FINANCIALMODELING INSTITUTE

LEVEL 2:
CHARTERED FINANCIAL MODELER (CFM)

BODY OF KNOWLEDGE

2018

Introduction

This Body of Knowledge is a reference document to help prospective candidates prepare for the Chartered Financial Modeler (CFM) exam.

The CFM exam is the second of three levels of modeling certifications offered by the Financial Modeling Institute.

Only people who have passed the Level 1: Advanced Financial Modeler (AFM) exam are eligible to write the Level 2: CFM exam.

This document contains important information on the modeling topics that candidates will be tested on during the CFM exam.

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I. Exam Overview

The first level of the FMI certification program, the Advanced Financial Modeler (AFM) exam, tested a candidate's ability to create an integrated, three-statement financial model of a company in a controlled environment with no resources, in under four hours.

Financial modeling proficiency requires both skill and speed and the AFM exam required candidates to demonstrate both of these traits in order to have successfully passed the exam.

The Level 2: CFM exam builds on the topics covered in the AFM exam, but tests a candidate's ability to quickly and efficiently solve problems and to create modeling solutions for more in-depth and complex corporate finance situations.

II. Exam Format

Like the AFM exam, the CFM exam will be conducted in a controlled environment, with no outside resources. Participants will have four hours to complete the exam.

During the CFM exam, candidates will be asked to complete between four to six discreet modeling cases. Each case will include a brief description of a business situation, some accompanying financial data, and a set of questions and/or tasks that need to be addressed. Candidates will need to build and submit the required analysis, schedules, and responses in Excel.

The cases will be challenging and will require candidates to have excellent problem solving and Excel skills in order to quickly build the required analysis in the allotted time.

Two sample cases are included at the end of this document. These cases provide examples of the type of material that could appear on the CFM exam, but the actual cases may differ in content and complexity.

III. Exam Topics

1. Revenues

For many companies, revenues are simply a function of prices multiplied by volumes. On the Level 1: AFM exam, candidates were asked to create a straightforward revenue schedule to forecast these variables for a given company.

There are many situations where a company's revenue calculations may get more complex. If a revenue case is provided on the CFM exam, it could require candidates to create a detailed revenue schedule that incorporates some or all of the following issues:

- **Divisional Allocations:** a company that has multiple divisions and inter-company transfers between the various divisions
- **Geography:** a company that has divisions in multiple jurisdictions and different price and volume dynamics by jurisdiction
- **Currency:** a company that has customers in many different countries and sale prices denominated in the local currency of each country
- **Capacity Constraints:** a company that creates multiple products and has capacity constraints by product
- **Operational Changes:** a company that plans to acquire or divest businesses over time
- **Contingent Revenue:** revenue is contingent on various probabilities of certain other occurrences or actions taking place

2. Operating and Non-Operating Costs

All costs for companies fall into two major categories: Fixed and Variable. On the Level 1: AFM exam, participants were expected to build a cost schedule to properly capture the dynamics between a company's fixed and variable costs.

On the CFM exam, candidates could be asked to build a cost schedule that incorporates some or all of the following issues:

- **Economies of Scale:** tiered pricing on some of the input costs, resulting in economies of scale when higher volumes are purchased
- **Multi-currency Costing:** the company purchases different products in various currencies, some of which are at spot rates and others at fixed contract rates
- **Semi-variable Costs:** the company has some semi-variable, or "step-function" costs (i.e. a cost that is fixed for a certain range of volume, but then jumps to another level once the company's volume exceeds a certain point)

3. Capital Expenditures and Depreciation

Most companies have some fixed assets, and all companies with fixed assets need to depreciate those fixed assets based on accounting rules. On the Level 1: AFM exam, participants were expected to create a simple depreciation schedule to calculate the straight-line depreciation expense for a company.

On the CFM exam, candidates could be asked to build a depreciation schedule that incorporates some or all of the following issues:

- **Different Methodologies:** a company that has multiple classes of assets and uses different methodologies to depreciate each class - for instance, one class might use straight line depreciation whereas a second class of assets might use the declining balance, or double declining balance method of depreciation
- **Purchases and Disposals:** a company that purchases or divests depreciable assets at specific times – this could also require the calculation of profit/loss on the sale of assets
- **Fully Depreciating Assets:** the remaining useful life of the assets is less than the number of forecast periods in the model

4. Working Capital

Most companies have some working capital issues. On the Level 1: AFM exam, participants were expected to build a simple working capital schedule based on a forecast of days that properly calculates the company's Accounts Receivables, Inventories, and Accounts Payables.

On the CFM exam, candidates could be asked to build a working capital schedule that incorporates some or all of the following issues:

- **Inventory Continuity Schedule:** a company produces more or less product than it sells each year which requires the creation of an inventory continuity schedule that can add or remove from inventory balances each year, but also factors these changes into the cost of goods sold
- **Monthly or Quarterly Working Capital:** calculate working capital correctly in a monthly or quarterly model without overstating or understating the working capital changes each period

5. Income Tax

Most companies are required to pay income tax when they are profitable. On the Level 1: AFM exam, participants were expected to build a simple income tax schedule that considered only basic timing differences between accounting rules and local tax rules.

On the CFM exam, candidates could be asked to build a tax schedule that incorporates some or all of the following issues:

- **Tax Losses:** calculate a company's current and deferred tax expense each year if it has tax losses from previous years, or it generates new tax losses that can be used to reduce taxable profits
- **Tax Loss Continuity Schedule:** create schedules to ensure that tax losses that expire soonest are used first, but also that they are not used beyond their expiry date
- **Multiple Jurisdictions:** calculate a company's income taxes if it has divisions in multiple jurisdictions, each of which has different tax rates, tax losses and reporting currencies
- **Effective Tax Rates:** calculate a company's effective tax rate if it has non-deductible expenses

Note: since tax issues are often country specific, participants are not expected to have knowledge or an understanding of the specific rules in various jurisdictions. Rather, participants are expected to have a general understanding of tax issues and be able to solve a generic tax problem on the exam in which all information required is provided in the case study.

6. Debt

Most companies have multiple pieces of debt as part of their capital structure. On the Level 1: AFM exam, participants were expected to build simple debt schedules for a revolving credit facility and a term loan.

On the CFM exam, candidates could be asked to model facets of a complex capital structure with any or all of the following issues:

- **Various Debt Features:** multiple pieces of debt with complex features, including excess cash flow sweeps on more than one piece of debt, interest rate pricing grids based on leverage ratios, capitalized interest, and paid-in-kind (PIK) interest
- **Covenants:** calculate various debt ratios (including Debt / EBITDA, interest coverage and debt service coverage) compared to covenants, and be able to track trailing twelve month data in monthly models
- **Debt Sculpting:** calculate principal repayments on a project according to a target debt service coverage ratio (DSCR)
- **Refinancing:** build debt refinancing functionality into debt schedules, including timing options, premiums, and calculate trailing interest expense based on the refinancing scenario

7. Equity

On the Level 1: AFM exam, participants were required to build simple schedule to track common and preferred equity balances, dividends and retained earnings.

On the CFM exam, candidates could be asked to model other equity issues, including:

- **Issuances / Buybacks:** build equity financing functionality into equity schedules, including timing options, net proceeds, and calculate pro forma shares outstanding (including weighted average)
- **Dilutive Securities:** track the impact of various dilutive securities including options, warrants and convertible debt, and incorporate these impacts into equity schedules and calculations
- **Tiered Equity Returns:** calculate dividends on various classes of equity, including different levels of priority, based on payout ratios and/or available cash flow

8. Subsidiaries

Companies sometimes own less than 100% of their subsidiaries which results in accounting and cash flow complexities. While modeling subsidiary interests was not required on the Level 1: AFM exam, it is a topic that may be covered on the CFM exam. Topics could include:

- **Non-controlling / Minority Interest:** model the financial statement impacts when a subsidiary is consolidated for accounting purposes but there are minority shareholders
- **Equity Method Investments:** model the financial statement impacts when a company uses the Equity Method to account for a minority ownership stake
- **Long-term Investments:** model the financial statement impacts when a company has long-term investments

9. Sensitivity Analysis / Summary Page Automation

Creating a dynamic, easy-to-interpret summary page is an important aspect of financial modeling. CFM candidates are expected to know how to create a well laid out summary page and automate the summary to dynamically show the results of multiple model scenarios.

Candidates will be expected to create a well laid out input section that allows for analysis of sensitivities and scenarios.

In addition, candidates may need to create functionality and controls that allow for dynamic exploration of multiple scenarios on a summary page (dashboard).

10. Timing Flexibility

Building timing flexibility for certain events and transactions is an important facet of more complex financial models. On the CFM exam, candidates could be asked to build automated timing switches to allow the model user to quickly choose the timing of product launches or financing transactions.

11. Model Checking

Quickly finding errors and inconsistencies in a model is a critical skill in the corporate finance world. On the CFM exam, candidates could be given a model with various embedded errors. Participants would then be required to use Excel techniques to efficiently discover and correct the errors without the use of third-party tools.

Candidates are expected to know how to include checks inside a financial model, and how to present these, including the concept of a master check to indicate that all other checks are OK, and how to include such a check inside a financial model.

12. Data Management

Strong financial modelers need to be able to manage large sets of data to analyze trends and help inform assumptions. CFM exam candidates may be given a large set of data from which they will be expected to use Excel tools and formulas to extract requested information.

IV. Sample Questions

The following pages contain two sample cases for the CFM exam. This exam will test advanced modeling topics. While these cases are indicative of the type of material that may be on the exam, the exam questions may include additional complexity.

Each case will contain a brief paragraph explaining the situation. Candidates are expected to model the relevant schedules in a dynamic and automated manner, otherwise they may run out of time. As with any modeling exercise, formatting and presentation are important.

The cases on the exam may require answers in multiple parts.

1. Tiered Equity Returns

Acme Inc. is a manufacturer of industrial parts used in the airline industry. The company is projected to generate Net Income before dividends according to the following table:

	2018	2019	2020	2021	2022
Net Income before Dividends	190,167	304,267	456,401	684,602	376,531

Common Equity in the Company is divided into two tranches, Class A Common Shares and Class B Common Shares. Dividends paid to Class B Common shareholders are targeted to be 5% of Net Income available to the class.

As of December 31, 2017, there were 650,000 Class A Common shares outstanding. In 2017, each Class A share paid an annual dividend of $0.05 per share. The Company has committed to increasing the dividend on Class A shares by 15% for each of the next five years.

In 2012, the Company issued $1,897,367 in Preferred Shares with an annual yield of 12%. Additional terms of the Preferred Shares are:

1. In the event there are insufficient funds available to pay dividends to holders of Preferred shares, such dividends that should have been paid will accumulate or accrue without interest
2. Such accrued funds will be paid in priority with any future available funds
3. In the event that there are any unpaid preferred share dividends, no dividends will be paid to any class of Common Shares

As of December 31, 2017, all Preferred Share dividends had been fully paid.

Tasks:

1. Build the schedule(s) required to determine the total amount of dividends paid by the Company.
2. The Company is evaluating the ability to issue a new $1.0 million tranche of Preferred Shares with the following terms:
    a. The new shares will be junior to the existing Preferred Shares
    b. Unpaid dividends will not accrue
    c. They will pay an annual dividend of $115 per $1,000 in face value
    d. The new tranche could be issued on January 1 in any year between 2020 and 2022, inclusive
3. Build the schedule(s) required to determine the total amount of dividends paid assuming the Company issues preferred shares in 2020, 2021, or 2022.

2. Fully Depreciating Assets

Galway Inc. is a manufacturer of industrial parts used in the automotive industry. The company is planning two aggressive capital spending projects over the next few years. Spending is expected to occur evenly throughout the year.

As of the most recent fiscal year end, the Company had a Net PP&E balance associated with buildings of $2,543 million. These assets had an estimated remaining useful life of 25 years.

In fiscal 2017, the Company spent $123.5 million on building-related improvements. Annual spending under the program is expected to grow by 7.5% per year over the next 10 years. Assets purchased under the program have an estimated useful life of 7 years and depreciation is to be determined using the double declining balance method (for this method, assume the annual depreciation rate is double what it would be using the straight line method).

The Company is also planning to start an IT department. Assets purchased are expected to have a 5-year useful life and will be depreciated using the straight-line method. The base plan involves spending $50 million in each of the next 10 years. The Company can also pursue an additional expansion based on the following schedule:

Year	Amount
Year 1	$5.0 million
Year 2	$15.0 million
Year 3	$7.5 million
Year 4	$20.2 million
Year 5	$60.7 million
Year 6	$1.0 million
Year 7	$0.3 million
Year 8	$0.0 million
Year 9	$0.0 million
Year 10	$0.5 million

Tasks:

1. Create a fully automated schedule to determine annual depreciation expense for each of the next 10 years assuming the IT additional expansion begins in the next fiscal year.
2. Determine the annual depreciation amount if the IT spending plan is delayed 1, 3, or 5 years.
3. Determine the annual depreciation amount if, on December 31, 2020, the company sells $500 million of building assets acquired prior to 2018. Assume that the assets are sold at their carrying value.
4. Calculate the Ending Net PP&E balance for each of the above scenarios (assuming they occur independently).

About the FMI

We are dedicated to excellence in Financial Modeling and offer globally recognized certifications.