

## The Merits of Integrated Risk Management

World-renowned derivatives expert **John Hull**, the Rotman School's Maple Financial Group Chair in Derivatives and Risk Management, kicked off the 46th session of the *Rotman Integrative Thinking Seminar Series* in November by explaining the three types of risk faced by all financial institutions: market risk, credit risk, and operational risk. "In commercial banking, credit risk is the biggest risk; in investment banking, it's market risk; and in asset management, it's operational risk." Understanding these different types of risk and how they are integrated is the key to successful risk management for a large financial institution, he says.

Prof. Hull's presentation was timely: the new Basel II regulatory framework for banks has now been finalized, and will be implemented in 2007. It includes more sophisticated rules for calculating capital for credit risk, as well as a new capital charge for operational risk. Basel II encourages a bank to produce its own estimate of the capital it requires. This estimate, known as 'economic capital', is liable to be different from the bank's Basel II regulatory capital requirement. "A financial institution sets a confidence level, say 99.9 per cent or 99.97 per cent; it then estimates a 'worst-case' loss that will not be exceeded during one year with the chosen confidence level. Economic capital equals the difference between this worst case loss and the expected loss," he explained.

Prof. Hull went on to point out that a financial institution will typically calculate economic capital for different types of risk and different business units. "It is then faced with the problem of aggregating these capital estimates. One approach is to calculate the total capital as the sum of the individual capital estimates. This is the approach used by the Basel committee for determining what the regulatory capital banks are required to hold." However, it ignores the diversification benefits that accrue across risk types due to non-perfect correlation, says Prof. Hull, and is liable to overstate capital requirements by more than 40 per cent.

"An alternative is to assume that the losses from different sources have correlated normal distributions. This approach fails to capture the heaviness of the tails of the distributions of many types of loss and typically understates capital requirements by about 40 per cent."

One of the problems in aggregating credit, market and operational risks is that the underlying probability distributions are quite different. "The gains and losses from market risk are approximately-normally distributed; credit risk losses are skewed; and operational risk losses involve high-frequency, low-severity losses coupled with low-frequency, high-severity losses," he says. "As a result, they are highly skewed with very heavy tails."

Allocating economic capital to business units is an important first step to

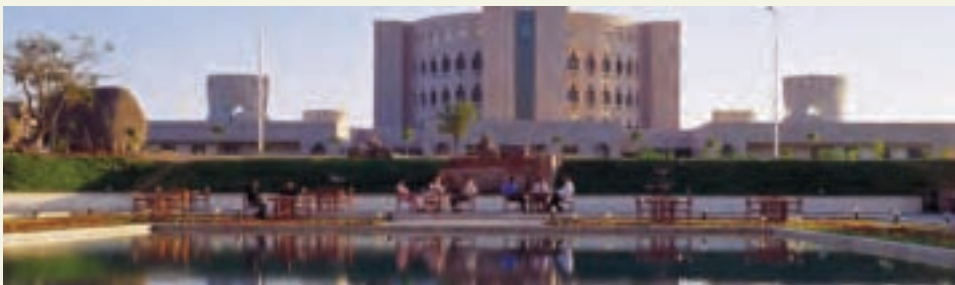


calculating 'risk-adjusted return on capital' (RAROC) so that the performance of different business units can be assessed. Professor Hull explained that it is important to allocate capital in a way that reflects the business unit's contribution to the bank's overall economic capital. One way of assessing this contribution is to calculate total economic capital with and without the business unit.

In the end, "understanding how different types of risk are integrated, and how capital should be allocated to business units, is central to the determination and effective management of risk." Prof. Hull is the author of *Options, Futures and Other Derivatives* (Prentice Hall) a seminal textbook used in universities worldwide, now in its sixth edition. His new book, *Risk Management and the Regulation of Financial Institutions* will be published in 2006.

by Karen Christensen

## Rotman Launches Exchange Program with Indian School of Business



A new partnership will enable MBA students from the Rotman School to spend a semester at the **Indian School of Business** in Hyderabad, and for students from the Indian School to study in Toronto.

Rotman is the first Canadian business school to participate in an international student exchange program with the Indian School of Business. It is hoped that the student arrangement will eventually extend to faculty exchanges and research collaboration. The agreement was