

## **Economics 872: Financial Risk Management.**

**Spring 2008**

**Frank Milne**

This course provides an overview of risk management regulations, models and procedures in private banks and other financial institutions. We begin with the basic current regulatory structures, and the models and management procedures used by firms to control and track their risks. Next we discuss more detailed recent research attempting to make the models more realistic, e.g. dealing with non-stationarities in the data, and other risks, eg operational risk. There will be a critical introduction to credit derivative models, their pricing and hedging, and their close relation to basic risky bond pricing models. The course will conclude with a brief survey of the regulation of systemic risks, liquidity risks and recent research attempting to model liquidity risk at the micro and systemic levels.

Textbooks: M.Crouhy, D.Galai, R.Mark, *Risk Management*, McGraw-Hill, 2001.

P. Jorion, *Value at Risk*, third edition, McGraw Hill 2007.

Note: both book have strengths and weaknesses. Jorion is more recent and informative on the latest market risk techniques (it is used as an “industry standard”); Crouhy is much more detailed on credit risk.

Other books that may be referenced are:

Duffie and Singleton, *Credit Risk*, Princeton University Press, 2003.

D. Lando, *Credit Risk Modelling*, Princeton University Press, 2004.

Jarrow and Turnbull, *Derivative Securities*, second edition, 2000.

L.Allen, Boudoukh and Saunders, *Understanding Market, Credit and Operational Risk*, Blackwell, 2004.

M. Cruz, *Modelling.Measuring and Hedging Operational Risk*, Wiley,2002.

C.Goodhart and G. Illing (eds.) *Financial Crises, Contagion and the Lender of Last Resort*, OUP, 2002

G.Meissner, *Credit Derivatives: Applications, Pricing and Risk Management*, Blackwell, 2005.

F.Allen and D.Gale, *Understanding Financial Crises*, OUP, 2007.

J-C Rochet, *Why Are There So Many Banking Crises?: The Politics and Policy of Bank Regulation*, Princeton University Press, 2008.

X. Freixas and J-C. Rochet, *Microeconomics of Banking*, second edition, 2008.

(There are a number of other recent books, articles and recent working papers that deal with specialized topics – I will choose an appropriate selection. The interested student should ask me for further references for deeper discussions of topics.)

**Assessment:** There will be a final examination worth 70%.

Every week there will be assignment problems to work through computational examples used in risk management. James Thompson ( [thompsonj@qed.econ.queensu.ca](mailto:thompsonj@qed.econ.queensu.ca) ) will run the tutorial to work through the computational problems. There will be three computational assignments for credit ( total 20%); and one theory assignment worth 10%.

## **Topics:**

### **The Regulatory Framework and Risk Management Basics:**

#### **1.The Need for Risk Management Systems:**

Crouhy Ch.1.

Jorion Ch.1,2

Edwards,F. “Hedge Funds and the Collapse of Long Term Capital Management”,*Journal of Economic Perspectives*, Spring, 1999, pp189-210.

Lowenstein, R. **When Genius Failed**, Random House, 2000.

Dunbar, **Inventing Money**, John Wiley, 2000.

#### **2.The Regulatory and Corporate Environment**

Crouhy Ch.2,

Jorion Chs.2,3.

#### **3.Structuring and Managing the Risk Management Function in a Bank**

Crouhy Ch.3.

Jorion Ch.3

#### **3A: A Case Study of Failure in Risk Management Function: NAB:**

*Australian Prudential Regulatory Authority, Report into irregular currency options trading at the National Australia Bank*, March 2004.

*PriceWaterhouseCoopers, Investigation into Foreign Exchange Losses at the NAB*, March 2004.

A. Comanescu, QED M.A.essay, 2004.

#### **4.The New BIS Capital Requirements for Financial Risks:**

Crouhy Ch.4

Jorion Ch.3

## **Market Risk and VaR:**

#### **5. Measuring Market Risk:The VaR Approach:**

Crouhy Ch.5.

Jorion Chs.4,5.

Allen et al. Ch.1.

## **6.Measuring Market Risk: Extensions to VaR and Testing the Models:**

Crouhy Ch.6.

Jorion Chs. 6,7, 8,9

Allen et al. Ch.2`.

## **Credit Risk:**

### **7. Credit Rating Systems:**

Crouhy Ch.7.

J. Crean, "Corporate Risk Evaluation Checklist", UofT mimeo, 2003.

### **8. Credit Migration Approach to Measuring Credit Risk:**

Crouhy Ch.8.

D&S Ch.4

### **9.. The Contingent Claim Approach to Measuring Credit Risk:**

Crouhy Ch.9.

D&S Chs. 5,6

### **10. Other Approaches:**

Crouhy Chs.10,11.

## **Hedging and Pricing Credit**

### **11.Basic Ideas: Stochastic Interest Rate Models:**

Crouhy Ch.12.

J&T Chs. 13,14,15,16.

### **12. Credit Derivatives:**

J&T Ch.18.

D&S. Chs. 8,9

Meissner, (A detailed discussion of discrete tree applications, with model summaries for the thoughtful practitioner.)

## **Other Risks:**

### **13. Liquidity Risk:**

Jorion Ch.13

### **14. Operational Risk:**

Crouhy Ch.13.

Jorion Ch.19

Allen et al. Ch.5.

M. Cruz (we will look at a selection of chapters.)

**15. Model Risk and Stress Testing:**

Crouhy Ch.15.

Jorion Chs.14, 21

**16. Systemic Risk, Liquidity Risk and Regulation ( a small selection of papers):**

C.Upper, “Contagion due to interbank credit exposures: what do we know, why do we know it, and what should we know? (2007) <http://www.bis.org/publ/work234.htm>

**Bank of England Stability Report.**

<http://www.bankofengland.co.uk/publications/fsr/2007/fsrfull0710.pdf>

Kaufman, “Lender of Last Resort: A Contemporary Perspective”, Ch.9 in Goodhart/Illing. Allen and Gale, “Financial Contagion”, Ch. 18 in Goodhart/Illing.

F.Milne, Risk Management Systems, Systemic Risk and the Credit Crisis,” March 2008, [http://www.econ.queensu.ca/faculty/milne/Risk%20Management%20Paper%20\(2008\).pdf](http://www.econ.queensu.ca/faculty/milne/Risk%20Management%20Paper%20(2008).pdf)

There is a huge literature in this area. See the books by Allen and Gale, Rochet, and Freixas and Rochet. This is a hot topic given the current credit crisis.