PADM-GP 2148

Introduction to Structured Finance

Instructor Information

- Professor Laurence H. Wadler
- Email: lhw5@nyu.edu
- Phone: (201) 486-4242
- Office Address: NYU Zoom Room
- Office Hours: Monday 2:30pm-4:30pm and by appointment.
- Technical Workshops: Voluntary - to be coordinated during the semester.

Course Information

- Class Meeting Times: Mondays 4:55pm – 6:35pm
- Class Location: 194 Mercer Street, Room 306B

Course Description

We will study the process by which financing objectives are transformed into bond transactions and other opportunities to utilize structured finance products in the health and corporate finance sectors. The course will center on case studies of actual bond transactions that financed multiple new money (construction) and refunding projects as well as asset securitizations. We will learn the mathematics underlying financial structure and the governing conventions and vocabulary of structured finance. We will study the instruments of structured finance and how they manifest into structural form. Once we have developed this core understanding, we will review in detail the Official Statements and Offering Memorandums related to the case studies to begin our exploration of the structuring process.

All cash flow elements of the structuring process will be discussed in detail and formulated in EXCEL. Once a sufficient understanding of the purpose and protocols associated with the structuring process is developed, we will explore the bond structuring process using DBC Finance, the industry standard bond structuring software.

Course and Learning Objectives

The primary objective of the course is to develop structured finance proficiency within and without DBC Finance which is a capability that is highly desired by both public and private
sector municipal market participants during this time of historic social and environmental financing need.

During the semester you will:

1. develop fixed income cash flow modeling capability relevant to the type of debt being issued by domestic and international public finance entities,
2. develop a fundamental understanding of the types of financing instruments used to create structural form,
3. develop a fundamental understanding of structural form and how it is shaped to achieve transactional objectives,
4. develop the ability to structure real world transactions using DBC Finance, the industry standard tool used to size and structure transactions, and
5. develop a functional understanding of how asset securitizations are sized and structured.

<table>
<thead>
<tr>
<th>Course Learning Objective Covered</th>
<th>Corresponding Assignment Title</th>
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<td>(1), (2), &amp; (3)</td>
<td>Homework Assignments</td>
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<td>(4) and (5)</td>
<td>Term Project and Final Project</td>
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**Course Website**

The course website resides on the NYU Classes system and is accessible via the “Academics” tab on NYU Home.

**Assignment and Grading**

- Two homework assignments: 30%
- Term Project: 40%
- Take-home Final Project: 30%

For the Term Project you will size and structure a real world multi-purpose project finance transaction using DBC Finance. You can work from a standard set of specifications or I can customize your Term Project in accordance with your specific interests (for instance health care, housing, transportation, securitization, etc.).

**Required Readings**

I have assigned chapters from the following works. All have been ordered at the NYU Bookstore and are also available in print and in digital format from Amazon.

Additional readings of interest will be assigned on a weekly basis and made available on the Course Website.

**Recommended Financial Calculator:** HP 12C

**Instructional Videos:** To augment and extend classroom discussion, I will be creating a library of videos. The description of the videos and supporting material will be organized in the Videos folder of our class site.

**Academic Integrity**
Academic integrity is a vital component of Wagner and NYU. All students enrolled in this class are required to read and abide by Wagner’s Academic Code. All Wagner students have already read and signed the Wagner Academic Oath. Plagiarism of any form will not be tolerated and students in this class are expected to report violations to me. If any student in this class is unsure about what is expected of you and how to abide by the academic code, you should consult with me.

**Attendance**
I will not be keeping track of attendance but strongly encourage you to attend all classes in order that you can achieve a full and proper understanding of the course material.

**Detailed Course Overview**

Class 1 – January 24

**Introduction**

Topics:
- Syllabus Review
- Readings
- Overview of Course Objectives
- Discussion on the Nature of Finance (Finance as Convention)
- Financing Objectives: Project Finance
  - Refunding/Refinancing
- Defining Structured Finance

Readings:
• Fundamentals, Chapter 2, The Basics of Municipal Securities
• Tufte, Part 1, Graphical Practice, Chapter 1. Graphical Excellence
• Fabozzi, Chapter 1, Time Value of Money

Class 2 – January 31

The Mathematics of Cash Flow

Topics:
• Discussion of importance of fundamental understanding
• Modeling in EXCEL: o Debt service o Accrual periods o Day-Count protocols o Compounding o Present and Future Value

Readings:
• Fundamentals, Chapter 1, Overview of the Municipal Bond Market, Introduction
• Fundamentals, The Rating Agencies
• Tufte, Part 1, Graphical Practice, Chapter 2. Graphical Integrity
• Fabozzi, Chapter 3, Day Count Conventions and Accrued Interest

Class 3 – February 7

The Instruments of Structured Finance

Topics:
• Define:
  o Fixed Rate Bonds
  o Variable Rate Bonds
  o Current Interest Bonds
  o Serial Bonds
  o Term Bonds
  o Capital Appreciation Bonds
  o Hybrids
  o Derivatives
• Discussion of Yield
• Bond Pricing in EXCEL o Premium Bonds o Discount Bonds

Homework #1 Distributed

Readings:
• Tufte, Part 1, Graphical Practice, Chapter 3, Sources of Graphical Integrity and Sophistication
• Fundamentals, The Issuers
• Fabozzi, Chapter 5, Yield Measures

Class 4 – February 14
Introduction to Financial Structure

Topics:
• Define:
  o Dated date  o Delivery date  o
  First interest payment date  o
  First principal payment date  o
  Final principal payment date
• Introduction to Case Study
• Review of Case Study Official Statement

Homework #1 Due

Readings:
• Tufte, Part II, Theory of Data Graphics, Chapter 4, Data Ink and Graphical Redesign
• Fundamentals, Understanding Interest Rates
• Case Study Official Statement – Term Structure Section
• Fabozzi, Chapter 6, Analysis of Floating Rate Securities

Class 5 – February 28

Introduction to Project Finance Bond Sizing

Topics:
• Discussion and Examples of Sizing Elements  o Project Find  o Capitalized Interest Fund
  o Debt Service Reserve Fund  o Cost of Issuance Fund  o Revenue Fund

Readings:
• Tufte, Part II, Theory of Data Graphics, Chapter 5, Chart Junk: Vibrations, Grids and Ducks
• Fundamentals, The Primary Market
• Case Study Official Statement – Sources and Uses Sections
• Fabozzi, Chapter 2, Yield Curve Analysis

Class 6 – March 7

Project Finance Cash Flow Modeling

Topics:
• Sources and Uses Table
• Defining Net Funding and Gross Funding
• Modeling Project Finance Cash Flow Elements in Excel  o Net Funding of Project Fund
  o Net Funding of Capitalized Interest Fund  o Gross Funding of Debt Service Reserve Fund  o Constructing Sources and Uses Table
Homework #2 Distributed

Readings:

• Tufte, Part II, Theory of Data Graphics, Chapter 6, Data-Ink Maximization and Graphical Design
• Case Study Official Statement – Funding Flows sections
• Fabozzi, Chapter 4, Valuation of Option-Free Bonds

Class 7 – March 21

Introduction to Refunding/Restructuring Sizing

Topics:

• Define:
  o Escrow Requirements
  o Escrow Securities
  Escrow Cash Flow
• Modeling Refunding Cash Flow Elements in EXCEL
  o Escrow Requirements
  Escrow Portfolio Sizing
  o Escrow Cash Flow
  o Escrow Sufficiency
  o Escrow Yield

Homework #2 Due

Readings:

• Tufte, Part II, Theory of Data Graphics, Chapter 7 Multifunctioning Graphical Elements
• Fundamentals, Financial Products
• Refunding Case Study Official Statement - Plan of Finance Sections
• Fabozzi, Chapter 7, Valuation of Bonds with Embedded Options

Class 8 – March 28

Introduction to Structural Forms and Usage

Topics:

• Absolute Structural Forms
  o Level Debt Service
  o Level Principal
• Relative Structural Forms
  o Uniform
  Accelerated
  Deferred
  Proportional
  Fill
• Allocation of Case Study Aggregate Debt Service to Underlying Financing Purposes
• Discussion of Structural Forms and Financing Purpose

Readings:
• Tufte, Part II, Theory of Data Graphics, Chapter 8 Data Density and Small Multiples
• Fundamentals, Credit Analysis
• Refunding Case Study Official Statement – Sources and Uses/Debt Service sections
• Fabozzi, Chapter 16, Analysis of Interest Rate Swaps

Class 9 – April 4

Introduction to DBC Finance #1

Topics:
• Discussion of Objectives of the Structuring Process ○ Size the Transaction ○ Structure the Transaction
• Understanding the Inputs and Outputs of the Structuring Process
• DBC Finance: ○ Purpose ○ Architecture ○ Overview of Navigation
• Demonstrate Structuring of Case Study New Money Bonds. (Debt/Size Module)

Readings:
• Tufte, Part II, Theory of Data Graphics, Chapter 9 Aesthetics and Technique in Data Graphical Design, Epilogue: Designs for the Display of Information
• DBC Tutorial: Debt/Size
• Sample Issuer New Money Requests for Proposals
• Fabozzi, Chapter 12, Measuring Interest Rate Risk

Class 10 – April 11

Introduction to DBC Finance #2

Topics:
• Demonstrate Structuring of Case Study Refunding Bonds (Refund Module)

Readings:
• Fundamentals, Financial Products
• DBC Tutorial: Refund
• Sample Issuer Refunding Requests for Proposals
• Fabozzi, Chapter 15, The Tools of Relative Value Analysis

Term Project Distributed

Class 11 – April 18
International Structured Finance

Topics:
- Role of International Development Banks
- Challenges Associated with Project Financing in Emerging Markets
- Form and Structure of International Project Finance Transactions
- Challenges and Opportunities

Introduction to Asset Securitization #1

Topics:
- Sizing and Structuring Asset Securitizations
  - Discussion of Assets
  - Leveraging Process
  - Core Complexities
- Demonstration of Mortgage Back Security Structuring Part 1

Readings:
- Sample Issuer Requests for Proposals for Complex Finance Plans
- Sample multi-financing purpose transaction Official Statement
- Fabozzi, Chapter 17, Estimating Yield Volatility

Class 12 – April 25

- Guest Speaker:
  Mr. Patrick McCoy, Director of Finance
  Metropolitan Transportation Authority

Readings:
- Fundamentals, The Secondary Market
- Fabozzi, Chapter 8, Cash Flow for Mortgage-Backed Securities and Amortizing Asset-Backed Securities

Class 13 – May 2

Introduction to Asset Securitization #2

Topics:
- Demonstration of Mortgage Back Security Structuring Part 2
- Discussion of Other Asset Classes
  - Core Differences/Similarities
  - Impact on Structuring Process

Readings:
- Sample Collateralized Debt Obligation Offering Statement
• Fundamentals, Regulatory and Disclosure Requirements
  • Fabozzi, Chapter 9, Valuation of Mortgage-Backed and Asset-Backed Securities

Final Project Distributed

Class 14 – May 9

Review and Final Thoughts

Topics:
• Discussion of Final
• Review of Course Goals
• Reflections on the nature of finance and its impact on global prosperity
• Structured Finance as a Conscious Process
• Final Thoughts

Term Project Due

Henry and Lucy Moses Center for Students with Disabilities at NYU

Academic accommodations are available for students with disabilities. Please visit the Moses Center for Students with Disabilities (CSD) website and click on the Reasonable Accommodations and How to Register tab or call or email CSD at (212-998-4980 or mosescsd@nyu.edu) for information. Students who are requesting academic accommodations are strongly advised to reach out to the Moses Center as early as possible in the semester for assistance.

NYU’s Calendar Policy on Religious Holidays

NYU’s Calendar Policy on Religious Holidays states that members of any religious group may, without penalty, absent themselves from classes when required in compliance with their religious obligations. Please notify me in advance of religious holidays that might coincide with exams to schedule mutually acceptable alternatives.