities amplified the rise in dollar bond yields, with some violence.<sup>3</sup> The underlying factors here, of course, are that US mortgage borrowers have an option to prepay, so they are long options on mortgage interest rates. The financial sector is, correspondingly, structurally short options, which it can – and does – slice and dice in various ways in an attempt to distribute the option exposure to those who want it. But to a greater or lesser extent, a residue is left, some of it with institutions which de facto seem to have short holding periods. They dynamically hedge, either continuously or within thresholds.

A rather graphic – if, ultimately, not stability-threatening – example of what I’m describing occurred a few weeks ago in the structured credit markets. I’ll spend a few moments on this as the distribution of optionality was quite complex. For some while, a wide range of regional banks, insurers and pension funds in Europe and Asia have been selling protection on intermediate tranches of credit portfolios, say on losses between 3% and 7%. Although they are effectively short an option on portfolio credit risk, they are widely regarded as passive investors who do not dynamically hedge. Their counterparts, the dealers, are initially long an option on portfolio credit risk; as spreads generally widen, the value of the bought-protection position increases non-linearly. Over time it became popular amongst short-term leveraged traders to exploit the strong supply of intermediate (or mezzanine) protection by holding a bought-protection position on mezzanine tranches as a hedge against selling protection on equity tranches. This was a so-called long credit correlation position, as its value would tend to increase with rises in the implied correlation of default risk among the companies represented in the underlying portfolios. In effect, traders were betting that implied correlation, as modelled, would not fall. As well as being highly convex, the position’s popularity no doubt owed something to a straightforward search for yield: the big positive carry from being long high-yielding equity tranches and short lower-yielding mezzanine. This type of position did, though, leave holders exposed to so-called *idiosyncratic* risk; that’s to say, a deterioration in the credit of a few constituents of the underlying portfolio. This was akin to a short-option position, requiring dynamic hedgers to buy protection as spreads widened on troubled names. When GM and Ford spreads rose, these correlation positions unravelled as traders went into the market to cover themselves. In effect, the structured credit market was reminded that credit risk has a major idiosyncratic element; that even the most sophisticated statistical models can be found wanting when they are detached from fundamentals and/or based on short runs of data; that hedging can hurt when a trade is ‘crowded’; and that, in such circumstances, volatility can suddenly spike and spreads move in unplanned-for ways.

There are still-more complex variants. In some instances, options are embedded into products where there isn’t a liquid market in options with quite the same characteristics or long expiry dates. Power-Reserve Dual Currency Bonds may be an example,<sup>4</sup> although not one where excess volatility has yet crystallised.

While these and other examples suggest that, in certain conditions, volatility can be exacerbated by option-driven or option-like trading strategies, related developments in global capital markets can at times help to dampen volatility. Notably, with the growth of the hedge fund industry, there are more short-term traders willing to take risk – in effect providing liquidity – when they perceive a temporary anomaly, as perhaps happened in the US bond market during summer 2003. That is somewhat less likely, though, when the prior trading strategies of funds themselves have become part of the underlying imbalance.

This points up a useful lesson. That the major intermediaries – and the authorities – would do well to try to identify where there might be big structural short, or imbalanced, option positions in a market whose liquidity might be strained in stressed conditions. Sometimes, as for example in the US mortgage market, this amounts to identifying a structurally long position and asking whether the counterpart short positions are well distributed and how managed. Sometimes, as perhaps in the structured credit market, it may amount to asking whether there is anything that could trigger an exit by apparently long-term and passive holders of short option positions. For the firms themselves, this kind of analysis may be something that could be fed into stress tests developed in recent years to examine the effects of the exit of a dealer or major fund. Central banks rely largely on market intelligence. At the Bank of England, one of the questions we now more or less routinely ask in our MI work goes along the lines of “is the Street and/or is the fund community short volatility /gamma/vega in a big way

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<sup>3</sup> ‘The dynamics of US dollar interest rate adjustment’, Financial Stability Review, Issue 15, December 2003, page 22.

<sup>4</sup> ‘Structured notes and the US dollar/yen exchange rate’, Financial Stability Review, Issue 14, June 2003, page 43.

in any particular market?" This is discussed further in the latest edition of the Bank of England's Financial Stability Review, which is published next Monday. Regulators can put any general information gleaned from MI alongside their more granular sources on the positions of firms.

A risk properly understood is, I hope, a risk that can be managed effectively. And so my analysis of the impact of options hedging on market dynamics does not cancel out the benefits that derivatives can potentially bring. For the reasons described earlier, the plugging of 'missing markets' is something to welcome.

### **Innovation, competition, and risk management**

That so many markets are no longer 'missing' owes something to innovation in the wholesale financial services industry. The underlying forces driving innovation seem to be powerful, and indeed perhaps self-feeding. They may also give rise to some risk management challenges.

One possible story – there are others – would go along the following lines.

Core wholesale markets have become more efficient. This has been driven by a whole host of things, including improved technology and deregulation reducing transaction costs; the unbundling of different types of risk associated with the development of derivatives; and the entry of relatively unconstrained traders, including hedge funds. One result is that in 'vanilla' markets it may have become more difficult for intermediaries to make positive risk-adjusted returns that exceed their cost of capital. Anecdotally at least, they make a more attractive return on, amongst other things, exotic products and via transactions tailored to address the risk-management challenges of particular clients or client types. As such, they have a powerful incentive to innovate.

Over time, many of the most successful innovations become mainstream, enhancing market efficiency, helping to optimise the distribution of risk, and reducing the initial supernormal returns to the innovators, who move on to the next thing; and so on. As put, that sounds like a benign story for society. And, by and large, I think it is. It does, though, have at least two corollaries.

First, investors – whether in funds or firms – should occasionally ask themselves whether they can safely extrapolate into the future the returns that they have earned in the past.

Second, investment bank innovators may from time to time face a challenge in keeping the industry's controls up to speed with what, ex post, turn out to be their most successful innovations. Imagine that, at any particular time, a firm has a portfolio of many innovations. Some will succeed, some won't. Ex ante, they won't know for sure which is which. Plausibly, it might not be economical to put controls in place for every single innovation on an assumption of 'exponential growth'. So when exponential growth occurs, controls can sometimes be left behind.

Maybe something like that helps to explain the backlog in credit derivative confirmations, which the FSA cautioned banks about a few months ago. Growth in the market has been relentless. And to the concerns about confirmations have been added concerns, amongst practitioners, about unnotified assignments of credit derivative positions, related in part to the growth of hedge fund participation in the structured credit market. If something really bad were to happen, the system would, perhaps, be less robust than otherwise if dealers were not sure about who their counterparties were, etc.

This is the type of challenge where collaboration across the industry is needed; and where individual firms' incentives are stronger if they can each be confident that their peers are taking broadly the same actions. What I have in mind is the disincentive a firm faces in being tough with a hedge fund client if they doubt their peers will take the same line. Bodies such as ISDA have a role to play here, and I understand are doing so.

### **Collective elements in atomistic markets**

So, where are the risks? They are all around us all of the time, of course. Some will crystallise. But that need not lead to disorder. Indeed, in most circumstances, global capital markets are deep and liquid enough – having a sufficiently wide range of participants able to trade with each other, and with different risk appetites and different actual risk exposures – to absorb shocks. But history suggests that strains can appear at times. And as the system develops, we need to be alive to whether cracks might show up in new places or old weaknesses manifest themselves in new ways.

The two challenges I have sketched out for today's markets – the incidence, now and then, of structural short option positions amongst short-term traders; and of controls occasionally lagging behind innovations – have a common feature. They both entail understanding markets as something more than the positions of atomistic agents. In the first case, market participants have an interest in factoring into their risk management an assessment of whether a market has structurally imbalanced option (or option-like) positions. In the second case, market participants have an interest in working together to establish robust practices and infrastructure when a particular innovation takes off.

Many risk managers are, of course, well seized of this. Let's hope they are empowered too. As practitioners, you can, and should, play a part in buttressing the system – by continuing to innovate, and by factoring collective outcomes into your private calculus and risk management.