UNIVERSITY OF TORONTO

ECO 404| Topics in Managerial Economics |Fall 2012 | Department of Economics (St. George) |

Course Description

Students in this course will write papers and analyze and present case studies on the following topics (in the Fall 2012 semester): Yield management in airlines; By-product synergies and environmental regulation of styrene; Process/operations management; Forecasting demand for hotel rooms using time series methods; Hedonic price regression models for diamonds; Dairy futures options; Modeling the R&D race to develop artificial human insulin; Accounting of Frequent Flier Programs; Game theoretic analysis of future price scenarios; Valuing ships via financial valuation methods; Valuation of a M&A LBO deal using APV and WACC; Using real options to bid on a Copper and Zinc mine (including forecasting Copper and Zinc spot and future prices using Brownian motion methods).

We will do a case each week (see schedule below). The first 1.5 hours of each lecture will be an intensive "Socratic style" discussion of the case in which all students (except the presenters – see below) will be cold called and asked to present their quantitative analysis (for example: Excel, Matlab, R, etc.). The discussion will be followed by a 30 – 40 minute presentation by a randomly chosen group of three to four students (the group is chosen in the previous week), followed once again by a discussion. The presentation must be in PowerPoint with an overview, analysis, recommendations and backup slides and Excel (or Stata/Matlab/R) models. All students will present two cases over the semester and each student must write two 10 page papers on a case *other than the case they have presented* – this will be assigned on a random basis at the end of the presentation in each class. There are no exams, tests or quizzes in the course.

Prerequisites

All students *must* meet the following pre-requisites (it is your responsibility to ensure you meet these prerequisites (no exceptions)):

- ECO 200 **(**minimum grade of 75%**)/** ECO 204 **/** ECO 206
- ECO 220 **/**ECO 227**/(**STA 250**,** STA 255**)/(**STA 257**,** STA 261**)**
- At least one FCE in ECO at the 300 level or higher
- *Highly recommended preparation*: ECO 374**/** ECO 375

Course Staff

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Course Evaluation

- 40% = Two Group Presentations (20% for each presentation)
- 30% = All class discussion, debates and participation combined. See below for penalty on missing class.
- 30% = Two 10 papers with Excel/Matlab/R/etc. models combined (15% for each paper/model). See below for penalty on failure to submit papers or late submissions.

    - Please note:
        - Each week a group of three to four students will be randomly selected to present a case the following week (questions for the case will be posted the week before)
        - Once a student has presented he/she won't present the next case until all other students have been made a presentation
        - The presentation *must* be in Power Point, limited to the time frame in the case, and contain a non-trivial overview of the case and in-depth analysis and extensions of case questions. It is expected that the group will have backup slides and Excel/Stata/Matlab models. Please ensure the presentation is professional looking, well organized and free to typos. Please purchase a laser pointer and use it in the presentation.
        - Presentations will be graded on organization, depth and range of analysis, quality of presentation and preparation.
        - If you are supposed to present a case and fail to do so then 20% of the total grade will be deducted
        - If you are supposed to discuss/debate a case: 3% of the total grade will deducted for each class session you miss

- If you are supposed to write a short paper on a case: 15% of the total grade will deducted for each failure to submit the paper by the next class and/or for each class session you miss
- A penalty of 5% (max 15%) will be imposed on the total grade for each day that a paper is over due

Academic Integrity

Academic integrity is one of the cornerstones of the University of Toronto. It is critically important both to maintain our community which honors the values of honesty, trust, respect, fairness and responsibility and to protect you, the students within this community, and the value of the degree towards which you are all working so diligently. According to Section B of the University of Toronto's ***Code of Behavior on Academic Matters*** which all students are expected to know and respect, it is an offence for students:

- To obtain unauthorized assistance on any assignment. showing another student completed work (e.g., an answer in a test)
- To falsify or alter any documentation required by the University. This, includes, but is not limited to, doctor's notes.
- To use or possess an unauthorized aid in any test or exam

There are other offences covered under the **Code** but these are by far the most common. Please respect these rules and the values which

Course Schedule

Note: The following cases and notes can be purchased from the Harvard Business School Press. Go to http://cb.hbsp.harvard.edu/cb/access/15495257 → register as a student → pay by credit card → download the following cases and Excel supplements to your computer (all files are in .pdf or .xls format):

Class # 1: September 13:

- **Introduction and Yield Management Mini-Case (in class)**
- Next week's group chosen randomly

Class # 2: September 20:

- Discussion followed by presentation.
- ***Cook Composite and Polymers Co***.
    - This case describes how a company improves resource efficiency and process quality in its manufacturing process by developing a waste by-product into a new product. The case describes how CCP cleans production equipment between batches using styrene, which becomes a costly hazardous waste. Having worked on minimizing waste for the past 20 years, CCP believed it could not reduce the use of styrene without risking product quality. Instead, CCP was exploring the development of a by-product from its "rinse styrene," but faces uncertainty regarding the operational, financial, and environmental implications of doing so. This case contains data to support quantitative analyses of financial, operational, and environmental issues including some basic life-cycle analysis (LCA) calculations that focus on greenhouse gas emissions.
- Next week's group chosen randomly
- 2 students chosen randomly to write a 10 page on the case.

Class # 3: September 27:

- Discussion followed by presentation.
- ***Lorex Pharmaceuticals***
    - In this case, the managers of quality assurance must specify a fill-target for individual bottles of a new blood-pressure medicine. Higher targets lead to higher material costs but fewer seconds.
- Next week's group chosen randomly
- 2 students chosen randomly to write a 10 page on the case.

Class # 4: October 4:

- Discussion followed by presentation.
- ***Marriott Rooms Forecasting***
    - The manager of a large downtown hotel has to decide whether to accept 60 additional reservations or not. If she accepts, she will be overbooked and face certain costs if all the people holding reservations show up. The manager must forecast, based on historical data, how many of the people holding reservations will show up and then decide, after taking into account the cost involved, whether to take the additional bookings. The case can be used in a class on seasonality and exponential smoothing in time-series forecasting.
    - In conjunction with:
        - ***Time Series Forecasting***
            - This technical note introduces (1) approaches to forecasting in general, (2) simple moving averages and exponential smoothing, (3) accounting for seasonality in forecasting, (4) accounting for trend in forecasting, and (5) implementing a forecasting model. Holt and Winter models for exponential smoothing are included.
- Next week's group chosen randomly

- 2 students chosen randomly to write a 10 page on the case.

Class # 5: October 11:

- Discussion followed by presentation.
- ***The Professor Proposes***
    - A professor (not me) is shopping for a diamond engagement ring. He finds one with certain specifications for a certain price, and wishes to determine if the price of the diamond is fair. He collects data on the prices and characteristics (cut, color, clarity, and carats) of several hundred diamonds from three Internet wholesalers. Can be used for linear regression analysis with categorical variables as well as other statistical techniques.
- Next week's group chosen randomly
- 2 students chosen randomly to write a 10 page on the case.

Class # 6: October 18:

- Discussion followed by presentation.
- ***Milk and Money*** [with data supplement]
    - The financial success of dairy farms depends critically on the price of their main output, milk. Large volatility in the price of milk poses a considerable business risk to dairy farms. This is particularly true for family-run dairy farms. The question then arises: how can a farm owner hedge the milk price risk? The standard approach to establish a price floor for a commodity such as milk is to purchase put options on commodity futures. At the Chicago Mercantile Exchange, farmers can buy put options on the price of a variety of milk products. However, the price a farm receives for its milk depends on many factors and is unique to the farm. Thus, a farmer cannot directly buy put options on the price he receives for the milk his farm produces. Instead the farmer needs to determine which of the options available for trade at the Chicago Mercantile Exchange offer the best hedge for his own milk price. The assignment in this case is to examine historical data on several prices of milk products and the milk price received by a family-run dairy farm in California. Students need to find the price that is most closely correlated to the farm's milk price and to then choose options with the appropriate strike price that serve as the best hedge for the farm's price risk.
    - In conjunction with:
        - ***Note on Basic Option Properties***
            - Options are contracts that give the right, but not the obligation, to either buy or sell a specific underlying security for a specified price on or before a specific date. Explains the basis of options, covering fundamentals such as option terminology, the payoff schemes of options, parameters that influence their value, the put-call parity, and the upper and lower bounds of options prices. Presents problems for students to solve.
- Next week's group chosen randomly
- 2 students chosen randomly to write a 10 page on the case.

Class # 7: October 25:

- Discussion followed by presentation.
- ***Race to Develop Human Insulin***
    - Describes the race to develop human insulin.
    - In conjunction with:
        - ***R&D Race***
            - Two firms are engaged in a race to develop a new process. Various strategic aspects of the race are analyzed.
        - Does AMD Spur Intel to Innovate More? *Journal of Political Economy*, December 2011 (JSTOR)
- Next week's group chosen randomly
- 2 students chosen randomly to write a 10 page on the case.

Class # 8: November 1:

- Discussion followed by presentation.
- ***Accounting for Frequent Fliers***
    - Airline frequent flier programs offer members the opportunity to earn free flights by accumulating mileage. Accounting and reporting the obligations of airlines and the cost of frequent flier programs raises difficult measurement issues. In 1991, the U.S. Securities and Exchange Commission began to require airlines to disclose the number of free flights program members took. The case allows estimates of the cost and obligations of the United Air Lines program.
- Next week's group chosen randomly
- 2 students chosen randomly to write a 10 page on the case.

Class # 9: November 8:

- Discussion followed by presentation.
- ***Bitter Competition: The Holland Sweetener Company vs. NutraSweet Co.***

    - The NutraSweet Co. has very successfully marketed aspartame, a low-calorie, high-intensity sweetener, around the world. NutraSweet's position was protected by patents until 1987 in Europe, Canada, and Japan, and until the end of 1992 in the United States. The case series describes the competition that ensued between NutraSweet and the Holland Sweetener Co. (HSC) following HSC's entry into the aspartame market in 1987. Describes the subsequent move and countermove in both the marketplace and the courts. Also, discusses the business "game" that takes place at both the tactical and value levels. Ends with the final countdown to the expiration of NutraSweet's U.S. patent.
- Next week's group chosen randomly
- 2 students chosen randomly to write a 10 page on the case.

Class # 10: November 15:

- Discussion followed by presentation.
- ***Compass Maritime Services, LLC: Valuing Ships*** (with data supplement)
    - Tom Roberts, a founding partner of Compass Maritime Services, a New Jersey-based shipping research and consulting firm, has been asked by a new potential customer in May 2008 for advice on purchasing a capesize bulk carrier. After identifying a suitable ship with his colleague Basil Karatzas, they must determine an appropriate offer price for the ship and justify their recommendations.
- ***Ocean Carriers*** (with data supplement)
    - In January 2001, Mary Linn, vice president of finance for Ocean Carriers, a shipping company with offices in New York and Hong Kong, was evaluating a proposed lease of a ship for a three-year period, beginning in early 2003. The customer was eager to finalize the contract to meet his own commitments and offered very attractive terms. No ship in Ocean Carrier's current fleet met the customer's requirements. Mary Linn, therefore, had to decide whether Ocean Carriers should immediately commission a new capsize carrier that would be completed two years hence and could be leased to the customer.
- Next week's group chosen randomly
- 2 students chosen randomly to write a 10 page on the case.

Class # 11: November 22:

- Discussion followed by presentation.
- ***Valuation of AirThread Connections*** (with data supplement)
    - A senior associate in the business development group at American Cable Communications, one of the largest cable companies in the U.S., must prepare a preliminary valuation for acquiring AirThread Connections, a regional cellular provider. The acquisition would give American Cable access to wireless technology and the wireless spectrum and enable the company to offer competitive service bundles including wireless, currently a hole in the company's service offering. Students learn the basic valuation concepts including DCF (discounted cash flow) using APV (adjusted present value) and WACC (weighted average cost of capital) and they must choose the appropriate approach for situations in which the capital structure is changing or assumed to be constant. Students must consider the effect of constant debt versus the D/V (debt-to-value ratio) in estimating betas and the costs of capital. In addition, students analyze the effects of non-operating assets on valuation. As an additional assignment, instructors can require students to consider the personal tax disadvantage of debt as well as the synergies American Cable expects to achieve following the acquisition
        - In conjunction with:
            - ***Valuation Methods and Discount Rate Issues: a Comprehensive Example***
                - Presents a comprehensive review of the valuation methods based on discounting cash flows or value creation metrics and shows, through simple example and a straightforward "how-to-do" framework, the perfect consistency and identity of their results under similar assumptions.
            - ***Note on Cash Flow Valuation Methods: Comparison of WACC, FTE, CCF and APV Approaches***
                - This note intends to clarify various discounted cash flow valuations and their usefulness. It examines how different methods analyze cash flow from different perspectives but finally arrive at an identical decision.
            - ***Using APV: a Better Tool for Valuing Operations***
                - For the past 25 years, managers have been taught that the best practice for valuing assets--that is, an existing business, factory, product line, or market position--is to use a discounted-cash-flow (DCF) methodology. That is still true. But the particular version of DCF that has been accepted as the standard--using the weighted-average cost of capital (WACC)--is now obsolete. Today's better alternative, adjusted present value (APV), is especially versatile and reliable. It will likely replace WACC as the DCF methodology of choice among generalists. Like WACC, APV is used to value operations, or assets-in-place. Timothy Luehrman explains APV and walks readers through a case example designed to teach them how to use it.
- Next week's group chosen randomly
- 2 students chosen randomly to write a 10 page on the case.

Class # 12: November 29:

- Discussion followed by presentation.
- ***Bidding for Antamina*** (Real Options Monte Carlo simulation here)
    - In June 1996, executives of the multinational mining company RTZ-CRA contemplate bidding to acquire the Antamina copper and zinc mine in Peru. The Antamina project is being offered for sale by auction as part of the privatization of Peru's state mining company. RTZ-CRA has to determine what the mine is worth and decide whether and how it should bid in the upcoming auction. The bidding rules put in place by the Peruvian government dictate that each company's bid contain two components: an up-front cash amount and an amount the bidder will invest to develop the property if development is warranted after further exploration is completed
    - In conjunction with:
        - ***Copper and Zinc Markets – 1996***
            - Provides background information on copper and zinc markets as of mid-1996. Discusses supply and demand conditions, forecasts of the spot prices of the metals, and contracts for future delivery (forwards, futures, and options)
        - Bidding for Antamina
            - Provided information on Brownian motion methods for forecasting commodities spot, future and forward prices.
- 2 students chosen randomly to write a 10 page on the case.