ECO 404, SPRING 2017

ECONOMICS, U TORONTO (STG), AJAZ HUSSAIN

■ University of Toronto (STG) ■ Department of Economics (St. George) ■ ECO 404 ■ Topics in Managerial Economics ■ Spring 2017

Course Description:

In this seminar style course, students will engage in Socratic style analysis/discussions, write ten one-page memos, write two 10-15 page papers (with Excel models), and make two group presentations on the following quantitative/data driven cases (this list is for spring 2017): DCF valuation of bio-tech firms; Time series forecasting of occupancy rates for a major hotel chain; Hedging risk via financial options for an underlying asset that *isn't* traded on the CME; Modeling commodity prices via "Brownian Motion" techniques; Quantifying a low cost carrier's "financial edge" due to faster turnaround times and network structure; Pricing model with tradeoffs between margins and probability of sales; Analyzing mutual fund managers' performance; Econometric models of market segments to assist with marketing strategies; When to value assets by DCF *vs.* "comps" *vs.* "cost of replacement" approach?; Monte Carlo models of decision making under uncertainty with uncertain parameters (such as probability of success/failure); Pricing and output levels of products with "by-product synergies"; The economics of off-shore drilling industry; The economics of multi-stage bio-tech R&D investment races; Measuring price promotion effects across multiple products sold in multiple locations over several periods.

The classes are structured as follows:

- Lecture 1 (Thu, Jan 12): In the first half of this lecture, I will introduce the course. In the second half of this lecture we will discuss the "Milk and Money" case (please read this case as well as the note on "Futures and Options" *before* class – see below on how to procure the case). Please submit a one-page memo summarizing the Milk and Money case at the *beginning* of class. While discussing the Milk and Money case, I will introduce and demonstrate Stat-Tools in class (you should bring your laptop preloaded with StatTools or any econometrics software). At the end of the first lecture, I will randomly select two-three students to present the "Milk and Money" case in the first half of the *next* class. I will also randomly select the case to be discussed in the *next* class.
- Lecture 2 onwards: At the beginning of the class, all students – except the ones who are presenting that day – will submit a one-page memo summarizing the case chosen for discussion in this lecture (this case would've been chosen in the previous class). In the first half of the lecture, the students chosen at random in the previous class will make a group presentation (on the case discussed in the previous class). In the second half of the lecture, all students will discuss the case assigned for this lecture. At the end of the lecture, I will randomly select two-three students to present the case discussed that day in the first half of the *next* class and randomly select the case to be discussed in the *next* class as well as randomly choose two students to write a 10-15 page paper (along with any Excel files) on that case presented that day.

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:

Instructor: "Ajaz" Hussain
Office: Room 212, 150 St. George Street
E-mail: Sayed.hussain@utoronto.ca
Office Hours: Wednesdays 5:30 – 6 pm in GE 212/213

TA: William Gaelan MacKenize
E-mail: gaelan.mackenzie@mail.utoronto.ca

Course Material:

(Required) ECO 404 Spring 2017 HBS Course Pack. Please register as a student, pay by credit card, and download all materials to your computer.
(Required) Excel (Windows on non-Apple machines). Please add-in "Solver" and "Data Analysis" and install FRED Excel Add-in and Monte-Carlo Simulations Add-in
(Required) Stat-Tools (or any econometrics package like Stata, R, etc.). Useful resource: Ajaz's Excel Lessons on YouTube (including tutorials on Stat Tools).

Course Evaluation:

ECO 404 SPRING 2017		
% of Course Grade	**Component**	**Date**
20%	Active Class participation/discussion	Continuous
10%	Ten one-page memos (each memo 1%)	Continuous
20%	1st Group Presentation 1 (1st half of the course)	Case and group assigned randomly
15%	1st 10 – 15 page paper (1st half of the course)	Topic assigned randomly
20%	2nd Group Presentation 2 (2nd half of the course)	Case and group assigned randomly
15%	2nd 15 – 20 page paper (2nd half of the course)	Topic assigned randomly

Notes on Group Presentations:

Presentations must be *at least* 30 minutes long (preferably 45 minutes long), done in PowerPoint, and with every group member presenting in formal attire. Please upload the presentations on the "Presentations Tab" in Blackboard by 9 am of the due date. There will be an aggressive Q&A session following the presentation. Recommended (loose) template for presentations:

- Introduction and opening remarks ("statement of the central issue(s)")
- Agenda
- Overview & Background
- [If applicable] Data description with summary stats, graphs, and charts

- Analysis (please list regressions in a single table and report t-stats and/or p-values). Here is an excellent example.
- Recommendations/conclusion
- Backup slides and models (you should be able to bring these up in real time)
- You cannot "go outside" the case; i.e. stick to the facts and data in the case.

Here are two "old" examples of "professional" presentations: SH&E (Airline Consulting Firm) Presentation and Goldman Sachs Presentation to Brown University Corporate Finance 2nd year Undergrad students.

Penalty for failure to present due to absence: a mark of 0 will be given unless a valid reason is provided within one calendar day for why the presenter missed the presentation. Please e-mail the instructor for an appointment on how to submit an original University of Toronto medical certificate (photocopies or emailed certificates will NOT be accepted). The note must list the physician's OHIP number and clearly state that on the day of the presentation you were too sick to make the presentation. "Illness before the presentation" or statements that you "would have performed sub-optimally" are NOT sufficient grounds for missing presentations. If you are excused for missing a presentation, then you must write a 25 page paper (excluding title page) on one of the cases in the course packet to be assigned by the instructor. An individual presenter's grade may be further reduced if the rest of the group files a formal complaint by e-mail that this student was a "free rider" or "dropped the ball". Presenters will be graded on an individual basis according to the following rubric:

Group Presentation Rubric				
	Excellent	Good	Fair	Problematic
Score:	3	2	1	0
Case Analysis: Arguments, Evidence, Understanding	Clearly identifies salient issue[s] in case. Effective and forceful arguments based on solid economic and (if applicable) econometric analysis. Demonstrates sound understanding of issues and economic/econometric concepts. Clear recommendations and/or findings.	Adequate identification of salient issue[s] in case. Somewhat effective arguments based on adequate use of economic and (if applicable) econometric analysis. Demonstrates adequate understanding of issues and economic/econometric concepts. Adequate recommendations and/or findings.	Inadequate identification of salient issue[s] in case. Poor and/or invalid arguments based on sparse use of economic and (if applicable) econometric analysis. Demonstrates inadequate and/or confused understanding of issues and economic/econometric concepts. Inadequate recommendations and/or findings	Misidentifies salient issue[s] in case. Incorrect arguments which are not based on economic and (if applicable) econometric analysis. Demonstrates little to no understanding of issues and economic/econometric concepts. Lacks recommendations and/or findings
Organization & Flow: Clarity, Conciseness, Structure, Flow, Grammar, Interest to	Presentation has excellent structure and flow. Slides are properly formatted and titled, and effectively and succinctly convey information and/or arguments. Data and	Presentation has less than stellar structure and flow. Some issues with formatting and titles. Slides inadequately convey information and/or arguments. Inadequate	Presentation has poor structure and flow. Major issues with formatting and titles. Slides fail to adequately convey information and/or arguments. Data and econometric	Presentation lacks structure and flow. Lots of major issues with formatting and titles. Slides do not convey information and/or argument. Data and econometric analysis (if

Audience	econometric analysis (if applicable) presented clearly and effectively. Clear, effective tables, graphs, charts, etc. Excellent backup slides for the Q&A session effectively demonstrating "behind the scenes" analysis. Minimal (if any) errors.	presentation of data and econometric analysis (if applicable). Ineffective use of tables, graphs, charts, etc. Backup slides inadequate for Q&A session and ineffectively demonstrating "behind the scenes" analysis. A few minor errors.	analysis (if applicable) shoddily presented. Poorly organized tables, graphs, charts, etc. Backup slides completely inadequate for Q&A session and for demonstrating "behind the scenes" analysis. Many minor errors.	any) poorly or not presented. Poor, ineffective, use of tables, graphs, charts, etc. No backup slides for demonstrating "behind the scenes" analysis. Many major errors.

Notes on Papers:

Except for the first and last lectures, two to three students (other than the students who are making the presentation) will be chosen at random (after the presentation) to write a 10-15 paper on that day's case. The paper must be submitted through "paper" assignment tab Blackboard at the beginning of due date. Here's a recommended loose template:

- Introduction and opening remarks ("statement of the central issue(s)")
- Agenda
- Overview & Background
- [If applicable] Data description with summary stats, graphs, and charts
- Analysis (please list regressions in a single table and report t-stats and/or p-values). Here is an excellent example.
- Recommendations/conclusion
- Highly recommended "style guides": Economist Magazine Style Guide and The Elements of Style

Penalty for late submissions: 50% per calendar day that the paper is late. Students will be graded on an individual basis according to the following rubric:

Paper Rubric				
	Excellent	Good	Fair	Problematic
Score:	3	2	1	0
Economic Argument, Concepts & Evidence	Clearly stated argument & concepts. Economic reasoning is sound and indicates thorough understanding of concepts discussed in class.	Fairly clear and convincing argument. Adequate use of economic concepts. Demonstrates understanding of topics discussed in class.	Argument is confusing or contradictory. Weak definition/application of economic concepts. Demonstrates some understanding of topics discussed in class.	No clear argument. Confused or no use of economic concepts. Poor quality and little if any displayed evidence of understanding of topics discussed in class.
Organization & Flow	Each main point is written in a separate paragraph, in a logical	Each reason is written in paragraphs, but not	Reasons are not written in distinct paragraphs. Closing gives a call to action,	Reasons are not written in good paragraphs and have

	order. Article closes with a clear and convincing call to action.	necessarily separate. Closing gives a fairly clear and convincing call to action.	although not well supported.	questionable order. No clear or convincing call to action at close.
Writing – Clarity, Conciseness, Sentence Structure, Grammar, Active Voice, interest to Reader	Easy to read, even for a non-specialist. Writing enhances understanding and interest. Short, clear, correctly structured sentences with active voice throughout. Minimal (if any) errors.	Mostly easy to read. Mostly short, clear, correctly structured sentences with active voice. A few minor errors.	Sentence/word level problems get in the way of understanding, distracting reader in places. Some passive voice and/or jargon.	Significant sentence/word level problems make it difficult for reader to understand argument. Considerable passive voice and/or jargon.

Notes on Class participation:

You will be cold called and expected to answer questions and discuss and analyze the case in real time. Penalty for failure to read/prepare the case before class and/or failure to bring case to class: a mark of 0 will be given unless the student writes a 15 page paper (excluding the title page) on one of the cases in the course packet to be assigned by the instructor. Failure to write paper will result in a double penalty, i.e. $(50/6)\%$ of final grade penalty.

Penalty for missing a class: a mark of 0 will be given unless a valid reason is provided within one calendar day for why you missed the class. Please e-mail the instructor for an appointment on how to submit an original University of Toronto medical certificate (photocopies or emailed certificates will NOT be accepted). The note must list the physician's OHIP number and clearly state that on the day of the class you were too sick to attend the class. "Illness before the class" or statements that you "would have performed sub-optimally" are NOT sufficient grounds for missing classes. If you are excused for missing a class, then you must write a 15 page paper (excluding title page) on one of the cases in the course packet to be assigned by the instructor. Failure to write paper will result in a double penalty: i.e. missed class → failure to submit paper → $(50/6)\%$ of final grade penalty.

Students will be graded on an individual basis according to the following rubric:

Class Participation Rubric				
	Excellent	Good	Fair	Problematic
Score:	3	2	1	0
Case Preparation and Discussion:	Able to recall and discuss salient issues of the case without looking at the case in real time. Has analyzed case before class and effectively contributes to the case discussion and analysis. If applicable, conducts real time analysis (including econometric analysis)	Unable to recall and discuss salient issues of the case without looking at the case in real time. Barely analyzed case before class and adequately contributes to the case discussion and analysis. If applicable, barely conducts real time analysis (including econometric analysis)	Cannot recall and discuss salient issues of the case even by looking at the case in real time. Has not analyzed case before class and does not contribute to the case discussion and analysis. If applicable, does not conduct real time analysis (including econometric analysis)	Makes no contribution whatsoever

E-mail Policy:

Please e-mail Sayed.hussain@utoronto.ca for all course related "administrative" matters. E-mail is not an appropriate forum for discussing details which is why we have set aside office hours. That said, email can be helpful on occasion, and within limits and we will try to reply to email within 24 hours (except weekends) provided your question(s) can be answered with a one or two sentence answer. I won't answer questions about information already on the ECO 404 website nor questions about grades. I strongly recommend using UToronto email addresses (University policy stipulates a preference for U of T email addresses). Always identify yourself in your email and please do not send attachments and do not submit term work by email.

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 offense 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; to continue writing the exam after being instructed to stop writing. There are other offenses covered under the Code but these are by far the most common. Please respect these rules and the values which they protect.

Cases & Readings

Orexigen: Valuing Contrave (Data set in the course packet)

In January 2013, small biotechnology firm Orexigen was in the final stages of testing Contrave, a promising new pharmaceutical product for the treatment of obesity. At the time, Orexigen had no products in the market, so all its hopes of financial success rested on this new treatment. Contrave had proven to be highly effective in clinical trials, and Orexigen executives were confident it would receive FDA approval. At the same time, a much larger pharmaceutical company was considering acquiring Orexigen. Because the decision to acquire would ultimately be a financial one, the project team from the large company had to complete a valuation for Orexigen's only significant product in its pipeline, Contrave. What was the new product actually worth?

Southwest Airlines: In a Different World

This is the fourth in a 35-year series of HBS cases on an organization that has changed the rules of the game globally for an entire industry by offering both differentiated and low-price service. The focus of the case is on whether Southwest Airlines should buy gates and slots to initiate service to New York's LaGuardia airport, which does not fit the airline's profile for cost, ease of service, and other factors. The bigger issue is how the organization should deal with competition that has successfully emulated more and more of what it does in an operating environment that has changed significantly. Hence the subtitle, which was suggested by Herb Kelleher, Southwest's Chairman and CEO, Emeritus

Milk and Money and Note on Basic Option Properties (to be discussed Thu, Jan 15th) (Data set in the course packet)

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.

Milk and Money:
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. Data supplement in case packet.

Compass Maritime Services, LLC: Valuing Ships (Data set in the course packet)
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. Data supplement in case packet.

Gold Claim at Sturgeon Lake
A freelance geologist was asked for advice regarding two mining claims to property on Sturgeon Lake, near Thunder Bay, Ontario. Specifically, he was asked if there was enough gold on the property to pursue an economically feasible mining opportunity. The geologist determined that an analytical approach would best aid the analysis of the multiple factors he would need to consider in arriving at a decision about whether or not to proceed with the mining operation. The first stage in ore extraction involved building an access road, and the second stage was to implement a drilling program. There was considerable uncertainty surrounding the costs and actual feasibility of completion of these stages; yet only when these stages were completed could actual mining of the property begin. If mining proceeded, it was assumed it would take 10 years to extract all the gold from the site, and the total amount of gold in the mine would be extracted at an even rate over the 10-year period. Mining costs were assumed to be $30 an ounce, and the geologist used a discount rate of 20 per cent before taxes when evaluating projects. Use the FRED Excel add-in to download gold prices series (choose the 10am London gold prices series).

Time Series Forecasting and Marriott Rooms Forecasting (Data set in the course packet)
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.

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. Data supplement in case packet and here

Tupelo Medical: Managing Price Erosion (Data set in the course packet)
Robert Davidson, pricing manager for Tupelo Medical, was concerned about the variability in price paid for its top-selling product, the Micron 8 Series blood pressure monitoring system. Using historical transaction data, Davidson must determine the appropriate price floor. Setting a price too high risked the loss of a large number of customers, putting the company at substantial risk due to the importance of the product. Setting a price too low would impact Davidson's ability to meet the stated objective of increasing margins by 3 percent. He wondered what the optimal price floor would be and what the expected profits would be for that new price floor. Additionally, the company's business varied considerably by geographic region, account size and account type. As a result, he needed to consider whether it made sense to set a single price floor or whether he could improve profits by allowing some variability in the price floor by customer segment. Data supplement in case packet. Review the note: Tupelo Model.

Fueling Sales at EuroPet (Data set in the course packet)
EuroPet S.A. was a multinational company operating gas stations in many European countries. There was a growing propensity for supermarkets to attach gas stations to their retail operations, which was developing into a major threat to EuroPet. As a result, in the mid-1990s, the company began to develop and brand its own convenience stores co-located with its gas stations. However, the company was spending much more on advertising the convenience stores than its competitors did. Management now had to decide if the increase in sales attributed to advertising. Review: Ajaz's Note on Omitted Variable Bias.

Pedigree vs. Grit: Predicting Mutual Fund Manager Performance (Data set in the course packet)
An asset management company must replace the manager of its two signature mutual funds, who is about to retire. Two candidates have been short-listed. The management team is divided and cannot decide which of the two candidates would make the better mutual fund manager. The retiring manager presents a linear regression model to examine success factors of mutual fund managers. This linear regression is the starting point for the subsequent analysis. Review: Ajaz's Note on Omitted Variable Bias. Optional: Hedge Funds Performance and Personalities.

Copper and Zinc Markets – 1996, Bidding for Antamina, Real Options Monte Carlo Simulation
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:
(Real Options Monte Carlo simulation Excel model) 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. Must also read: Bidding for Antamina, Ajaz's Note on Brownian Motion, Introduction to Convenience Yields, Stochastic Convenience Yields and Pricing of Oil Contingent Claims. Optional readings: Brennan and Schwarz, "Evaluating Natural Resource Investments", Energy Price Processes, Asset Pricing and Commodities.

Race to Develop Human Insulin and R&D Race
Race to Develop Human Insulin:

Describes the race to develop human insulin.
R&D Race:
Two firms are engaged in a race to develop a new process. Various strategic aspects of the race are analyzed. Optional: Does AMD Spur Intel to Innovate More? *Journal of Political Economy*, December 2011 (JSTOR).

Ocean Carriers (Data set in the course packet)
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.

The Offshore Drilling Industry in 2011
After booming in 2007 and early 2008, the offshore drilling industry slumps in 2009. Lower oil prices lead oil companies to reduce drilling budgets, and rig utilization falls from essentially 100% to 70% in some markets. Day rates--the prices paid for a rig's services--fall by as much as 68%. The case illustrates how supply and demand work together to determine prices and utilization in the short run, as well as how long-run supply is determined in an industry where capacity additions take several years. Also describes how advances in deep-water drilling technology are changing industry structure.

Measuring Price Promotion Effects (Data set in the course packet)
One of the key problems in marketing decision making is how to measure the effectiveness of marketing actions, for example, the effect of temporary price promotions on sales. Many outcomes of marketing decisions are multiply determined and involve both short- and long-term effects that are hard to pin down. So marketing managers are often unable to specify the precise effects of what they are doing, and instead rely on intuitive estimates of the effects of their decision making or, worse, on commonsensical arguments to complement ill-conceived cost-plus pricing approaches. Scanner data-based records of customer purchase decisions provide a wealth of data that managers could use, but how can they get useful input for their decision making out of thousands and thousands of purchase transactions?