

Macrofinancial risk

A valuable synthesis of financial theory and macroeconomics appears to be emerging. This could enrich both areas, says David Rowe

For about 2,000 years, the disciplines of geometry and algebra existed as two parallel but totally separate lines of intellectual inquiry. Sometime in the 1630s, Rene Descartes visualised plotting solutions to long-recognised algebraic relationships as sets of points on a two dimensional grid. Suddenly, these two apparently distinct patterns of thought were recognised as different views of a common fundamental reality. Something similar may be happening to financial theory and macroeconomics.

Despite its dramatic advances in the past 35 years, finance has often been viewed with some disdain by traditional economists.¹ That may be about to change in a significant way. As many readers of this column know, I spent a third of my career as a practicing macroeconomic model builder and forecaster before shifting into financial risk management in the mid-1980s. As a result, a convergence of these two fields holds a special fascination for me.

One of the things I remember well about large macroeconomic models was the difficulty of getting them to generate the amplitude of cyclicalities that is observed historically. In a recent book entitled *Macrofinancial Risk Analysis*,² Dale Gray and Samuel Malone offer a compelling explanation for this difficulty. They argue traditional macro models focus on flow variables with significant autocorrelation, while conspicuously omitting risk exposures from balance sheet revaluations. In particular, these models ignore default risk and behavioural responses to changes in default likelihood that can generate dynamically non-linear responses.

When I made the transition from macroeconomics to financial risk management, I was struck by the dramatic difference in focus between the two fields.

Where macroeconomics took a broad structural view, financial risk management tended to be extremely micro-focused. Analysis consisted primarily of applying statistical techniques to time series of varying length for a variety of market data. The resulting estimates of volatility and correlation were employed to simulate distributional performance for more complex portfolios.

Often, however, the historical data sets were fairly short, with five years being considered quite an extensive historical sample. In fact, shifting short-term volatility means very short samples often produced better value-at-risk

estimates than longer samples when tracked against the next day's profit and loss. All this tended to accentuate the narrow micro-focus of financial risk estimation.

What Gray and Malone develop is the beginning of a model in which major economic sectors (for example, households, governments, central banks, commercial banks, insurance companies, pension funds, non-financial corporations and the rest of the world) have balance sheets with both physical and financial assets. In such a system, the financial liabilities of one sector are financial assets of other sectors. The important point they make is that, by focusing on certainty equivalent values and ignoring asset value volatility and possible default risk, macroeconomics has omitted an essential mechanism for "risk transmission between sectors and the behavioural nonlinearities to which these features give rise".³

The authors emphasise the directionality of their contribution is first from finance and risk management to macroeconomics. But they emphasise it also offers potential insights for financial activities and decisions. Some of these are tied to assessing stochastic price processes relative to some threshold or barrier. This is a standard concept for those familiar with the Merton model of corporate default. Gray and Malone, however, argue it can be used to assess broader issues such as the likelihood of a devaluation of a pegged currency or a sovereign debt repudiation.

Another less formal benefit of the synthesis described above may be to force financial risk managers to devote more time to broader structural thinking informed by a much longer historical perspective. Examination of US house prices over the past 30 years shows a number of significant regional declines. While there had not been a broad national decline in house prices since the Great Depression, these regional declines should have given pause to those who insisted house prices never fall.

The huge growth in the volume of subprime mortgages also should have been a warning. It could logically magnify the impact of an initial downturn, causing above average foreclosures and forced sales that trigger further price declines in a classic example of a self-referential vicious circle. If Gray and Malone stimulate more structural thinking on the part of financial risk managers, even of this broadly qualitative kind, they will have made another valuable contribution. ■

¹ Steve Ross tells of one macroeconomist who once claimed that "finance is to economics as osteopathy is to medicine". (For fans of holistic health treatment, it should be noted that this was intended as a put-down.)

² Gray, Dale and Malone, Samuel, *Macrofinancial Risk Analysis*, John Wiley & Sons, 2008. A related working paper by Dale Gray, Robert Merton and Zvi Brodie can be found at www.hbs.edu/research/pdf/09-015.pdf

³ *Ibid*, p15

David Rowe is executive vice-president for risk management at SunGard. Email: david.rowe@sungard.com. Blog: www.sungard.com/blogs/riskmanagement