

PART 1: Quantitative Techniques by Adjunct Associate [Professor Richard Yeh](#) (Senior Advisor, CAMRI)

Part 1 of this course is an advanced training seminar in state-of-the-art financial management techniques, drawing on Modern Portfolio Theory. It will serve as a comprehensive real world examination of the quantitative techniques available in portfolio management, and how these might be applied to the investment management industry. Topics covered are shown in greater detail below and includes a review of methodologies for estimating parameters for **Portfolio Building Blocks**; the portfolio impact of **Estimation Errors** and the use of Bayes-Stein shrinkage and other methodologies to robustify the estimation process; the use of Monte Carlo simulations including parametric and non-parametric (Resampling) methodologies; a review of **Equilibrium Models** with particular focus on the Black-Litterman Model; **Equity Valuation & Portfolio Construction**; and dealing with **Data issues**, in particular non-synchronous and missing data using the Stambaugh methodology. Part 1 is for 2.5 days.

Topics Covered:

1. Portfolio Building Blocks

- Estimating Expected Returns
- Estimating Variance-Covariance Matrix
- Building an Efficient Frontier

2. Estimation Errors

- Impact on asset allocation
- Bayes-Stein Shrinkage
- Monte Carlo and Resampling

3. Equilibrium Models

- Capital Asset Pricing Model (CAPM)
- Estimating Beta and Risk Premia
- Black Litterman Model

4. Equity Valuation & Portfolio Construction

- Fundamental –Vs- Relative stock valuation
- Portfolio construction using different models
- Portfolio rebalancing incorporating investment views

5. Data issues

- Non-synchronous and Missing Data
- Insufficient Data and Bootstrapping
- Illiquidity and Serial Correlation

Recommended Textbooks

1. Financial Modelling, Third Edition (2008), MIT Press, by Simon Benninga
2. Investment Valuation, John Wiley & Sons (2012), by Aswath Damodaran
3. Quantitative Methods in Finance, First Edition (1997), International Thomson Business Press, by Terry Watsham and Keith Parramore

Learning Outcomes

- Practical knowledge of “real world” issues in portfolio management and how to address these in a robust and pragmatic manner
- Functional understanding of methodologies and models used in investment theory and in practice – their applications and limitations
- Hands-on computational finance with ability to build Excel models for equity valuation and portfolio implementation
- Ability to model stochastic cash flows related to investment and wealth management (probability of success under conditions of uncertainty)

Students are expected to:

- Have some experience in the use of Excel and its basic functions for financial modelling, particularly the use of array and matrix functions.
- Be able to understand and use the framework provided in Benninga’s Financial Modelling Textbook Chapters:
 - (2) Dividend Discount Model*
 - (8) Portfolio Models – Introduction*
 - (9) Calculating Efficient Portfolios with No Short Sales Restrictions*
 - (10) Computing the Variance-Covariance Matrix*
 - (11) Beta and the Security Market Line*
 - (12) Efficient Portfolios without Short Sales*
 - (13) Black-Litterman Model*
 - (22) An Introduction of Monte Carlo Methods*
 - (31) Matrices*
 - (36) – (40) Introduction to Visual Basic for Applications*
- Access, read and digest numerous papers published by academics and practitioners in financial journals and websites.

PART 2: Fundamental Investing in Asia by [Professor Robert Lewis](#) (Member, Advisory Council, CAMRI)

Part 2 of this course will highlight the skills necessary from a theoretical and practical standpoint for investing using a "fundamental" approach. The course aims to apply traditional Graham & Dodd "deep value" investment theory with the practical challenges of investing in Asian equity markets. Participants will gain practical experience in fundamental research techniques including interviewing company management, and doing company and sector due diligence to determine corporate governance strengths, quality of accounting information, fraud detection, etc., and financial statement modelling. Part 2 is for 1.5 days.

Topics Covered:

1. Business Model

- Business model canvas
- Deconstruct several business models using this tool
- Using the lens of an investor
- Enhance the model with real market information

2. Operating and Financial Characteristics

- Analyse income statement, balance sheet and cash flow statements

3. Historic Financial and Qualitative Information

- Reconstruct a historical narrative with the most important factors that influenced the company's value leading up to today

4. Build A Robust Company Financial Model

- Construct robust and relevant financial models incorporating operating data, macroeconomic estimates and competitive analyses

5. Due Diligence

- Gather company and industry information from primary sources, and learn about biases in secondary data

6. Model the Future and Construct A Forward Narrative

- Construct a forward narrative with three key points that frames the investment rationale
- Reframing and re-evaluating the forward investment thesis depending on changes in information and outlooks

7. Valuation of the Assets and Earnings

- Learn valuation tools for assets and earnings of the company

- Consider different asset valuation techniques, their uses and pitfalls
- Learn different methodologies for valuing a stream of earnings

8. Margin of Safety

- Consider the gap between the intrinsic value and the market value
- Concepts - margin of safety and economic “moats”
- Recognize value opportunities where the intrinsic value diverges from the market value

Learning Outcomes

- Gain practical experience in valuing a business using fundamental research techniques
- Deciphering a company’s business model
- Interviewing company management
- Conducting company and sector due diligence
- Creating a historical investment narrative
- Modelling income statement and balance sheet inputs
- Forecasting forward looking scenarios
- Applying valuation techniques in order to formulate a “value-based” investment thesis

PART 3: Fixed Income and Currencies ("FIC") by [Professor Ganesh Ramchandran](#)

We provide insights into interest rate, FX and credit markets and products, from an industry insider's perspective. The focus will be on valuation and risk management in "FIC", with real-life examples from the banking and hedge fund world. The training will emphasize practical case study applications, including asset-liability management, cross currency swaps, and an in-depth analysis of infamous derivative "accidents" in history. Part 3 is for 1.5 days.

Topics Covered:

1. FIC products / instruments

- Interest Rates – Bonds/Futures/FRA/Swaps/Swaptions
- Foreign Exchange – Currency Forwards /Cross Currency Swaps/Options
- Credit – Bonds/Single Name CDS/Indices/First to Default Baskets/Credit Options

2. Real Life Trades / Strategies

- Types of Strategies - Directional / Relative Value
- Execution Issues – cheapest way to implement /sizing /P&L target
- Risks – how do Greeks behave
- Typical risk limit structure in FIC in bank/hedge fund
- Case study of structured product in FIC

3. Pricing / Valuation

- Qualitative - intuitive first principles based
- Model based
 - i. Rates – Zero Curve/ Term Structure approach
 - ii. Foreign Exchange – Volatility smile
 - iii. Credit – Merton (structural) approach / reduced-form (CDS/CDO)
- Pitfalls of over-reliance on models

4. Asset Liability Management (ALM)

- Applications across pensions/insurance/asset managers
- Case study –Worked out examples of interest rate and credit immunization
- ALM in a Treasury context - liquidity risk / stress testing
- Qualitative vs Quantitative ALM modelling
- Enterprise risk management – integrated approach to risk and asset allocation

5. Derivative Debacles in FIC

- Great Financial Crisis
- Hedge Funds - LTCM / Bernie Madoff / SAC /others
- Notable disasters in banks – SocGen / UBS / Goldman Sachs / Barings / Daiwa etc

- Which risk management principles violated – avoidable in future?

Reading Materials

1. Industry product pricing / primers to be distributed
2. Hull / Rebonato / Schoenbucher (one textbook at least for rates/fx/credit)
3. Pricing term sheets

Learning Outcomes

- Solid understanding of spectrum of products across FIC asset classes – pricing, trading and risk
- Knowledge of different Asset Liability Management approaches across different financial institutions and need for enterprise risk management
- Insight into historical risk mis-management episodes across banks and hedge funds
- Intuition on pricing and trading from industry insider's perspective – combining abstract finance theory with "common sense"

Students are expected to:

- Know how to price interest rate, credit and FX products from first principles, and understand nuances of complicated pricing models
- Using Bloomberg, calculate yield curve hedging strategies and understand risk sensitivities on real life derivative trades
- Select their favourite risk management "accident" and produce a case study analysing all aspects of the underlying trade: – how to price the underlying product/strategy, identify the risk principle(s) that led to the disaster and furnish concrete measures to prevent a repeat.
- Understand how Black Litterman (as taught by Professor Richard Yeh) and portfolio approaches can be applied in the ALM world

PART 4: Securities Valuation, Risk & Portfolio Management by [Professor Joseph Cherian](#) (Director, CAMRI)

Part 4 of this course serves as a comprehensive summary of the real world examination of the quantitative, fundamental, behavioural, and model-based approaches utilized for performing securities valuation & investing in the financial industry. Major topics covered include Relative Valuation, building Multifactor Models, Liquidity, Behavioural Finance, Portfolio & Risk Management, and Value Enhancement Strategies. Lectures will include hands-on lab projects using Bloomberg and Barra resources, interaction with practitioners from the industry, and real-life portfolio management examples utilizing various financial applications & tools. Part 4 is for 1 day.

Topics Covered:

1. Multifactor Models (MFM) in Portfolio Management

- Economic rationale for MFM
- Types of models – APT, Relative Valuation, Fundamental, Asia versus US
- Diversification of themes
- Orthogonalization
- Testing for efficacy, monotonicity, transitions, downside risk

2. Behavioural Finance: The Role of Investor Psychology & Decision Heuristics

Investor psychology, imperfections of the human mind, biases, etc., lead to mistakes being committed across the board. Examples include anchoring, framing, familiarity, mental accounting, overconfidence, confirmation and hindsight bias, herding, positive feedback trading (momentum)

- Anchoring – decisions made using initial or most available information
- Framing – decisions conditioned on positive or negative frames presented
- Prospect theory – disutility from losses far greater than utility of gains (loss aversion)
- Mental accounting – financial accounting based on subjective criteria, e.g., money jar for vacations paid for using high interest (revolving) credit cards
- Overconfidence – leveraging and taking unusual risks in bull markets, attributing one's stock market gains to skill
- Herding – the madness of crowds, viz. factually unsubstantiated actions taken in the same direction, just because others are
- Which leads to momentum or positive feedback trading => correlation in stock returns, price bubbles, overreaction to news, flight-to-quality (panic)

3. Liquidity and Asset Prices

- How we define and measure liquidity
- How liquidity affects valuation of asset prices
- Flight to liquidity versus flight to quality

4. Hedge funds and Alternative Investments

- Investment strategies
- Performance and risk management – Asia versus US

Reading Materials

1. “Worry-free Inflation-Indexing for Sovereigns: How Governments Can Effectively Deliver Inflation-Indexed Returns to Their Citizens and Retirees,” (Z. Bodie, J. Cherian and W.K. Chua), Life-cycle Investing: Financial Education and Consumer Protection (CFA Institute), The Research Foundation of Chartered Financial Analysts (CFA) Institute Publications Series, 2012, Z. Bodie, L.B. Siegel and L. Stanton (Editors)
2. “A Tail of Two Cities: On the Downside Risk and Loss Profile of Asian and North American Hedge Funds,” 2014, (J. Cherian, C. Kon and W. Weng), CAMRI Working Paper, NUS Business School (SSRN Abstract ID 2520354; <http://ssrn.com/abstract=2520354>)
3. “Liquidity and Portfolio Management,” (J. Cherian, S. Mahanti and M. Subrahmanyam), March 2012, CAMRI Working Paper, NUS Business School
4. Investment Valuation, John Wiley & Sons (2012), by Aswath Damodaran
5. CAMRI's guide for new users of Bloomberg is available by [clicking here](#). More [Bloomberg resources](#) are available here for you to download
6. [Barra resources](#) are available for you to download (password-protected). You can also view the [Barra Training Video](#). And click here for a [CAMRI-developed Guide to Barra Aegis Portfolio Manager](#) and a [CAMRI-developed Guide to Barra Aegis Performance Analyst](#)

Learning Outcomes

- In-depth knowledge of distinct security valuation approaches
- Methodologies & models used in theory and in practice - Relative Valuation, Multifactor Models, and Value Enhancement Strategies, Behavioural Finance.
- How liquidity affects valuation
- Ability to value various assets and stochastic cash flows related to the firm (decision-making under conditions of uncertainty)
- Hands-on computational finance, risk & portfolio management, and trading abilities

Students are expected to:

- Research, write, and publish investment reports (preferably on companies with limited research analyst coverage) using both quantitative and fundamental techniques
- Perform live & backtested portfolio investment strategies to develop equity research and stock-picking skills using financial applications such as Bloomberg and Barra
- Perform portfolio optimization and risk management routines and analysis
- Explore the latest thinking in investment management systems and processes

Part 5: Current Issues in the Global Economy Affecting Portfolio Management by [Professor Kim Sun Bae](#) (former Chief Economist – Asia, Goldman Sachs)

Following the Global Financial Crisis, the economic environment has been changing dramatically while proactive central banks and regulators have had an unprecedented impact on the global marketplace. This part of the course highlights some of the key changes unfolding in the macroeconomic and policy front, both globally and within Asia, which will shape the investment landscape over the near- to medium-term. Topics to be covered include Prospects and risks of monetary policy “normalization” in the US; Rebalancing in China and implications for Asia and the world; and Financial regulation post global financial crisis. The lectures will apply some of the tools (models) of macroeconomics and international finance in framing these issues, particularly as they impact the investment landscape. Part 5 is for half a day.

Topics Covered:

- 1. Prospects and risks of monetary policy “normalisation” in the US**
 - Equilibrium (“natural”) rate of interest and secular stagnation
 - Policy spillover in a multi-speed world
 - Is the strong dollar good for the world?

- 2. Structural change in China and implications for Asia and the world**
 - Emergent China and regional economic integration in Asia
 - Rebalancing the driver of China’s growth
 - Financial sector reforms in China and the rise of RMB

- 3. Financial regulations in Asia post global financial crisis**
 - Business cycles vs. financial cycles
 - The anatomy of financial crisis and its aftermath
 - Early warning signals and macro-prudential tools

Reading Materials

1. The Economist, Free Exchange, “A Natural Long-Term Rate” (26/10/2013)
2. Gavyn Davies, “The Future for Real Interest Rates” FT (06/04/2014)
3. The Economist, Free Exchange, “Is it Secular or is it Stagnation: What Secular Stagnation Means for Interest Rates” (19/06/2014)
4. The Economist (2014). “Dollar imperialism, Part 1: Emerging marks,” February 3
5. The Economist (2014). “Dollar imperialism, Part 2: Unitarian economists,” February 18
6. IMF (2014). Chapter 2: Spillover from Unwinding Monetary Support in Advanced Economies, in Spillover Report, July, pp. 26-55
7. IMF (2014). “Preparing for the Risks Ahead,” in Chapter 1, Regional Economic Outlook: Asia and Pacific, April, pp. 14-18
8. IMF, “The Evolution of Trade in Emerging Asia,” Regional Economic Outlook: Asia & Pacific (October 2007)

9. Paul F. Gruenwald, "The Unpleasant Math of Raising China's Consumption-to-GDP Ratio," Standard & Poor's Economic Research (November 21, 2013)
10. Ahuja, A. et. al., "Is China Rebalancing? Implications for Asia," Ch. 4, *IMF Regional Economic Outlook: Asia and Pacific* (April 2012)
11. IMF (2014). "How Will China's Reform Shape China and Asia?" *Regional Economic Outlook: Asia and Pacific*, April, pp. 27-29
12. Frankel, Jeffrey, "The Rise of the Renminbi as International Currency: Historical Precedents" *VOX* (10/10/2011)
13. Fratzscher, M. and A. Mehl, "China Dominance Hypothesis and the Emergence of a Tripolar Global Currency System" *VOX* (15/12/2011)
14. Borio, Claudio (2013). "Macroeconomics and the Financial Cycle: Hamlet Without the Prince?" *Vox*, February 2
15. Borio, Claudio (2009). "The Macroprudential Approach to Regulation and Supervision," *Vox*, April 14
16. Davis, Gavyn (2014). "Macro Pru is no Panacea," *FT blogs*, May 11