

**NEW YORK UNIVERSITY**  
Stern School of Business  
Financial Modeling & Analysis

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**Office:** 10-87

**Office Hours:** T & Th: 5:15 – 7:30

**Lectures:** T & Th: 9:30 – 10:45 (Tisch UC24); 2:00 – 3:15 (KMEC 5-75); 3:30 – 4:45 (KMEC 5-75)

**Teaching Assistants:** Rachel Cui (rc2981); Kyle Law (kml615); Michelle Shin (ms8282)

### **Course Overview**

Making educated decisions today by forecasting operating and financial performance is a critical exercise for owners, managers, consultants, investment bankers, creditors, equity and credit analysts, and investors such as private equity groups, hedge funds, institutional investors and individuals. As we are ineluctably constrained by our inability to predict the future, financial projections are rarely perfect. Nonetheless, we endeavor to model several scenarios predicated on historical and anticipated results to derive various conclusions. There are myriad variables, which can certainly be incorporated into projections. However, the best financial model is always the one that is stable and robust, yet simple and easy to build, navigate and audit.

The goal of this course is to instruct step-by-step how to build a comprehensive, multi-purpose projection model in Excel and subsequently interpret selective operating, credit and equity valuation data. Based on this information, you will learn how to (i) evaluate a company's operating and financial performance, (ii) develop an appropriate capital structure by structuring debt and equity transactions which not only protect both the creditors and shareholders, but also create an appropriate risk and reward equilibrium, and (iii) formulate an educated investment opinion and propitiously time entry and exit trading points.

### **Prerequisites**

The prerequisites are Principles of Financial Accounting, Financial Statement Analysis and Foundations of Financial Markets. The knowledge and skills attained in these courses are essential in understanding how to build a financial model and interpret selective operating, credit and equity valuation data. You should also be very proficient in Excel before matriculating as this course is not designed to teach it.

### **Course Materials**

There is no textbook for the course. During the lectures, we will be utilizing a projection model in Excel to which you will have access via the course website. Each class you will need to bring your company 10-K, most recent 10-Q and a laptop with any version of Excel with sufficient battery power to last throughout the class session as you will be required to replicate the techniques learned to build your own financial model.

### **Grading**

Your grade is based on a class project which includes two or three deliverables and a presentation described below. A percentage of your grade will also be based on your attendance, participation and professionalism. The class project will provide you with the opportunity to apply the skills and analytical techniques learned in the classroom to an actual company. Upon completion of the project, you should have the confidence and ability to not only build a stable, robust projection model, but also to interpret selective operating, credit and equity valuation data.

By the first lecture, you will select a publicly-traded company listed on either the NYSE or NASDAQ. A list of all of the companies in the S&P 500 and S&P MidCap 400 Indices are posted on the course website to assist in your selection. However, you should neither select a financial services company nor a company with a financial services division to analyze as they can be difficult to navigate.

You will print the most recent 10-K, 10-Q and any other relevant SEC filings such as an 8-K from [www.sec.gov](http://www.sec.gov). These filings will serve as primary source documents for the project and provide the requisite foundation for building your assumptions embedded in your financial model. You should also avail yourself of recent press releases, news stories and any other pertinent information, which will ultimately deepen your knowledge of the company.

You will start by inputting into Excel three years of historical and year-to-date financial information, i.e. income statements, balance sheets and statements of cash flows. You will then begin to build a five-year projection model similar to the one we will be utilizing in class, which entails developing three case scenarios, i.e., downside, base and upside, and generating summary operating, credit and equity valuation data. The summary operating data will include profitability and liquidity statistics. The summary credit data will include capital structure and solvency statistics. The summary equity valuation data will include a discounted cash flow (DCF) valuation and several relative valuation multiples such as Price/Earnings, Price/Sales, Enterprise Value/EBITDA, Enterprise Value/Sales and Free Cash Flow Yield.

Your grade comprises the following:

- **First Deliverable (20%) – Income Statement Projections (Steps 1 – 43):** Upon completion of the income statement projections with the exception of depreciation and amortization and interest expense, you will submit a copy of your projection model, which includes the income statement and assumptions, and append it to a written report with a bibliography included not to exceed ten pages single spaced. The report should briefly introduce the company, its products and/or services, locations, competitive advantages, major customers, major suppliers, senior management, board of directors, auditing firm, and any major changes including acquisitions, divestitures or lawsuits. The introductory portion should be no more than one page. The balance of the report will include a detailed discussion of and rationale for each assumption in the three scenarios embedded in your forecasts corroborated by historical performance, recent developments and anticipated results. **Due Date: October 8, 2017 by midnight**
- **Second Deliverable (50%) – Balance Sheet Projections and Statement of Cash Flows (Steps 44 – 82):** Upon completion of the balance sheet projections and preparation of the statement of cash flows, you will submit a copy of your projection model, which includes the balance sheet, balance sheet assumptions and statement of cash flows, and append it to a written report not to exceed ten pages single spaced. The report will include a detailed discussion of and rationale for each assumption in the three scenarios embedded in your forecasts corroborated by historical performance, recent developments and anticipated results. Finally, you will e-mail the professor your projection model so that he may confirm its stability and that the balance sheet balances under all scenarios. **Due Date: November 12, 2017 by midnight**
- **In-Class Presentation (20%) –** You will be allotted no more than seven minutes to present to the class (i) a brief description of your company, (ii) an analysis of its profitability, liquidity and solvency statistics, (iii) a discussion of the equity valuation attained with the DCF and multiples, (iv) your investment opinion, and (v) technical indicators.

***If there is no slot available, you will be required to submit a third deliverable (20%) in lieu of the in-class presentation.*** You will submit a copy of the summary statistics, discount cash flow valuation and relative valuation, and append it to a written report not to exceed ten pages single spaced. The report will include a detailed discussion of (i) the operating data with an analysis of the profitability and liquidity, and (ii) the credit data with an analysis of the capital structure and solvency. This section of the report should only contain an analysis under the downside scenario as the goal is to assess the company's ability to generate cash flow and manage leverage in a challenging operating environment. The report will also contain (i) a detailed discussion of the equity valuation data with an analysis of the assumptions embedded in the DCF, (ii) the equity valuation calculated with the DCF versus the multiples, (iii) your opinion on the appropriate value of the stock predicated on your qualitative and quantitative analysis, and (iv) certain technical indicators used to propitiously time entry and exit trading points. The equity valuation section of the report should only contain an analysis under the scenario that you feel is most plausible for the company. **Due Date: December 14, 2017 by midnight**

- **Attendance, Participation and Professionalism (10%)**

## **Student Code of Conduct**

All students in Stern are expected to adhere to the Code of Conduct and uphold its values. Students must sign the Code, whereby they pledge to abide by the Stern Code of Conduct and acknowledge its imperative. Upon signing the Code, students not only recognize their personal responsibility in maintaining the Code of Conduct, but also acknowledge the consequences of violating the University's trust.

Students are required to submit their own work. Ideas, data, direct quotations, paraphrasing, or any other incorporation of the work of others must be clearly referenced. To do otherwise constitutes plagiarism. Students suspected of any form of plagiarism will be subject to disciplinary action.

Laptops, recorders and other electronic devices may not be used in class unless otherwise permitted. Cell phones and smartphones are never permitted in class and must be turned off prior to the commencement of each lecture.

Attendance is required and part of grade as indicated above. Absences are excused only in the case of documented serious illness, family emergency, religious observance, or civic obligation. If you will miss class for religious observance or civic obligation, you must inform the professor no later than the first week of class. Recruiting activities and business trips are not acceptable reasons for absence from class.

Students are expected to arrive to class on time and stay to the end of the class period. Arriving late or leaving class early will have impact on the course grade. Students may enter class late only if given permission by the professor and can do so without disrupting the class. Professors are not obligated to admit late students or may choose to admit them only at specific times, and professors are not obligated to readmit students who leave class.

Late assignments will either not be accepted or will incur a grade penalty unless due to documented serious illness or family emergency. Professors will make exceptions to this policy for reasons of religious observance or civic obligation, only when the assignment cannot reasonably be completed prior to the due date and the student makes arrangements for late submission with the professor in advance.

## **Syllabus**

The class lectures are based on a projection model of a fictitious publicly-traded company called Victory Sportswear, Inc. Each lecture we will deconstruct the financial model in detail and learn how to replicate it from scratch. As the process of building a projection model is a methodical, sequential process, the topics in the course will be covered in the order listed in the chart on the next page. There is no specified time frame for each step in the process as some will be covered more rapidly than others. Therefore, it is incumbent upon you to attend each lecture to ensure that you extract the most benefit from the course, and thus are able to build a financial model on your own.

Topic	Description
Introduction to the financial model	<ol style="list-style-type: none"> <li>1. Briefly introduce the financial model.</li> <li>2. Input the prior three years and year-to-date financial statements, and prepare the columns for a five-year projection model with the balance sheet audit formula (<math>A = L + SE</math>).</li> <li>3. Prepare the cover page and introduce the “CHOOSE” function as it pertains to inputting the downside, base and upside case scenarios.</li> <li>4. Enable maximum iterations in Excel to prevent circular references.</li> </ol>
Project the income statement	<ol style="list-style-type: none"> <li>1. Develop the assumptions for each scenario based on historical and anticipated results.</li> <li>2. Input those assumptions and link them to the appropriate cells in the income statement with the exception of D&amp;A expense, interest expense and rent expense.</li> <li>3. Discuss quality of earnings and non-recurring charges such as asset impairments, restructuring and gains and/or losses on asset sales.</li> </ol>
Project the balance sheet	<ol style="list-style-type: none"> <li>1. Develop the assumptions for each scenario based on historical and anticipated results.</li> <li>2. Input those assumptions and link them to the appropriate cells in the balance sheet and income statement with the exception of the cash, PP&amp;E and intangibles and debt accounts.</li> <li>3. Prepare a PP&amp;E and intangibles schedule with capex and D&amp;A expense.</li> <li>4. Capitalize off-balance sheet financings such as sales of accounts receivable and operating leases.</li> <li>5. Link the cells in the PP&amp;E and intangibles, capitalized accounts receivable and operating lease schedules to the appropriate cells in the balance sheet and income statement.</li> </ol>
Prepare the statement of cash flows	<ol style="list-style-type: none"> <li>1. Prepare the statement of cash flows from operating activities, investing activities and financing activities with the exception of borrowings and repayments of debt.</li> <li>2. Prepare the debt worksheet with each tranche of debt and learn how to write “IF” and “MIN” statements, revolver cash needs and repayments and cash waterfall payments.</li> <li>3. Link the cells in the debt worksheet to the appropriate cells in the balance sheet, income statement and statement of cash flows from financing activities.</li> <li>4. Link the ending cash balance on the statement of cash flows with the ending cash balance on the balance sheet.</li> </ol>
Prepare the summary pages	<ol style="list-style-type: none"> <li>1. Test the financial model to ensure stability and that the balance sheet balances under all scenarios.</li> <li>2. Prepare and analyze the summary operating, credit and equity valuation pages after linking them to the appropriate cells in the projection model.</li> </ol>
Introduction to LTM, M&A and recapitalization	<ol style="list-style-type: none"> <li>1. Prepare an LTM and normalization of earnings analysis of the income statement.</li> <li>2. Introduce a transaction financial model for a merger, acquisition, divestiture, LBO and debt or equity recapitalization.</li> </ol>
Introduction to technical analysis	<ol style="list-style-type: none"> <li>1. Introduce how to develop a trading strategy which includes an analysis of (i) trends, (ii) reversal and continuation patterns, (iii) volume indicators such as OBV, (iv) moving averages such as the 50- and 200-day, and (v) oscillators such as RSI and MACD.</li> </ol>