

PFM

PROFESSIONAL FINANCIAL MODELER

PFM BODY OF KNOWLEDGE

A close-up photograph of a person's hand using a pen to draw a red line graph on a financial document. The document contains various tables and text, including a blue header that reads "Japan's Economic Miracle From 1950 Into the Last Decade of". The background is a light blue gradient with a diagonal white line.

Guideline to PFM Program Curriculum

International Financial Modeling Institute

Copyrights © 2017 by International Financial Modeling Institute

Last Update: September 2017

PFM BODY OF KNOWLEDGE

About PFM BOK

Professional Financial Modeler (PFM) Certification Program has embodied strong curriculum through the course of its development and currently evolves as a program with rapid curriculum development. The aim for developing global curriculum is clear. To provide financial model professionals with state of the art knowledge in order to make models which are more accurate and more connected to capital market and reflect the true value of a company.

PFM Body of Knowledge (PFM BOK) is developed to create a common consensus of what a modeler should know in order to create and prepare a sound model. The BOK is the learning objective when taking PFM Program.

PFM BOK is developed on global basis, meaning there is a unified curriculum applicable for every country where PFM program is administered. During offline class delivery, deviation to the curriculum is allowed locally to keep the program in line with the local accounting standard, taxation, regulation, business practice or specific techniques used in the country or region. However, those deviations and techniques are exempted from PFM Examination.

PFM BOK is then translated into PFM Program Module which contains the hard knowledge based on the BOK. To explain the complexity of concepts delivered in PFM Program Module, many concepts are then translated into spreadsheet based models.

The BOK is divided into seven main Sections, outlined below:

1. Accounts and Reports Used for Financial Model

Study about the common format of generic financial statement format (income statement, balance sheet, cash flow statement) used for building a financial model. Learn about the use, purpose and basic calculation of each account. There is discussion on how to make a balanced projection. The deviation with accounting standard is discussed.

2. Forecasting Techniques and Assumptions

Learn about important forecasting techniques by using regression and time series for linear and non-linear forecast. Participants will also learn how to create Monte Carlo prediction by using Excel by using several distributions based on linear and non-linear drift. Discussion on how to apply Monte Carlo simulation in preparing important assumptions.

3. Financial Projection

Study various projection assumptions commonly used in preparing financial projections, both macroeconomic and firm specific projections. Some specific topics are discussed such as modeling FX rate and inflation. Learn to derive interest rate from bond yields by using bootstrapping technique. Learn to prepare assumptions in order to derive sustainable model by studying about how to model continuous fixed asset investments, continuous long term loan balance, preparing depreciation and amortization table, loan model, model intangibles, goodwill, and how to account investment in subsidiaries by using various methods. Discuss about how to prepare a projection step by step.

4. Valuation Methodologies

Learn about single rate and multiple rate Present Value and develop Required Rate of Return by using single interest rate and multiple interest rates. Learn to calculate firm and equity value by using various discounted models, namely Discounted Cash Flow (DCF) model, Enterprise Value based DCF models, Dividend Discount Model and Residual Income Models. Participants will also learn to value a company by using price multiples, on both M&A and capital market multiples.

5. Project Financial Model and Feasibility Analysis

Learn about financial model for a specific project, the important when preparing the model. Differ between financial projection for a corporate and for a specific project. Feasibility analysis of a project by using methods such as NPV, IRR, Discounted Payback, Profitability Index. Learn to use Term Structure NPV and understand the flaws of NPV.

6. Financial Model Sustainability and Risk Analysis

Learn about sustainable modeling to understand various highly common flaws done by analysts which causes valuation to be inflated. There will be analysis by using common size and index analysis. There will also be discussion on sensitivity risk analysis techniques by using sensitivity ratios such as various duration techniques. There is discussion on determining the most influential (risky) assumptions. Methods to conduct scenario analysis will also be discussed.

Learn to prepare financial ratio analysis including leverage. There is discussion on Delta Ratios

7. Credit Analysis Based on Financial Model

This topic describes the process to determine whether a company or project is credit worthy through the application of credit analysis on a model.

Provisions on PFM BOK

Each of the Sections is divided into Chapters, where each Chapter explains a specific discussion within the Section. To ensure the comprehensive standardization of all study materials, topics in each Chapter is further divided into specific instruction outlines called Detailed Outline Subtopic (DOS).

There are currently 188 DOSes applicable for PFM program. In 2015 there are only 129 DOSes applied in PFM BOK. The increase is the result of curriculum expansion and the rewriting of some DOSes to make them more applicable and easier to understand.

The DOS is updated, enhanced and increased from time to time to ensure the thoroughness of PFM Curriculum and its applicability with financial modeling profession. The number of DOS as well as topics will increase further after the online learning facility is available for exam takers.

Each DOS has different probability of appearing in PFM Multiple Choice examination. Some DOSes will certainly appear on examination, they are dubbed as 'core' DOS. While other DOS may be less likely to appear on examination. The probability of a DOS appearing on

examination may change from time to time and determines how examination problems, especially for multiple choice examination problems, to appear in examination.

For computer practice examination, many DOSes are already ingrained in the model. It is assumed that examination candidate already knows how to apply a particular DOS in models. Please note that not every DOS appears in Computer Practice Examination.

Licensed Training Providers may add new topics which are not included in PFM curriculum or prepare syllabus which does not cover topics in sequence. However, providers must deliver all topics included in PFM BOK and accordingly, PFM Module.

Furthermore, due to time limitation of time available for conducting On Site (off line) PFM Preparation Class, training providers may opt not to deliver all materials in the classroom, but instead divert some simple topics as online study or off class reading assignments.

As PFM is developing its content gradually, there could be additional topics inserted or removed from time to time. As the curriculum is expanding due to current development process, BOK is also bound for change. Hence, there will also be changes on this guideline. Exam Takers should check to obtain the latest version whenever available.

For Candidates who wants to retake PFM Examination after failing in previous attempts, careful approach should be taken that PFM Curriculum may change from time to time. Hence, it is crucial that the Candidate requests for any possible updates from Licensed Training Provider or by downloading the latest version of this BOK.

Currently, discussion on financial model for specific sectors and sub sectors is relatively limited to some comparisons and participants is resorted to master class programs (programs conducted by local training provider and not included as part of PFM Curriculum).

Instruction Words Used in DOS

Examination participants should take careful note on the wording of each DOS, as the wording provides guidance on how exam problem is structured and presented during examination, in particular, for Multiple Choice Examination.

Below are the instruction words commonly used in PFM DOS. Please note that the definition of each instruction is specifically applied in interpreting PFM DOS and may not be suitable for other purposes.

Calculate	To find value through the application some mathematical formula
Classify	To assign into categories or group based on a certain parameter
Connect	To bring together so that a real or notional link is established
Construct	To build by putting together constituent components. DOS containing this wording will mainly appear as the component for Computer Practice Examination problem
Define	To mention the exact meaning of a terminology or concept
Describe	To portray in words
Determine	To ascertain between choices
Differ	To compare the meaning between somewhat similar concepts
Discuss	To apply critical thinking and develop argument on a concept
Estimate	To determine the approximate value by using less certain calculation methods
Explain	To make clear the meaning of a concept in more detail
Forecast	To make estimation on the value of something, mainly a single variable
Judge	To develop an opinion based on careful analysis of factors
Prepare	To put into written format based on specific instruction. DOS containing this wording will mainly appear as the component for Computer Practice Examination problem
Understand	To infer comprehension from provided explanation

PFM BOK DETAILED OUTLINE STATEMENT (DOS)

Section I

Accounts and Reports Used in Financial Model Development

1.1.	Understand the difference between financial report and financial model
1.2.	Understand why the structure of financial model reports is sometimes different from International Financial Reporting Standard (IFRS)
1.3.	Understand the format of Balance Sheet and Income Statement for Financial Model
1.4.	Discuss the format of financial report
1.5.	Understand the breakdown of revenue
1.6.	Understand Cost of Goods Sold and why some companies do not have Cost of Goods Sold
1.7.	Understand operating costs
1.8.	Understand other income or expenses
1.9.	Understand about comprehensive income
1.10.	Understand the items in balance sheet
1.11.	Understand the different structure of balance sheet across different industries
1.12.	Understand items regarded as Current asset
1.13.	Understand Fixed asset including Capitalized Interest, Construction in Progress
1.14.	Understand items in Current liabilities
1.15.	Calculate Current Maturity of Long Term Liabilities
1.16.	Understand various items in Long Term Liabilities
1.17.	Understand various items in Equities
1.18.	Calculate Retained Earnings and Other Comprehensive Income
1.19.	Differ Cash versus Accrual Accounting
1.20.	Classify transactions into Cash Flow Operating, Cash Flow Investing and Cash Flow Financing
1.21.	Describe Direct versus Indirect Cash Flow Statement
1.22.	Prepare Indirect Cash Flow Projection, connect with balance sheet and balance the projection
1.23.	Understand the concept of working capital and Calculate Working Capital
1.24.	Explain Mechanics of direct and indirect cash flow statement
1.25.	Explain the strength and weaknesses of direct and indirect cash flow statement
1.26.	Understand the relationship between cash flow statement, balance sheet and income statement
1.27.	Prepare cash flow statement for financial modeling purpose based on direct and indirect method
1.28.	Estimate the level of health of a company by looking at its cash flow

Section II

Forecasting Techniques and Assumptions

2.1.	Calculate average growth and Compounded Annual Growth Rate (CAGR) and understand the weaknesses of both methods
2.2.	Understand the impact of using popular growth models to global valuation
2.3.	Understand Quantitative Forecasting methodologies
2.4.	Understand Anchoring Technique and Moving Average Technique
2.5.	Prepare the forecast by using non linear models
2.6.	Prepare best case, base case and worst case scenario through forecasting
2.7.	Prepare cyclical forecast using Autoregressive Method
2.8.	Understand Linear and Multiple Regression
2.9.	Estimate the predictive ability of a forecast model and understand how to improve the accuracy of a model
2.10.	Understand and develop Monte Carlo Model
2.11.	Differ between Normal and Lognormal Monte Carlo
2.12.	Calculate probability by using Monte Carlo
2.13.	Understand and develop Monte Carlo Simulation with various non-linear drifts including custom drift for projects
2.14.	Understand and Calculate Value at Risk for financial model
2.15.	Understand How to Model Monte Carlo Value At Risk (VAR)
2.16.	Understand GARCH method and how to apply volatility prediction based on GARCH in Monte Carlo Simulation
2.17.	Understand Monte Carlo for modeling interest rate
2.18.	Understand the probabilistic nature of assumption
2.19.	Understand the types and nature of macroeconomic, industry and company related assumptions
2.20.	Calculate future exchange rate
2.21.	Understand yield to maturity, yield curve and spot interest rate
2.22.	Understand how to calculate bonds value by using spot interest rate
2.23.	Understand term structure model
2.24.	Understand how to model growth and inflation rates by using several techniques
2.25.	Calculate working capital turnover assumptions
2.26.	Understand and calculate various types of capital expenditure including continuous capital expenditure
2.27.	Understand Capitalized Interest
2.28.	Calculate EBITDA and understand the strength and weakness of EBITDA
2.29.	Understand the model for Comprehensive Income items
2.30.	Understand various types of intangibles including goodwill
2.31.	Understand depreciation models and how to apply in model
2.32.	Understand the model of various loan types including Continuous Loan
2.32.	Understand and calculate Loan payment by using Amortization and Discretionary Method
2.33.	Understand various types of Current Maturity of Long Term Liabilities for loans and bullet payment bonds
2.34.	Understand and Differ Cost Method, Equity Method, Proportionate Consolidation Method and Consolidation Method

Section III

Financial Projection

3.1.	The purpose of preparing financial model and the characteristics of financial models based on their purposes
3.2.	Differ between financial model for credit, investment, mergers and acquisitions and risk management purposes
3.3.	Explain the role of standard error in determining the level of error of a projection
3.4.	Understand how to build projection based on extensive assumptions
3.5.	Explain The format of financial model for corporation
3.6.	Explain how to construct sub folders supporting the accounts in financial model
3.7.	Calculate revenue by using multiple assumptions
3.8.	Construct and differ COGS and inventory calculation for trading and manufacturing company
3.9.	Construct operating cost folder by using multiple cists with different calculation methodologies
3.10.	Calculate foreign exchange gain or loss
3.11.	Construct and calculate other income and other comprehensive income accounts
3.12.	Prepare capital expenditure, intangibles, depreciation and amortization calculation, including continuous capital expenditure and depreciation based on various models
3.13.	Construct debt schedule and interest calculation
3.14.	Understand and calculate continuous loan
3.15.	Construct Cash Flow Statement by Using Indirect Method
3.16.	Understand and Calculate Working Capital
3.17.	Explain the technique to quickly and efficiently prepare a full set financial model
3.18.	Connect the whole projection by building all supporting folders and folders and balance the balance sheet

Section IV

Valuation Methodologies

4.1.	Understand multiple cash flow Present Value Method by using single and multiple interest rates
4.2.	Understand and differ various valuation types
4.3.	Understand the workflow of various valuation methods
4.4.	Understand and calculate Free Cash Flow Methods: FCFF and FCFE
4.5.	Understand required return and differ with projected return
4.6.	Understand and calculate Cost of Debt for company with final and non final tax
4.7.	Understand the adjustment of Cost of Debt for the issuance of premium bonds, discount bonds and zero coupon bonds
4.8.	Understand and calculate Cost of Mezzanine: Cost of Preferred Shares
4.9.	Understand and calculate Cost of Equity by using various models including Capital Asset Pricing Model
4.10.	Understand the technique to generate single risk free rate by combining multiple interest rates
4.11.	Understand Beta and calculate Beta from raw data
4.12.	Calculate Beta for Non Listed Companies
4.13.	Understand and calculate Weighted Average Cost of Capital (WACC)
4.14.	Understand market value and book value weighting for calculating WACC
4.15.	Understand and calculate Terminal Value based on Constant Growth Model
4.16.	Understand the impact of Terminal Value to determine valuation
4.17.	Understand why Terminal Value based on constant growth model may lead to serious valuation bias and understand the terminal value method based on 2 stage growth model
4.18.	Understand the relationship between firm value and equity value and determine the correct calculation methodology to derive equity value
4.19.	Calculate Firm Value and Equity Value
4.20.	Understand various types of value adjustment, explain about adjustment continuum and explain how to model companies with extreme valuation by using adjustment models
4.21.	Understand Term Structure Discounted Cash Flow
4.22.	Calculate multiple rate Cost of Debt, Cost of Preferred Shares, Cost of Equity and WACC
4.23.	Calculate equity value by using Term Structure Discounted Cash Flow
4.24.	Explain the strength and weakness of single and Term Structure Discounted Cash Flow
4.25.	Construct model based on FCFF and FCFE for single and Term Structure DCF
4.26.	Understand the connectivity between multiple asset classes
4.27.	Understand the comparison between Enterprise Value and Firm Value and Calculate the connectivity between Enterprise Value and DCF based valuations
4.28.	Calculate EV/EBITDA multiples and understand the strength and weakness of the multiple
4.29.	Understand market based valuation continuum and the bias on company valuation caused by using market based average

4.30.	Understand EV/EBITDA as terminal value in DCF valuation, its use, and understand the strengths and weaknesses of the model
4.31.	Construct EV/EBITDA based DCF model
4.32.	Understand Dividend Discount Model based on multiple cash flow
4.33.	Understand the weakness of sustainable growth rate which causes bias in model based Dividend Discount Model valuation
4.34.	Understand the adjustment for preferred shares
4.35.	Construct model based on single and Term Structure Dividend Discount Model
4.36.	Understand Residual Income and the strengths and weaknesses of the model
4.37.	Understand how to determine whether an investment creates value by using Residual Income Model
4.38.	Construct model based on single and Term Structure Residual Income
4.39.	Understand and calculate the most commonly used price multiples: Price to Earnings, Price to Book Value and Price to Sales ratios
4.40.	Understand the strength and weakness of each price multiple
4.41.	Understand and calculate price multiples based on fundamental valuation
4.42.	Construct equity valuation by using several price multiples formula
4.43.	Strength and weakness of equity value by using various techniques

Section V

Project Financial Model and Feasibility Analysis

5.1.	Explain the characteristic and type of project
5.2.	Compare corporate and project model, including multi project structure
5.3.	Understand and explain the commonly used components in project financial model
5.4.	Understand the components of project assumption
5.5.	Understand the components commonly used in determining capital expenditure of a project
5.6.	Able to construct project term and financing schedule
5.7.	Understand the difference between Cost of Goods Sold and operating expenses
5.8.	Able to construct project revenue and expense projection
5.9.	Understand how to apply depreciation based on various methods and different lifetime in a project
5.10.	Understand how to apply depreciation method on multiple assets with different life time
5.11.	Understand how to model project financing including interest during construction and interest expense
5.12.	Able to calculate project working capital needs
5.13.	Differentiate the difference between the model among different industries
5.14.	Understand the purpose and rationale of feasibility analysis
5.15.	Describe and calculate feasibility analysis techniques: Payback Period, Discounted Payback Period, Net Present Value, Profitability Index, Internal Rate of Return and Modified Internal Rate of Return including the strength and weakness of each model
5.16.	Calculate project periodic cash flow for feasibility analysis
5.17.	Calculate project beta and discount rate
5.18.	Understand the difference between cash flow and discount rate methodology used for corporate and project and the relationship between them
5.19.	Understand the application of term structure in conducting feasibility analysis
5.20.	Compare valuation with feasibility
5.21.	Understand the strength and weakness of each feasibility analysis tool
5.22.	Differ and connect NPV feasibility tool with DCF as valuation tool
5.23.	Calculate Return on Development on project based on the combination of feasibility and valuation
5.24.	Explain the main weaknesses of NPV which may impact the quality of decision making
5.25.	Explain the flaw to zero NPV as threshold and determine project feasibility
5.26.	Understand and calculate the methods for determining threshold of non feasible positive NPV
5.27.	Understand NPV profile and its role in determining project riskiness
5.28.	Understand NPV crossover and the impact in project decision making
5.29.	Understand erroneous NPV Profile due to Multiple IRR and NPV Resurfacing
5.30.	Understand Distance to Zero NPV
5.31.	Explain the detail of a full set project financial model

Section VI

Financial Model Sustainability and Risk Analysis

6.1.	Understand sustainability modeling and why preparing sustainable model can improve predictability of a model
6.2.	Understand the principle of financial modeling sustainability
6.3.	Recognize the characteristics of unsustainable models
6.4.	Understand, calculate and construct Common Size and Index analysis based on financial projection
6.5.	Judge the sustainability of a model based on Common Size and Index analysis
6.6.	Understand and differ between sensitivity analysis and scenario analysis
6.7.	Explain the usefulness of equity valuation for sensitization purpose
6.8.	Understand duration, its impact on risk analysis and the application in various asset classes
6.9.	Understand and calculate equity duration
6.10.	Understand NPV duration
6.11.	Understand and calculate Factor Sensitivity Duration to measure the impact of non interest rate risk factors
6.12.	Understand the application of Tornado Chart in depicting Factor Sensitivity Duration
6.13.	Understand Tenor Duration and its impact on measuring the sensitivity of equity value
6.14.	Understand Cross Duration and differ Cross Duration with covariance and correlation
6.15.	Understand Cross Duration Matrix and its application
6.16.	Understand Multi Factor Duration and the application in scenario analysis
6.17.	Differ Multi Factor Duration and regression technique and explain strength and weakness of each model
6.18.	Application of Best Case, Base Case and Worst Case by using basic probabilistic statistic in sensitivity analysis
6.19.	Understand financial ratio analysis for financial model and the application and determine the sustainability of a model
6.20.	Understand and calculate various ratios based on various categories: profitability, liquidity, solvency, turnover
6.21.	Understand and calculate leverage analysis
6.22.	Calculate Dupont analysis and the implication to financial models and its sustainability
6.23.	Understand and calculate Delta Ratio and its application and determine the sustainability of a model
6.24.	Construct and Interpret a full set of financial ratio based on financial projection

Section VII

Credit Analysis Based on Financial Model

7.1.	Differ valuation, feasibility and credit analysis and understand how to connect between methods
7.2.	Understand about financing needs of a company and how to fulfill the needs
7.3.	Understand and Calculate the general format of Cash Flow Available for Debt Service (CFADS) for Credit Analysis
7.4.	Understand the application of CFADS calculation on multi tranche financing
7.5.	Understand and Calculate Debt Service Coverage Ratio, Loan Life Coverage Ratio
7.6.	Understand how to model short term financing needs by using cash budget method
7.7.	Understand how to connect between CFADS, free cash flows, Enterprise Value and feasibility tools
7.8.	Explain the implication of change in one valuation, feasibility or credit analysis method on the simultaneous change of valuation, feasibility and credit analysis
7.9.	Explain how to take advantage on the valuation, feasibility and credit analysis connectivity to enhance analysis
7.10	Understand Altmann Z-Score Method and the application in financial model