



# **EXAMINATION SYLLABUS**

- 1. Financial Accounting and Financial Statement Analysis**
- 2. Corporate Finance**
- 3. Equity Valuation and Analysis**
- 4. Economics**
- 5. Fixed Income Valuation and Analysis**
- 6. Derivative Valuation and Analysis**
- 7. Portfolio Management**

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## **1. Glossary**

The CIA International Examinations comprise two levels: a Foundation level Examination and a Final level Examination.

The Foundation Examination will examine all topic areas marked with the indication Fo in the present Syllabus. It will contain multiple choice, calculation and essay type questions which assess the basic knowledge and analytical skills of candidates.

The Final Examination concerns all the subjects described in the current Syllabus, i.e. all topic areas marked with the indication Fi. Material that is examinable at the Foundation level can also be examined at the Final level. The Final Examination will examine across all topic areas and will contain full and mini- case study questions, together with in-depth essay or discursive questions together with some structured computational questions which assess the more advanced knowledge and synthetic analytical skills of candidates.

## **2. Introduction: Quantitative Analysis and Statistics**

### **Broad Learning Objectives**

This pre-requisite topic will not be examined as such, but a sufficient understanding is necessary to read the manuals and other articles or finance books without being brought to a halt at the first formula. It is necessary to understand the various mathematical concepts, statistical concepts and methods and numerical procedures and to apply these to the different modules.

**Algebra:** Financial mathematics language; Greek letters; Basic terminology (constants, variables, coefficients); Algebraic operations, algebraic transformations; Equations (linear, inequalities, system of equations with one unknown, with two unknowns); Indexed notations, sums, products; Simple, compounded, continuous returns.

**Functions:** Graphs of a function (slope, x/y-axis, intercept); Constant, linear, inverse, quadratic, power, exponential, logarithmic functions.

**Derivatives and Integrals:** First, second, partial derivative; Concave, convex functions, inflection point; Integrals.

**Statistics and probabilities:** Graphics (pie chart, histogram, diagram; quantile, quartile, percentile, mean, mode, median; skewness); Covariance, correlation coefficient; Linear regressions (simple, multiple); Concept of probability; Simple, weighted, arithmetic, geometrical means; Dispersion measures (for example, variance, standard deviation and shortfall); Expected value; Binomial and normal distribution; Statistical tests.

### **3. Financial Accounting and Financial Statement Analysis**

#### **Broad Learning Objectives**

The basic principles and standards that underpin the preparation of financial statements should be understood, together with the various features of the income statements and balance sheets. The usage and analysis of financial statement related information receives a particular emphasis and candidates should develop strong skills in these dimensions. A wide range of analytic tools and applications should be understood, including income versus cash flow, various ratio analyses (such as EPS, profitability, leverage), time series analyses, common size statements and Dupont analysis and their application in practical settings well known and understood. Candidates should have a good understanding of the important topics of foreign currency translation and the consolidation of financial statements. The important valuation related topic of financial projections is also covered.

#### **1 Principles and Standards**

<u>1.1</u>	<u>The financial reporting environment</u>	Fo/Fi
1.1.1	The financial statements	
1.1.2	Financial reporting issues	
<u>1.2</u>	<u>Framework for the preparation and presentation of financial statements</u>	Fo/Fi
1.2.1	Objective of financial statements	
1.2.2	Accounting conventions	
1.2.3	Fundamental definitions	
1.2.4	Criteria for accounting recognition	
<u>1.3</u>	<u>Statement of cash flows</u>	Fo/Fi
1.3.1	Rationale for the statement of cash flows	
1.3.2	Relation between income flows and cash flows	

#### **2 Income Statement and Foreign Currency Transactions**

<u>2.1</u>	<u>Revenue recognition</u>	Fo/Fi
2.1.1	Revenues from customers	
2.1.2	Criteria for expense recognition	
2.1.3	Accounting for stock options and similar benefits	
<u>2.2</u>	<u>Foreign currency transactions</u>	Fo/Fi
2.2.1	Foreign currency transactions	
2.2.2	The translation of financial statements into a foreign currency	
2.2.3	Hyperinflationary economies	

<b>3</b>	<b>Balance Sheet</b>	
<u>3.1</u>	<u>Assets</u>	Fo/Fi
3.1.1	Property, plant and equipment	
3.1.2	Investment property	
3.1.3	Intangible assets	
3.1.4	Inventories	
3.1.5	Accounts receivable	
3.1.6	Cash and cash equivalents	
3.1.7	Impairment of assets	
3.1.8	Financial assets	
<u>3.2</u>	<u>Liabilities</u>	Fo/Fi
3.2.1	Bonds and other financial liabilities	
3.2.2	Compound financial instruments	
3.2.3	Off balance sheet financing agreements	
3.2.4	Leases	
3.2.5	Borrowing costs	
3.2.6	Retirement benefits	
3.2.7	Income taxes	
<u>3.3</u>	<u>Shareholders' Equity</u>	Fo/Fi
3.3.1	Issuance of capital stock	
3.3.2	Acquisition and sale of treasury shares	
3.3.3	Accounting for dividends	
3.3.4	Other changes in retained earnings	
<u>3.4</u>	<u>Provisions</u>	Fo/Fi
3.4.1	Conditions for the recognition of provisions	
3.4.2	Contingent liabilities	
<b>4</b>	<b>Consolidated Financial Statements</b>	
<u>4.1</u>	<u>Mergers and acquisitions</u>	Fi
4.1.1	Acquisitions	
4.1.2	Mergers	
<u>4.2</u>	<u>Consolidated financial statements</u>	Fi
4.2.1	The scope of consolidation	
4.2.2	The consolidation methods	
4.2.3	The nature of the difference arising from consolidation	
4.2.4	Uses of each method	
4.2.5	The consolidation procedure	
4.2.6	Analysis of the difference arising from initial consolidation	
4.2.7	Valuing minority interests	
4.2.8	The treatment of Goodwill	

<b>5</b>	<b>Financial Analysis</b>	
<u>5.1</u>	<u>Introduction to Financial Analysis and the related chapters on Corporate Finance and Equity Analysis</u>	Fo/Fi
<u>5.2</u>	<u>Income vs. Cash Flow</u>	Fo/Fi
	5.2.1 Relationship between income and cash flow from operations	
	5.2.2 Income and cash flow at various stages of the life cycle	
<u>5.3</u>	<u>Quality of earnings, earnings management</u>	Fo/Fi
	5.3.1 Data issues when analysing financial statements	
	5.3.2 Significance and implications of alternative accounting policies on the financial statements	
<u>5.4</u>	<u>Earnings per share</u>	Fo/Fi
	5.4.1 Basic earnings per share	
	5.4.2 Diluted earnings per share	
	5.4.3 Using EPS to value firms	
	5.4.4 Criticism of EPS	
<u>5.5</u>	<u>Segment reporting</u>	Fi
	5.5.1 Segment identification	
	5.5.2 Disclosure requirements	
	5.5.3 Using segment information for the analysis	
<u>5.6</u>	<u>Interim reporting</u>	Fi
<u>5.7</u>	<u>Non-GAAP financial measures</u>	Fi
	5.7.1 Adjusted net income / operating income	
	5.7.2 EBITDA	
	5.7.3 Free cash flow	
	5.7.4 Net debt	
	5.7.5 Organic sales	
	5.7.6 New orders, backlog, book-to-bill	
<b>6</b>	<b>Major Financial Flows and Accounting Adjustments</b>	
<u>6.1</u>	<u>Shareholder vision: net income and earnings per share</u>	Fo/Fi
	6.1.1 Basic earnings per share	
	6.1.2 Diluted earnings per share	
<u>6.2</u>	<u>Management vision: investments and free cash flow</u>	Fo/Fi
	6.2.1 Modigliani Miller	
	6.2.2 Basic example	
	6.2.3 Global analytical table	
	6.2.4 Non-cash charges	

<u>6.3</u>	<u>Reconciliation of the two approaches</u>	Fo/Fi
6.3.1	General principles	
6.3.2	Operating cash flow and net income (shareholder approach)	
6.3.3	Operating cash flow (shareholder approach) and FCFF (MM approach)	
6.3.4	EBITDA and FCFF (MM approach)	
<u>6.4</u>	<u>Published figures and accounting adjustments</u>	Fi
6.4.1	Entries that give a false image of the company	
6.4.2	Accounting definitions not recognised by international standards	
6.4.3	Rewriting of entries in the case of different accounting standards	
6.4.4	Capitalisation of research and development costs	
<u>6.5</u>	<u>Presentation of historic figures</u>	Fo/Fi
6.5.1	Time series analysis	
6.5.2	Common size analysis	
<b>7</b>	<b>Analysis of Management Performance</b>	
<u>7.1</u>	<u>Why use financial ratios?</u>	Fo/Fi
<u>7.2</u>	<u>Operating risk measurement</u>	Fo/Fi
7.2.1	Measurement of management efficiency over the operating cycle (gross margin, operating margin, net margin, asset turnover, inventory outstanding period, collection period, payables outstanding period)	
7.2.2	Capital profitability ratios (ROA, ROCE, CFROI, ROE)	
<u>7.3</u>	<u>Measurement of financial risk</u>	Fo/Fi
7.3.1	Liquidity ratios (current ratio, quick ratio, cash ratio)	
7.3.2	Solvency ratios (average interest rate, net debt, capital structure ratio, total debt to equity ratio, long-term debt to equity ratio, interest coverage ratio, operating cash flow to cash interest cost, operating cash flow to liabilities)	
7.3.3	Credit risk (rating agencies, credit default swaps)	Fi
<u>7.4</u>	<u>Key sectorial ratios and metrics</u>	Fi
7.4.1	Industrial	
7.4.2	Oil and gas	
7.4.3	Consumer	
7.4.4	Healthcare	
7.4.5	Technology	
7.4.6	Banks	
7.4.7	Utilities	
<u>7.5</u>	<u>Sensitivity analysis</u>	Fi
7.5.1	Operating income sensitivity	
7.5.2	Financial leverage sensitivity	
7.5.3	Net income sensitivity	



<u>7.6</u>	<u>Quality of earnings as a measure of accounting risk</u>	Fi
7.6.1	Financial warnings signs	
7.6.2	Non-financial signs (change of accountants, sudden departure of CFO, delay in statements)	
7.6.3	Revenue-related warning signs	
7.6.4	Beneish M Score	
<u>7.7</u>	<u>Analysis of the business environment</u>	Fi
7.7.1	A vision of the company beyond figures	
7.7.2	Qualitative analysis of the industry	
7.7.3	Qualitative analysis of the company	
<b>8</b>	<b>Financial Projections</b>	
<u>8.1</u>	<u>Different projection formats</u>	Fi
8.1.1	Comprehensive format	
8.1.2	Common size percentage	
8.1.3	Growth rates method	
8.1.4	Projections based on value drivers	
<u>8.2</u>	<u>Estimated value drivers of the company</u>	Fi
8.2.1	Sales forecast	
8.2.2	Investment projections (net working capital and capital expenditure)	
8.2.3	Other internal value drivers	
8.2.4	External value drivers	
<u>8.3</u>	<u>Recurring/non-recurring entries</u>	
8.3.1	Recurring accounting entries	
8.3.2	Non-recurring accounting entries	
<u>8.4</u>	<u>Additional information (quarterly, divisions)</u>	Fi
8.4.1	Projections based on interim reporting	
8.4.2	Projections based on segment reporting	

## 4. Corporate Finance

### Broad Learning Objectives

Candidates should understand the fundamental component parts of corporate finance, such as objectives, valuation, discounted cash flow and capital budgeting within a corporate setting, together with decision making, both from a short term and long term perspective. The important financial decisions together with the underlying theories associated with capital structure, dividend policy and mergers and acquisitions should be understood in some detail within this topic area together with their applications to practical settings. Given the global nature of the CIIA designation, an in depth knowledge of international corporate finance should be developed and applied. The topic area concludes with a review of the organisation of value creation within a corporate setting.

<b>1</b>	<b>Corporate Finance and Value Creation</b>	Fo/Fi
<b>2</b>	<b>Investment Mechanisms</b>	
<u>2.1</u>	<u>Basics of cash flow analysis</u>	Fo/Fi
<u>2.2</u>	<u>The net initial investment (NINV)</u>	Fo/Fi
	2.2.1 Replacement projects	
	2.2.2 Expansion project	
<u>2.3</u>	<u>Operating cash flows</u>	Fo/Fi
	2.3.1 Depreciation	
	2.3.2 Net operating cash flows	
<u>2.4</u>	<u>Terminal cash flows</u>	Fo/Fi
<u>2.5</u>	<u>Future value of cash flows</u>	Fo/Fi
	2.5.1 Perpetuity	
	2.5.2 Annuity	
	2.5.3 Constant growth model	
	2.5.4 A stream of irregular cash flow	
<b>3</b>	<b>Investment Discount Rate</b>	
<u>3.1</u>	<u>Weighted average cost of capital (WACC)</u>	Fo/Fi
	3.1.1 Cost of debt	
	3.1.2 The cost of equity capital	
	3.1.3 Weighted average cost of capital (WACC)	
	3.1.4 International capital budgeting	
<u>3.2</u>	<u>Optimisation of weighted average cost of capital</u>	Fo/Fi
	3.2.1 Leverage and the value of the firm	

<u>3.3</u>	<u>Dividend policy</u>	Fo/Fi
3.3.1	Types of dividends	
3.3.2	Repurchase of stock	
3.3.3	Irrelevance theorem	
3.3.4	The clientele effect	
3.3.5	Signalling model	
3.3.6	Dividend policy in local markets	
<b>4</b>	<b>Investment Decision Criteria</b>	
<u>4.1</u>	<u>Major methods</u>	Fo/Fi
4.1.1	Net present value (NPV)	
4.1.2	Internal rate of return (IRR)	
4.1.3	Payback rules	
<u>4.2</u>	<u>Capital budgeting</u>	Fo/Fi
4.2.1	Method for ranking investment proposals	
4.2.2	Capital resource rationing	
4.2.3	Common pitfalls	
<u>4.3</u>	<u>The link between the value of an investment and enterprise value</u>	Fo/Fi
<b>5</b>	<b>Mergers and Acquisitions</b>	
<u>5.1</u>	<u>Valuation issues</u>	Fi
5.1.1	Valuation of the target	
5.1.2	Motives for mergers	
<u>5.2</u>	<u>Forms of acquisition</u>	Fi
5.2.1	Takeovers	
5.2.2	Approved acquisitions	
5.2.3	Creeping take-overs	
5.2.4	Eliminating minority interests	
5.2.5	Going private and capital restructuring operations	
5.2.6	Leverage buyout (LBO)	
5.2.7	Management buyout (MBO)	
5.2.8	Management buy in (MBI)	
<u>5.3</u>	<u>Strategies for the acquirer</u>	Fi
5.3.1	Aggressive or agreed	
<u>5.4</u>	<u>Defensive strategies</u>	Fi
5.4.1	Pre-emptive versus reactive	
5.4.2	Pre-emptive (long-term) strategies	
5.4.3	Pre-emptive (short-term) strategies	
<u>5.5</u>	<u>Liquidation and reorganisation</u>	Fi
5.5.1	Bankruptcy liquidation	
5.5.2	Bankruptcy reorganisation	

<b>6</b>	<b>Project Financing</b>	
<u>6.1</u>	<u>Long-term financing</u>	Fi
6.1.1	Project evaluation from the investors' perspective	
6.1.2	Project evaluation from the lenders' perspective	
<u>6.2</u>	<u>Leasing</u>	Fi
6.2.1	Fundamentals of leasing	
6.2.2	Motives for leasing	
6.2.3	Accounting and tax consequences of leasing	
6.2.4	Valuing leases from the lessee's perspective	
6.2.5	Valuing leases from the lessor's perspective	
<u>6.3</u>	<u>Short-term finance decisions</u>	Fi
6.3.1.	Short-term financing	
6.3.2	Cash management	
6.3.3	Short-term lending and borrowing	
<b>7</b>	<b>The Organisation of Value Creation</b>	
<u>7.1</u>	<u>The history of corporate governance</u>	Fi
<u>7.2</u>	<u>The four key players in corporate governance</u>	Fi
<u>7.3</u>	<u>The current main topics of discussion</u>	Fi
7.3.1	Management remuneration	
7.3.2	Shareholder equality in terms of information	
7.3.3	Corporate governance: market sanctions	

## 5. Equity Valuation and Analysis

### Broad Learning Objectives

The features of equity shares and markets should be well understood. The valuation techniques that are employed in equity markets receive a strong emphasis with coverage of dividend discount models, the free cash flow model, ratio based valuation models and other model types, such as economic value added; a strong and in depth knowledge of these techniques should be developed. The topic syllabus concludes with a consideration of equity market equilibrium and its practical applications.

#### 1 **Equity Market and Structure**

<u>1.1</u>	<u>Equity markets</u>	Fo/Fi
1.1.1	Stock indices	
1.1.2	Uses of stock indices	
1.1.3	Number of stocks in an index	
1.1.4	Index calculation method	

<u>1.2</u>	<u>Listing on a stock exchange</u>	Fo/Fi
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<u>1.3</u>	<u>Rights of shareholders</u>	Fo/Fi
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<u>1.4</u>	<u>Reporting requirements</u>	Fo/Fi
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#### 2 **Valuation Methods**

<u>2.1</u>	<u>History</u>	Fo/Fi
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<u>2.2</u>	<u>Main valuation methods</u>	Fo/Fi
2.2.1	Substantive or asset values	
2.2.2	Relative evaluations: comparing ratios (earnings per share, price/book ratio, price/cash flow ratio, price/sales ratio, enterprise value ratios)	
2.2.3	Specific case of start-up and cyclical companies	
2.2.4	Returns or cash flow discounting	

<u>2.3</u>	<u>DCF in practical detail</u>	Fo/Fi
2.3.1	Long-term growth	
2.3.2	Cost of capital	
2.3.3	Structure of liabilities	

<b>3</b>	<b>Equity Market Equilibrium</b>	
3.1	<u>Fair value</u>	Fi
3.2	<u>Long-term equilibrium</u>	Fi
3.3	<u>Short-term equilibrium</u>	Fi
	3.3.1 Justification for the short term	
	3.3.2 The rise of short-termism	
<b>4</b>	<b>Practical Application: Equity Market Equilibrium</b>	
4.1	<u>Short-term processing of information</u>	Fi
4.2	<u>Short-term valuation methods</u>	Fi
4.3	<u>Calculating market equilibrium in the short term</u>	Fi

## 6. Economics

### Broad Learning Objectives

The major concepts and variables that underpin macroeconomic analyses should be known and understood. The IS-LM model features in the syllabus and should be well understood due to its linking of the real and financial markets. Important macroeconomic phenomena such as economic output, inflation, growth, labour markets, monetary policy and business cycles should be all assessable in some detail, together with their various interrelationships. Knowledge of international macroeconomic material should be developed via the coverage of foreign exchange rates, interest rates and prices etc. and applications of this material to practical settings achievable. To facilitate a broad economic perspective and understanding, a number of the important macroeconomic issues are assessed within a simple economic modelling framework.

#### 1 **Concepts, Major Macroeconomic Variables and the IS-LM Model**

<u>1.1</u>	<u>Major macroeconomic concepts and variables</u>	Fo/Fi
1.1.1	National income accounting: GDP and GNP	
1.1.2	Inflation	
1.1.3	Interest rates	
<u>1.2</u>	<u>The basic model of the real market in a closed economy</u>	Fo/Fi
1.2.1	The determination of demand	
1.2.2	Equilibrium in the real market: the IS relation	
<u>1.3</u>	<u>The basic model of the financial market in a closed economy</u>	Fo/Fi
1.3.1	The demand for money	
1.3.2	Equilibrium in the money market: the LM relation	
<u>1.4</u>	<u>The IS-LM model</u>	Fo/Fi
1.4.1	Equilibrium in the real and financial markets	
1.4.2	The effects of fiscal policy in a closed economy	
1.4.3	The effects of monetary policy in a closed economy	
1.4.4	Expected inflation and the IS-LM model	

#### 2 **Economic Output and the Labour Market**

<u>2.1</u>	<u>Production</u>	Fo/Fi
<u>2.2</u>	<u>The labour market</u>	Fo/Fi
<u>2.3</u>	<u>General equilibrium in the real, financial and labour markets</u>	Fo/Fi
2.3.1	Aggregate supply	
2.3.2	Aggregate demand	
2.3.3	Equilibrium output in the short and the medium run	
2.3.4	The dynamic effects of fiscal policy	
2.3.5	The dynamic effects of monetary policy	

<u>2.4</u>	<u>Monitoring the economy in the real world</u>	Fo/Fi
2.4.1	Potential output, definition and estimation	
<b>3</b>	<b>The Link between Inflation and Unemployment, Economic Growth and Business Cycles</b>	
<u>3.1</u>	<u>Inflation versus unemployment: the great trade-off?</u>	Fo/Fi
3.1.1	Unemployment and inflation: the Phillips curve	
3.1.2	The modern version of the Phillips curve	
<u>3.2</u>	<u>Economic growth</u>	Fi
3.2.1	Growth accounting	
3.2.2	Capital accumulation and economic growth	
3.2.3	Technological progress and economic growth	
<u>3.3</u>	<u>Business cycles</u>	Fi
3.3.1	The basics	
3.3.2	The classical approach: theory of exogenous business cycles	
3.3.3	The Keynesian approach: theory of endogenous business cycles	
3.3.4	Fiscal policy, monetary policy and the business cycle	
<u>3.4</u>	<u>Monitoring the economy in the real world</u>	Fi
3.4.1	Business cycle: activity	
3.4.2	Business cycle: inflation	
<b>4</b>	<b>Balance of Payments, Exchange Rates, Prices and Interest Rates</b>	
<u>4.1</u>	<u>The balance of payments</u>	Fo/Fi
4.1.1	The accounting system	
4.1.2	Domestic savings and the current account balance	
<u>4.2</u>	<u>The exchange rate</u>	Fo/Fi
4.2.1	Nominal and real exchange rate	
4.2.2	Exchange rate regimes	
<u>4.3</u>	<u>Exchange rate, prices and interest rates</u>	Fo/Fi
4.3.1	Purchasing power parity	
4.3.2	Covered interest rate parity	
4.3.3	Uncovered interest rate parity	



<b>5</b>	<b>Economic Issues Explained with a Simple Model</b>	
<u>5.1</u>	<u>The basic model of the real and financial markets in an open economy</u>	Fi
5.1.1	The determination of demand in the real market	
5.1.2	Equilibrium in the real market: the IS relation in the open economy	
5.1.3	Equilibrium in the financial market: the LM relation in the open economy	
5.1.4	Equilibrium in an open economy: the Mundell-Fleming model	
5.1.5	The effects of policy in an open economy	
5.1.6	Aggregate supply and demand in the open economy	
<u>5.2</u>	<u>Theories of exchange rate determination</u>	Fi
5.2.1	Balance of payments approach	
5.2.2	The asset approach	
5.2.3	Exchange rate determination: empirical evidence	
<u>5.3</u>	<u>Statistical behaviour of the exchange rate</u>	Fi
<b>6</b>	<b>Monetary Policy</b>	
<u>6.1</u>	<u>Basic concepts of monetary theory</u>	Fi
6.1.1	The definition of money	
6.1.2	Money supply and the money multiplier	
<u>6.2</u>	<u>Monetary policy</u>	Fi
6.2.1	The implementation process of monetary policy	
6.2.2	The instruments of monetary policy	
<u>6.3</u>	<u>The transmission mechanism of monetary policy on the real economy</u>	Fi
6.3.1	Interest rate channel	
6.3.2	Credit channel	
6.3.3	Exchange rate channel	
<u>6.4</u>	<u>Central bank operations in major countries</u>	Fi

# **7. Fixed Income Valuation and Analysis**

## **Broad Learning Objectives**

The characteristics and features of fixed income securities, both plain vanilla and more complex, together with the associated interest rate and risk related measures that are used in fixed income markets should be known and how they are applied in practical settings understood. The important topics of credit risk and asset backed securities are covered in some detail within the module with the objective of providing a strong understanding of these phenomena. The various strategies that are available to the fixed income portfolio manager should also be understood and their application in practical settings known.

### **1 General Principles**

#### 1.1 The debt instrument concept Fo/Fi

- 1.1.1 Economic role of bond issues
- 1.1.2 Bond issuers
- 1.1.3 Bond characteristics
- 1.1.4 Preferred stocks

#### 1.2 Time value of money Fo/Fi

- 1.2.1 Simple versus compound interest
- 1.2.2 Present and future value
- 1.2.3 Annuities
- 1.2.4 Continuous discounting and compounding
- 1.2.5 Bond valuation
- 1.2.6 Price/yield relationship

#### 1.3 Bond yield measures Fo/Fi

- 1.3.1 Current yield
- 1.3.2 Yield to maturity
- 1.3.3 Yield to call
- 1.3.4 Other yields
- 1.3.5 Other basic concepts
- 1.3.6 Yield curves
- 1.3.7 Yield spread analysis

### **2 Interest Rates – Term Structures and Applications**

#### 2.1 Term structure of interest rates Fo/Fi

- 2.1.1 Yield curves and shapes
- 2.1.2 Theories of term structures

<u>2.2</u>	<u>Risk measurement</u>	Fo/Fi
	2.2.1 Risk measurement tools	
	2.2.2 Duration and modified duration	
	2.2.3 Convexity	
	2.2.4 Duration and convexity between coupon payment dates	
	2.2.5 Impact of coupon payments and time lapse on duration	
	2.2.6 Key rate duration	
	2.2.7 Portfolio duration, convexity and key rate duration	
<u>2.3</u>	<u>Usage</u>	Fo/Fi
	2.3.1 Bond yield curves	
	2.3.2 Bond curves in market usage	
	2.3.3 Curve shapes and forward rates	
	2.3.4 Curves, economic activity and monetary policy	
	2.3.5 Portfolio valuation and mark-to-market with unobserved prices	
	2.3.6 Financial engineering	
	2.3.7 Risk management	
<b>3</b>	<b>Hybrid Forms</b>	
<u>3.1</u>	<u>Bonds with warrants</u>	Fo/Fi
	3.1.1 Investment characteristics	
	3.1.2 Valuation of warrants	
	3.1.3 Empirical studies and market	
	3.1.4 Exotic types of warrants	
<u>3.2</u>	<u>Convertible bonds</u>	Fo/Fi
	3.2.1 Investment characteristics	
	3.2.2 Convertible bond features	
	3.2.3 Valuation of convertible bonds	
	3.2.4 Investment strategies	
	3.2.5 Risk management of convertible bonds	
	3.2.6 Empirical studies	
	3.2.7 Contingent convertibles	
<u>3.3</u>	<u>Callable bonds</u>	Fo/Fi
	3.3.1 Investment characteristics	
	3.3.2 Valuation and duration	
<u>3.4</u>	<u>Floating rate notes</u>	Fo/Fi
	3.4.1 Investment characteristics and types	
	3.4.2 Yield measures for floating rate notes	
	3.4.3 Risk measures – interest rate versus credit duration	
	3.4.4 Complex FRN's	
<u>3.5</u>	<u>Inflation-linked bonds</u>	Fo/Fi
	3.5.1 Real and break-even rates	
	3.5.2 Investment characteristics	
	3.5.3 Market situation	

<b>4</b>	<b>Credit Risk and Mortgage Securitisation</b>	
<u>4.1</u>	<u>Credit risk</u>	Fi
	4.1.1 Relevance of the corporate bond market	
	4.1.2 Fundamental credit analysis	
	4.1.3 Credit rating and rating agencies	
	4.1.4 Curves and credit	
<u>4.2</u>	<u>Mortgage-backed securities</u>	Fi
	4.2.1 Mortgage-backed bond market	
	4.2.2 Types of mortgages	
	4.2.3 Mortgage securitisation	
<b>5</b>	<b>Asset-Backed Securities</b>	
<u>5.1</u>	<u>Structures</u>	Fi
<u>5.2</u>	<u>Types of underlying assets</u>	Fi
	5.2.1 Instalment contracts	
	5.2.2 Revolving lines of credit	
<u>5.3</u>	<u>Credit enhancement</u>	Fi
	5.3.1 Excess spread	
	5.3.2 Subordination	
	5.3.3 Guaranty	
	5.3.4 Reserve fund	
	5.3.5 Recourse	
	5.3.6 Over-collateralisation	
<u>5.4</u>	<u>Major risks of ABS</u>	Fi
	5.4.1 Interest rate risks	
	5.4.2 Prepayment risks	
	5.4.3 Credit risk	
	5.4.4 Liquidity risk	
	5.4.5 Counterparty risks	
<u>5.5</u>	<u>Valuation methodologies</u>	Fi
<b>6</b>	<b>Fixed Income Portfolio Management Strategies</b>	
<u>6.1</u>	<u>Passive management</u>	Fo/Fi
	6.1.1 Buy and hold	
	6.1.2 Indexation	
	6.1.3 Interest rate immunisation	
	6.1.4 Asset-liability management	
<u>6.2</u>	<u>Active management</u>	Fo/Fi
	6.2.1 Forecasting and portfolio construction	
	6.2.2 Active management in practice	

<u>6.3</u>	<u>Portfolio construction based on a factor model</u>	Fi
6.3.1	Model specification	
6.3.2	Interest rate anticipation strategies	
<u>6.4</u>	<u>Computing the hedge ratio: the modified duration method</u>	Fi
6.4.1	Hedging strategies using longer bond futures	

## 8. Derivative Valuation and Analysis

### Broad Learning Objectives

The basic characteristics and types of futures and options (including exotic options) should be understood, together with various important features associated with these instruments, such as valuation and pricing, risk management and other investment strategies. The option sensitivities (the “Greeks”) such as delta, gamma etc., together with volatility related issues should also be fully understood and capable of being applied to various investment problems. Swaps and credit derivatives should be similarly understood, with the material on credit derivatives reflecting their growing importance and impacts in recent times.

#### 1 Futures

<u>1.1</u>	<u>Basic characteristics of forward and futures contracts</u>	Fo/Fi
<u>1.2</u>	<u>Mechanics of trading in futures markets</u>	Fo/Fi
1.2.1	Long and short positions	
1.2.2	Profit and loss at expiration	
1.2.3	Closing positions	
1.2.4	Delivery procedures	
1.2.5	The marking to market of futures contracts	
1.2.6	The leverage effect	
1.2.7	Futures quotes	
1.2.8	World major futures markets	
<u>1.3</u>	<u>Futures valuation and analysis</u>	Fo/Fi
1.3.1	The basis	
1.3.2	Theoretical price of futures	
<u>1.4</u>	<u>Examples of various futures contracts</u>	Fo/Fi
1.4.1	Stock futures	
1.4.2	Foreign exchange futures	
1.4.3	Commodity futures	
1.4.4	Interest rate futures	
1.4.5	Other futures contracts	
1.4.6	Further considerations	
<u>1.5</u>	<u>Introduction to hedging strategies using futures</u>	Fo/Fi
1.5.1	The hedge ratio	
1.5.2	The perfect hedge	
1.5.3	Basis risk and correlation risk	
1.5.4	The minimum variance hedge ratio	
1.5.5	Hedging with several futures contracts	
1.5.6	Examples of hedging	
1.5.7	Simple answers to questions about hedging with futures	

<b>2</b>	<b>Options</b>	
<u>2.1</u>	<u>Introduction</u>	Fo/Fi
<u>2.2</u>	<u>Definitions and basic characteristics of options</u>	Fo/Fi
	2.2.1 Option main characteristics	
	2.2.2 Call and put options	
	2.2.3 Call and put options vs. forward and futures contracts	
	2.2.4 The example of equity options	
<u>2.3</u>	<u>Basic option strategies</u>	Fi
	2.3.1 Spreads	
	2.3.2 Strangles and straddles	
<u>2.4</u>	<u>Arbitrage relationships</u>	Fo/Fi
	2.4.1 Introduction: principle of no-arbitrage	
	2.4.2 Value of an option at expiration	
	2.4.3 General arbitrage relationships	
	2.4.4 A fundamental relationship: the put-call parity	
<u>2.5</u>	<u>B&amp;S option pricing model</u>	Fo/Fi
	2.5.1 Risk-neutral pricing	
	2.5.2 European options on stocks paying no dividends	
	2.5.3 European options on stocks paying constant known dividends	
	2.5.4 American options	
	2.5.5 Limitations of the Black-Scholes model	
<u>2.6</u>	<u>Sensitivity analysis of options premiums</u>	Fo/Fi
	2.6.1 Delta	
	2.6.2 Gamma	
	2.6.3 Lambda/Omega	
	2.6.4 Theta	
	2.6.5 Rho	
	2.6.6 Vega	
<u>2.7</u>	<u>Volatility and related topics</u>	Fi
	2.7.1 Estimating volatility from historical data	
	2.7.2 Implied volatility and volatility smile	
	2.7.3 The volatility index (VIX)	
<u>2.8</u>	<u>Options on other underlying assets</u>	Fo/Fi
	2.8.1 Equity index options	
	2.8.2 Options on Futures	
	2.8.3 Warrants	
	2.8.4 Foreign exchange options	
	2.8.5 Caps, floors, collars	
<u>2.9</u>	<u>Exotic options</u>	Fi
	2.9.1 Path-independent options	
	2.9.2 Path-dependent options	
	2.9.3 Pricing exotic options with numerical methods	

<u>2.10</u>	<u>Appendix: binominal option pricing model</u>	Fo/Fi
2.10.1	One-period binominal model	
2.10.2	Multi-period binominal model	
2.10.3	American puts and calls	
2.10.4	Limiting results of the binominal model	
<b>3</b>	<b>Swaps and Credit derivatives</b>	
<u>3.1</u>	<u>Introduction</u>	Fi
<u>3.2</u>	<u>Swaps</u>	Fi
3.2.1	Definition and characteristics	
3.2.2	Strategies using swaps	
3.2.3	Pricing and valuing swaps	
3.2.4	Other types of swaps	
<u>3.3</u>	<u>Credit Derivatives</u>	Fi
3.3.1	The mechanisms of Credit Derivatives market	
3.3.2	Market participants	
3.3.3	Institutional framework	
3.3.4	Credit default swaps (CDS)	
3.3.5	Credit linked notes (CLN)	
3.3.6	Other credit default swap products	
3.3.7	Spread volatility of credit default swaps	
3.3.8	Credit derivatives: valuation of credit default swaps	
3.3.9	The role of credit derivatives	
3.3.10	The aftermath of the 2008 financial crisis	



## 9. Portfolio Management

### Broad Learning Objectives

An understanding of the important building blocks associated with portfolio management, such as the risk/return relationship, diversification, pricing models, market efficiency and risk measures should be obtained. The various features of investment strategies (including international assets) and hedging strategies (including dynamic and insurance strategies) and Asset-Liability Management should be understood together with their applications. An understanding of the importance and features of performance measurement and evaluation, together with the choice of investment manager, should be developed, together with a knowledge of the features and benefits associated with the alternative investment asset class.

#### 1 Modern Portfolio Theory I

- |            |   |       |
|------------|---|-------|
| <u>1.1</u> | <u>The risk / return framework</u>                          | Fo/Fi |
| 1.1.1      | Return and measures of return                               |       |
| 1.1.2      | Risk  |       |
| <u>1.2</u> | <u>Portfolio theory</u>                                     | Fo/Fi |
| 1.2.1      | Diversification and portfolio risk                          |       |
| 1.2.2      | Markowitz model and efficient frontier                      |       |
| <u>1.3</u> | <u>Capital Asset Pricing Model (CAPM)</u>                   | Fo/Fi |
| 1.3.1      | Major assumptions   |       |
| 1.3.2      | Capital market line (CML)                                   |       |
| 1.3.3      | Security market line (SML)                                  |       |
| 1.3.4      | The zero-beta CAPM  |       |
| <u>1.4</u> | <u>Index and market models</u>                              | Fo/Fi |
| 1.4.1      | The single-index model and its hypothesis                   |       |
| 1.4.2      | Decomposing variance into systematic and diversifiable risk |       |
| 1.4.3      | The link with the CAPM                                      |       |
| 1.4.4      | Applications of the market model                            |       |
| 1.4.5      | Multi-index models  |       |

#### 2 Modern Portfolio Theory II and Behavioural Finance

- |            |   |    |
|------------|---|----|
| <u>2.1</u> | <u>Efficient Markets</u>                | Fi |
| 2.1.1      | Information efficient markets           |    |
| 2.1.2      | Efficient market hypothesis             |    |
| 2.1.3      | Are markets efficient?                  |    |
| 2.1.4      | Market efficiency and investment policy |    |
| 2.1.5      | Lessons from market efficiency          |    |

<u>2.2</u>	<u>Arbitrage Pricing Theory (APT)</u>	Fi
2.2.1	Assumptions underlying the APT	
2.2.2	The APT and its derivation	
2.2.3	The link between the APT and the CAPM	
2.2.4	Empirical tests of the APT	
2.2.5	Pre-specifying factors	
2.2.6	Applications of the APT	
<u>2.3</u>	<u>Behavioural Finance</u>	Fi
2.3.1	Prospect Theory as a Foundation for Behavioural Finance	
2.3.2	Level 0: Traditional Finance	
2.3.3	Level 1: Behavioural Biases	
2.3.4	Level 2: Market Anomalies	
2.3.5	Level 3: Style Investing	
<b>3</b>	<b>Investment Strategies</b>	
<u>3.1</u>	<u>Investment policy</u>	Fo/Fi
3.1.1	Individual investors	
3.1.2	Institutional investors	
<u>3.2</u>	<u>Asset allocation</u>	Fo/Fi
3.2.1	Asset allocation overview	
3.2.2	Types of asset allocations	
<u>3.3</u>	<u>Exchange-Traded Funds</u>	Fo/Fi
3.3.1	Internal Workings of ETFs	
3.3.2	Index Replication Methods	
3.3.3	ETF Trading and Costs	
3.3.4	ETF Applications and Techniques	
<u>3.4</u>	<u>Macroeconomics and Asset Prices</u>	Fo/Fi
3.4.1	Introduction	
3.4.2	Macroeconomic Prices and Quantities	
3.4.3	Asset Prices and Economic Policies	
3.4.4	Financial Globalisation and Financial Crises	
<b>4</b>	<b>Hedging Strategies</b>	
<u>4.1</u>	<u>Combining options and traditional assets</u>	Fo/Fi
4.1.1	Covered call strategy	
4.1.2	Enhanced indexing	
4.1.3	130/30 funds	
4.1.4	Using interest rates OTC products	
<u>4.2</u>	<u>Portfolio insurance</u>	Fo/Fi
4.2.1	Stop-loss approach	
4.2.2	Static portfolio insurance	
4.2.3	Dynamic portfolio insurance	
4.2.4	Constant proportion portfolio insurance	
<u>4.3</u>	<u>Hedging with stock index futures</u>	Fo/Fi

4.3.1	Long hedge	
4.3.2	Short hedge	
4.3.3	A complete hedging analysis	
4.3.4	Adjusting the beta of a stock portfolio	
<u>4.4</u>	<u>Hedging with foreign exchange futures</u>	Fo/Fi
4.4.1	Hedging against a rise of the foreign currency	
4.4.2	Hedging against a drop of the foreign currency	
4.4.3	Hedging with cross-currency rates	
<u>4.5</u>	<u>Hedging with interest rate futures</u>	Fo/Fi
4.5.1	Hedging using short term interest rate futures	
4.5.2	Hedging using long term interest rate futures	
4.5.3	Hedging against decreasing rates (long hedge)	
4.5.4	Hedging against increasing rates (short hedge)	
4.5.5	Moving to a preferred duration	
<u>4.6</u>	<u>Use of swaps in portfolio management</u>	Fo/Fi
<u>4.7</u>	<u>Asset allocation with futures</u>	Fo/Fi
<b>5</b>	<b>Asset / Liability Management</b>	
<u>5.1</u>	<u>Introduction to ALM</u>	Fo/Fi
5.1.1	Background of ALM	
5.1.2	ALM with pension funds	
5.1.3	Types of ALM models	
<u>5.2</u>	<u>Modelling liabilities</u>	Fo/Fi
5.2.1	Types of liabilities	
5.2.2	Valuation of pension liabilities	
5.2.3	Annuity factors and discount rates	
<u>5.3</u>	<u>Modelling assets</u>	Fo/Fi
5.3.1	Types of asset classes	
5.3.2	Risk and return characteristics	
<u>5.4</u>	<u>Surplus and funding ratios</u>	Fo/Fi
<u>5.5</u>	<u>Integrated optimisation</u>	Fo/Fi
5.5.1	Target functions and trade-offs	
5.5.2	Surplus risk management	
5.5.3	Pension fund management	
<u>5.6</u>	<u>Implementation of strategies</u>	Fo/Fi
5.6.1	Stochastic simulations	
5.6.2	Active versus passive ALM strategies	
5.6.3	Dynamic adjustment of assets and liabilities	

<b>6</b>	<b>International Investments</b>	
<u>6.1</u>	<u>International diversification</u>	Fo/Fi
6.1.1	Computing foreign currency return and variance	
6.1.2	Cross-correlation	
6.1.3	Country risk	
6.1.4	Emerging markets	
<u>6.2</u>	<u>Hedging foreign exchange risk</u>	Fo/Fi
6.2.1	Effective management of currency risk	
6.2.2	Behaviour of currency returns	
6.2.3	Is it a separate asset class / zero sum game?	
6.2.4	Treatment of currency within a global portfolio / optimal level of hedge	
6.2.5	Black's paper on universal currency hedge	
6.2.6	Use of overlay strategies	
<u>6.3</u>	<u>International equities</u>	Fo/Fi
<u>6.4</u>	<u>International fixed income</u>	Fo/Fi
<u>6.5</u>	<u>Managing a portfolio of international assets</u>	Fo/Fi
<b>7</b>	<b>Value at Risk (VaR)</b>	
<u>7.1</u>	<u>Definition</u>	Fo/Fi
7.1.1	Confidence level	
7.1.2	Target horizon	
7.1.3	Main assumptions of value at risk	
<u>7.2</u>	<u>Interpretation of value at risk</u>	Fo/Fi
<u>7.3</u>	<u>Calculation of value at risk</u>	Fo/Fi
7.3.1	VaR of normally distributed asset returns	
7.3.2	Local-valuation approaches	
7.3.3	Full-valuation approaches	
7.3.4	Comparison of local versus full-valuation approaches	
<u>7.5</u>	<u>Dangers and pitfalls</u>	Fo/Fi
<b>8</b>	<b>Sustainable Investment</b>	
<u>8.1</u>	<u>Motivation and objectives</u>	Fo/Fi
<u>8.2</u>	<u>Fundamentals</u>	Fo/Fi
8.2.1	Understanding sustainability	
8.2.2	Sustainability in an investment context	

<u>8.3</u>	<u>Sustainable investment strategies</u>	Fo/Fi
8.3.1	Historical development	
8.3.2	Market drivers	
8.3.3	Sustainable investment strategies: an overview	
<u>8.4</u>	<u>Integrating ESG into the investment process</u>	Fo/Fi
8.4.1	ESG data and principles in an investment process	
8.4.2	Performance observations	
8.4.3	Mainstreaming and the case for integrated valuation	
<b>9</b>	<b>Performance Measurement and Evaluation</b>	
<u>9.1</u>	<u>Performance measurement</u>	Fo/Fi
9.1.1	Return measurement	
9.1.2	Benchmarks	
9.1.3	Risk measurement	
<u>9.2</u>	<u>Performance attribution</u>	Fi
9.2.1	Return attribution	
9.2.2	Risk attribution	
<u>9.3</u>	<u>Performance presentation</u>	Fi
9.3.1	Types of performance presentation	
9.3.2	Best practice for performance presentation	
<u>9.4</u>	<u>Investment controlling</u>	Fi
9.4.1	Definition and outline of investment controlling	
9.4.2	Generic performance evaluation process	
9.4.3	Pitfalls in performance evaluation	
<b>10</b>	<b>Choice of the Investment Manager</b>	
<u>10.1</u>	<u>Choice of the investment manager</u>	Fi
10.1.1	Assessing and choosing managers	
10.1.2	Style analysis	
10.1.3	Means of style analysis	
10.1.4	Style analysis: application to different asset classes	
10.1.5	Risks, controls and prudential issues: organisational issues	
10.1.6	Risks, controls and prudential issues: fee structures	
<b>11</b>	<b>Equities Management</b>	
<u>11.1</u>	<u>Principles of equity management</u>	Fi
11.1.1	Risk in operational terms	
11.1.2	Risk control	
11.1.3	Active and passive management	
<u>11.2</u>	<u>Managing an equity portfolio</u>	Fi
11.2.1	Active management	
11.2.2	Passive management	

<u>11.3</u>	<u>Trading and Financial Markets</u>	Fi
11.3.1	The role of trading	
11.3.2	Limit Order Book Markets	
11.3.3	The costs of trading	
11.3.4	Institutional Order Execution	
11.3.5	Fragmentation	
11.3.6	Detecting and Hiding Trading Intentions	
11.3.7	Dark Pools	
11.3.8	Market Makers – Old and New	
11.3.9	Manipulative Conduct	
11.3.10	Market Solutions to Manipulation	
<b>12</b>	<b>Alternative Investments</b>	
<u>12.1</u>	<u>Managing a property portfolio</u>	Fi
12.1.1	Real estate indices	
12.1.2	Return and risk of real estate	
12.1.3	Correlation between the returns on various asset classes	
12.1.4	Determining the share of real estate in optimal portfolios	
<u>12.2</u>	<u>Alternative assets / private capital</u>	Fi
12.2.1	Unlisted non-property securities and private capital	
12.2.2	Hedge funds	
<u>12.3</u>	<u>Investing in Commodities</u>	Fi
12.3.1	Commodity Sectors	
12.3.2	Commodities as an Asset Class	
12.3.3	Theories of Future Returns	
12.3.4	Commodity Indices	
12.3.5	Investment Vehicles	