

Banking regulation and model risk

After more than 15 years of working in a bank in India, my employer posted me to its London branch, back in 1973. I still remember one of the first cultural shocks I had: the vast difference between the style of regulatory prescriptions between the Bank of England and the Reserve Bank of India. The former practiced principles-based regulation; the latter followed a detailed rules-based approach. Perhaps this was one reason why, even in the 1970s, despite exchange controls similar to India's, London was the premier international banking centre. Global banking regulation, including in the UK, is now not just rule-based, but mathematical model based.

While the next crisis will show how effective this approach is, it has already given birth to "*model risk*" in addition to the traditional credit, market and operations risks which any bank or financial intermediary faces. Many central banks have now issued supervisory guidance on model risk management. One example of model risk is mis-specification of data. In recent years, several major banks have come across highly risky positions in their trading books, of which they were not aware until the losses reached billions of dollars. Perhaps the most famous case is J.P. Morgan's \$ 6.2 bn loss in the "London Whale" case which came to light in 2012.

This apart, researchers have also found that the so-called extreme value theory, used for estimating the "tail risks", is less accurate than the traditional method based on Student's 't' distribution, something I had studied back in the 1950s in my post-graduate course in Statistics, when the extreme value theory was just being developed. Researchers have also found that the "expected shortfall" method for estimating the market risk in the trading book, which is to be implemented from 2019, is even less reliable than the value at risk (VaR) models which failed so badly during the 2008 crisis. Basle itself is dissatisfied with the variations in results from banks' internal models, particularly for measuring operations risk, and this may well lead to all banks being required to use the so-called "standard measurement approach (SMA)", prescribed by Basle. With such an approach, are banking supervisors taking too much responsibility on themselves?

One fallout of the Basle III regulatory approach is that financial institutions are anxious to avoid being designated as “systemically important” (SIFIs), which leads to even higher capital and other regulatory requirements. In the US, recently GE Capital managed to avoid being so designated and Metropolitan Life, an insurance company, sued to get the SIFI designation rescinded in a court of law. One unintended corollary of the rules/models based approach to regulation could well be that bankers and lawyers would need to “innovate” new ways of getting around the regulations!

There are several reasons underlying the difficulties in developing models. The first is that, as John Plender wrote in the Financial Times (March 5th), “*many of the big shifts in macroeconomic variables are determined ultimately by unobservable and unpredictable events – for example, the oil price shocks of the 1970s, the inflationary financing of the Vietnam war, the move to monetary union in Europe.*” For emerging economies, a major macroeconomic risk is complacency about external deficits so long as capital inflows continue. All these are potential sources of banking crises: by definition, the Minsky Moments can never be predicted, nor the impact modelled.

The second limitation comes from the sheer complexity of modern banking which stretches from intermediation between the saver and the borrower, to opaque structured products, to trading/speculation – and a cultural change from relationship banking to bonus-driven transaction banking and trading.

The third, and most important, is the fact that markets depend on human reactions which, quite often are less than rational, driven more by emotions like greed and fear rather than the so-called fundamentals. Mathematical models for banking risks are based on theories of financial economics, which in turn assume rationality of participants, the law of diminishing utility, etc. As an article on *aeon.co* argued “*Economists point to mathematical rigour underlying their work to claim legitimacy. But then, for a long time, so did astrologers.*” In a different vein, as Richard Feynman the Nobel Prize winning physicist, wrote “*Imagine how much harder physics would be if electrons had feelings*”. Unfortunately, human beings, the “electrons” underlying financial markets, do have them.

Given the crucial role of banks in any modern economy, in a crisis, the tax payers/governments may inevitably have to bear the costs, even after Basle III.

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