Data and Decisions (Statistics)

Main Course Takeaways

- **Making informed decisions under uncertainty.** Managers can attempt to reduce uncertainty in their decisions by making sensible inferences from analyses of historical data collected from primary and secondary sources. By using sound statistical methods in the collection and analysis of the data, and logic in its interpretation, managers can increase the likelihood of success in their firms' activities.
- **Thinking critically about data analysis and inference.** Managers must be able to avoid errors in data interpretation in order to keep the firm from making costly and avoidable mistakes. Problems in survey methodology (leading to bias and/or variability), lurking variables, reverse causality, and causation implied by association are all common pitfalls that are often overlooked by even the most experienced managers.
- **Interpreting summary numbers sensibly.** Regressions, confidence intervals, and hypothesis tests on data can help managers make generalizations in similar circumstances. The accuracy and specificity of these generalizations, about individual variables or proportions of them, can be ascertained with more certainty the larger the quantities of data analyzed.
- **Displaying data in useful and clear ways.** Appropriate use of visual displays of data, in the form of bar and pie charts, histograms, scatterplots, and stem-and-leaf and box plots can significantly enhance data interpretation.

<u>Skills/Frameworks</u>: **Students can expect to learn the following tools to assist in data analysis.**

- **Measures of central tendency**. Mean, median, and mode.
- **Measures of variability**. Variance and standard deviation.
- **Normal distributions**. Density distributions and bell curves.
- **Bivariate relationships.** Correlation, Least-Squares Regression, and R-squared.
- **Measurements.** Samples, reliability, and validity.
- St**atistical inference.** Population parameters, bias, variability, and sampling error.
- **Sampling distributions**. The law of large numbers, unbiased estimators, and the Central Limit Theorem.
- **Confidence intervals and hypothesis testing.** Estimates of ranges of data and null hypotheses, for means and proportions.
- **Simple and multiple regressions.** Determining the influence of variables on one another.

Economic Analysis for Business Decisions (Microeconomics)

<u>Main Course Takeaways</u>

- **Decision Theory.** There are many conceptual frameworks that can be used to make the decisions to allocate and expend firm resources easier. These frameworks involve identifying the different options available, the relative probabilities of chance events leading to those options (if applicable), and the payouts of each option. Firms typically choose those options with the highest payouts.
- **Value of information.** Information is only valuable if it may affect choices—think of this when determining whether to invest firm resources in activities that may reduce uncertainty. If the choice is obvious beforehand, the activities are valueless.
- **Costs.** When making managerial decisions, some costs should be factored into decision analysis and others should not. Managers must think of the opportunity cost of any action (the cost of the next best alternative)—in some cases this could be the largest cost of an action. Managers should not factor in sunk costs (expenditures that have already been incurred)—they are irrelevant to future action and can mislead decision makers hoping to recoup those expenses.
- **Marginal approach.** Firms should maximize profitable revenue by using marginal analysis to determine optimal production quantities and prices. So long as the firm's marginal revenue of a product is larger than its marginal cost, the firm is making money.
- **Market structure and competition.** Firms must be aware of the type of market in which they operate and of their competition. The market structure will help determine the appropriate pricing and supply considerations a firm must make, as well as how firms can anticipate and/or respond to competitive reactions from other firms. Firms can use game theory frameworks given their market type and competitors to facilitate decision making.

<u>Skills/Frameworks</u>: Students can expect to learn the following tools and concepts in this course:

- **Decision analysis.** Decision trees, expected values, perfect/imperfect information.
- **Costs.** Fixed vs. variable costs, long/short run, production functions, economies of scale.
- **Marginal analysis.** Diminishing returns, marginal cost, marginal product, marginal revenue.
- **Elasticity.** The relationship between demand and income/price/etc.
- **Pricing.** Price discrimination (market segmentation), two-part tariffs, bundling, versioning.
- **Market structures.** Monopoly, perfect competition, monopolistic competition, dominant/fringe, oligopoly, etc.
- **Game theory.** Tree form vs. normal form, one-shot vs. repeated, Prisoner's Dilemma, Nash equilibria, Bertrand (price) and Cournot (quantity) oligopolies.
- **Vertical relations and firm boundaries.** Make or buy decisions, arms-length transactions, upstream/downstream market power, double marginalization (successive markups), externalities, holdup.

Ethics and Responsible Business Leadership

Main Course Takeaways

- **Obeying the law alone in pursuit of profit is not enough to ensure ethical leadership.** Corporations and their employees still face the responsibility of making moral judgments to protect the social legitimacy of their businesses. Because the actions of corporations cause chain reactions that touch the outside world, it is important for leaders to be focused on the larger ramifications of their actions.

- **Frameworks can be employed that offer systematic approaches to ethical decision making.** Core values of greater good, rights, dignity, and justice can be effective guides to ethical decision making, based on millennia of thought, research, and practice.

- **Corporate cultures should reward ethical behavior.** Unethical behavior can kill corporations—free-riding, decision biases, and responsibility vacuums are all problems that beset organizations without structures in place to ensure that ethical behavior is the norm. Public opinion can be merciless in response to ethical crises at firms, affecting consumers and employees alike.

- **Leaders should be strongly vigilant against lapses in ethical judgment or behavior, even when small.** The reputations and brands of firms, built on years of good will and customer service, can be ruined through breaches of ethical integrity; minor transgressions can lead to major moral crisis, as smaller transgressions over time can snowball into larger problems. Leaders must be vigilant in creating a corporate culture than shuns unethical behavior, from the small to the large.

- **Act.** Research shows that most people fail to act in a given difficult situation because they assume others will. Resist this temptation. Don't assume that others will carry the burden of ethical behavior. Recognize and fight your own rationalizations of why you don't need to act.

Skills/Frameworks:

- **Utilitarianism & categorical imperative.** Utilitarian theory postulates the greater good for the greatest number, placing an emphasis on leaving the world better than we found it. Kant advocated for using universal laws to guide decision making. In other words, can any action be "universalized" for a given situation, and become part of an harmonious social whole? If so, the action is permissible. Leaders should consider both: the consequences of acts, as well as the principles leading to them.

- **Helpful tools.** There are several frameworks used by successful business leaders to put ethical decisions into context. Imagine that your decision will be publicized by an unfriendly yet accurate reporter—can you live with the action being public? Warren Buffet encourages his employees to “play down the middle,” which resonates with ancient Aristotelian wisdom of hitting the middle between extremes. The Rawlsian **Veil of ignorance** advices you to make decisions as if you did not know who you will be among those impacted by it. Would you feel you were treated fairly regardless of whose shoes you end up in?

Finance

Main Course Takeaways

- **Net present value**. Probably the most common method for determining the efficacy of an investment of firm resources in a project is the Net Present Value (NPV), in which cash flows for each year of the project are discounted back to the present (using an appropriate interest rate), then summed with the initial investment. If the total is positive, then the project is profitable for the company and should be pursued.
- **Alternative measures of value.** In addition to NPV, firms may use other methods to determine whether or not to invest in a project. The IRR (internal rate of return) is the project's discount rate that sets the NPV to zero—so long as the IRR is higher than the actual discount rate, the project should be pursued. The payback period (the number of years needed to recover investment in a project) is also used periodically, although it is not as robust as NPV or IRR.
- **Accounting adjustments.** When using financial statements to determine cash flows of a company, care must be taken to remove non-cash expenses and income typically presented in the statements. Also, initial capital investments in a project must be accounted for if depreciated over the course of the project, which will affect the tax rates in each year (which in turn affect cash flows).
- **Portfolio theory.** Diversification of a portfolio helps to minimize the riskiness of the investment. For any asset, its expected return will be driven by the extent to which it is exposed to market risk. Assets that are very exposed to market risk must have high expected returns to compensate investors for holding these risky assets.
- **Derivates.** In addition to regular financial assets such as stocks, bonds, and financial projects, the cash flows of derivates are derived from the cash flows of another asset or security.

Skills/Frameworks: **Students will learn the following skills and principles in the course.**

- **Discounting cash flows.** Determining the present values of a variety of different cash flows (perpetuity, annuity, growing perpetuity, growing annuity), along with ways to combine them.
- **Interest rates.** Calculating the Effective Annual Rate (EAR) and Annual Percentage Rate (APR).
- **Dividend/Coupon growth.** Calculating growth with the plowback ratio and return-on-equity.
- **Changes to accounting figures.** Calculating Net Working Capital and tax shields.
- **Portfolio theory.** Calculating the mean, variance, and standard deviation of a portfolio of assets. Calculation of the Sharpe ratio of an asset (the ratio of reward to risk).
- **CAPM.** Calculating an asset's return and beta (relationship with market return) using the Capital Asset Pricing Model, to be used as the discount rate for NPV calculations.
- **Other valuation models.** Calculating firm value with or without the debt tax shield, using betas and the Adjusted Present Value (APV) and Weighted Average Cost of Capital (WACC) methods.

Leadership Communications

Main Course Takeaways

- **Communicate with authenticity.** Leaders need to inspire others, create cooperation among those who work with them, and advocate for ideas and proposals both within and outside their organizations. Those leaders that speak authentically and persuasively will be more effective than those who do not.
- **Take risks to develop a unique and personal voice.** Effective speakers are those whose messages are memorable. Your messages will be better received if they are paired with an engaging, unique, and personal style of presentation. In most cases the speaker will not be separated from the message, so be sure that both the style and the substance are in sync.
- **Creativity in delivery is preferred, but not at the expense of structure.** As a speaker, your key goals are to have your message heard, understood, and believed. The structure of your presentations and speeches should reinforce message absorption and the easy and logical flow of your arguments. An audience hears a speech once, so structure it accordingly.
- **Effective feedback and coaching is a hallmark of good leadership.** In addition to public speeches and presentations, feedback and coaching are communications tools that leaders and managers use frequently. Leaders must be able to provide appropriate critical yet constructive feedback to those in their organizations to help those individuals and the organization improve.

Skills/Frameworks:

- **Know the audience and your issue.** Tailor your presentation accordingly to the specific audience at hand. Doing so will allow you enable you to get your points across more easily, as well as help you determine where likely pushback will be. Being an authority on the subject will increase your credibility, and will allow you to respond effectively to questions.
- **Three-part structure.** Be sure to introduce your topic before the main part of the speech, and summarize it again at the end. In other words, tell them what you are going to tell them, tell them, and then tell them what you told them.
- **Be conscious of your body and your delivery.** Good posture, movement, and distance from the audience can influence how you and your message are perceived. Filming yourself is a great way to determine how you come across in delivery, in order to identify weak points. Also, people tend to speak rapidly when giving public presentations, which can be very distracting to an audience. Slow down so that your audience can hear and absorb your message.
- **Metaphors/Images.** Colorful language evoking memorable imagery is an effective tool for strengthening your message.
- **The Slam.** After your speech is concluded, and you are engaging in Q&A, remember to "slam" your point home one last time after the last question to nicely sum up your time before the audience. In this way you regain control of the presentation, which you cede somewhat during the Q&A.

Financial Accounting

Main Course Takeaways

- **Financial statements.** Made up of several schedules, a firm's financial statements summarize the economic consequences of its business activities: 1) The **balance sheet** shows the assets of the firm and how they are financed; 2) the **income statement** shows revenue and expenses for over the period; 3) the statement of **stockholder equity** reports changes in shareholder equity and retained earnings over the period; 4) the **cash flow statement** reports total cash inflows and outflows for the period; and 5) the **notes** describe the details of the line items and disclose items not listed in the four schedules.
- **Double-entry accounting.** Every accounting transaction must balance between debits and credits. These debits and credits are split between the appropriate parts of the Accounting Equation: Assets = Liabilities + Stockholder's Equity.
- **Financial analysis.** It is possible to analyze the financial data contained within the financial statements to evaluate past and current performance of the firm, and to forecast the firm's future cash flows. This is done through ratio analysis, which primarily describes the firm's ability to generate cash flows from its assets (return on assets) and from the funds invested by shareholders (return on equity).
- **Accounting analysis.** Sometimes firms attempt to show better financial performance through a variety of means (most of which are legal): moving items off of the financial statement schedules, recognizing revenue or expenses in different periods, changing costing methods, etc. Before a financial analysis is begun, an accounting analysis must be performed to evaluate the degree to which the firm's accounting captures its underlying business reality.

Skills/Frameworks: Students will learn the following principles and concepts in this course.

- **Construction of financial statements.** Double-entry accounting methods (debits and credits, journal entries and T-accounts), flows to balance sheet, income statement, and statement of stockholder equity; reconciliation of cash transactions to cash flow statement.
- **Ratio analysis.** Calculation and disaggregation of both return on assets (ROA) and return on equity (ROE). ROE is split into operating and non-operating components to separate the return of the core activities of the firm from that of its investing and finance activities.
- **Operating income.** Reversal of common distortions such as the "Big Bath" (recognizing large costs in a period already depressed), recurring charges couched as non-recurring (extraordinary items, restructuring costs, etc.), or improper revenue recognition.
- **Operating assets.** Computation of cost of goods sold (COGS) and different methods (LIFO, FIFO, etc.), aging accounts receivable, capitalization of assets and depreciation rates, etc.
- **Inter-corporate investments.** Non-controlling financial interest (minority passive, minority active) and controlling financial interest (majority) and accounting methods for each (trading securities, available for sale, equity method, full consolidation, etc.).

Leadership in Organizations

Main Course Takeaways

- **Leading by leveraging resources.** Leadership can be exercised independent of structural position and formal authority. Interpersonal influence tactics are key tools in effective leadership. Personal and professional networks are resources available to anyone.
- **Leading oneself.** Every individual leader has a dominant style, but the most effective leaders understand that certain situations and individuals require, or respond best to, different leadership styles. The most effective style depends on the characteristics of the task, the people involved, and the situation to be managed; there is no "best" way to lead.
- **Leading through culture.** Leaders need to create an organizational culture in which people are encouraged and empowered to do their very best, through the leaders' own demonstrated actions and through adequate selection, socialization, and rewards programs. A culture of innovation can be built by encouraging creativity and removing barriers to idea implementation.
- **Leading change.** The one constant in organizations is change. To lead change effectively, leaders must understand the key constituencies within and outside their organizations and how to shepherd them through the distinct stages of successful change.

Skills/Frameworks:

- **Sources of power.** Power emanating from relationships or skills (referent, reward, and expert) is much more effective than that deriving from one's position (legitimate, coercive). One need not be a supervisor to be a leader.
- **Networks.** The most effective networks are those with a good balance of redundant and non-redundant ties. A leader's position is generally enhanced if he or she acts as a broker between unconnected network nodes. Develop a diverse portfolio of social contacts.
- **Six basic leadership styles.** The following leadership styles should be used in combination to achieve desired results: coercive, authoritative, affiliative, democratic, pacesetting, and coaching. It is rarely a good idea to use one exclusively.
- **Cultural cues.** A leader can change or influence organizational culture through subtle or overt cues: Where do you spend your time? What questions do you frequently ask? What is important enough to call a meeting about? What gets on the agenda? What is celebrated?
- **Innovation.** The best way to move towards a culture of innovation is to create a sense of urgency within the organization. Urgency implies rapid implementation, which empowers employees to act independently.
- **Driving change.** Focus your change efforts on those stakeholders (innovators, early adopters, and the "early majority") who will be able to bring late adopters and resistors along through inertia and influence. Use appropriate public and private influence tactics to secure support depending on the particular individual and situation.

Macroeconomics in the Global Economy

Main Course Takeaways

- Understanding how and why interest, inflation, unemployment, and foreign exchange rates go up and down.
- Learning how to translate those lessons into better understanding of past and current events and into better forecasts of future events.
- Understanding how consumer and business practices affect and are affected by, the current condition and outlook for the future of the U.S. and other economies.
- Learning how to analyze how governments' monetary, fiscal, and trade policies affect, and are affected by, macroeconomics.
- Perspectives on the recent financial crisis and its effects on economic recovery.

Skills/Frameworks:

- Building and using the tools and approach of demand and supply to help understand which real and financial goods and services are produced, bought and sold in a macroeconomy, at what prices and in what volumes.
- Using past events and current predicaments to understand how macroeconomies operate and how they influence business and public policies, and vice versa.
- Assessing the roles of consumers, businesses, governments, and the international trade in the health of economies.
- Appreciating how and when tax and monetary policies affect consumers and businesses.
- Using multiplier analysis to understand the ripple effects of changes in spending.
- Building conceptual models that account for the simultaneous setting of interest rate and unemployment.
- Understanding international trade and capital flows, the "balance of payments", and exchange rates.

Marketing Management

<u>Main Course Takeaways</u>: **The course outlines a multi-step process to ensure marketing success.**

- **Situational analysis.** Before a marketing strategy can be designed and implemented, a firm must take stock of the competitive landscape, as well as of its own internal strengths and weaknesses. The firm must understand who its customers are, and who it wants them to be.
- **Set objectives.** After the situational analysis, the firm can determine its core business objectives, out of which its marketing strategy and tactics will flow. The firm's basic choices for its objectives are: 1) Increase profits; 2) Increase market share. These are essentially short vs. long-term goals and must be weighed carefully.
- **Core strategy.** At this point the firm must choose its customers and it competitors for the product in question. Who are the competitors based on the customer targets, and how will the firm position itself relative to others? Central to this issue is the value proposition that a firm will create for consumers.
- **Programs and tactics.** At this point the firm must determine the 4 Ps: the details of the product, its price, where and how it will be distributed (its place), and how it will be promoted. It is in the application of these tactics that the rest of a product's value chain is involved.
- **Evaluation.** Through firm financial data and market research data the success of the marketing strategy and campaign can be ascertained. At this point the effectiveness of the competitive responses of other firms can be determined in order to change tactics. It is dangerous to repeatedly change strategies as it may dilute the perceived value of the product's brand.

<u>Skills/Frameworks</u>:

- **Growth strategies.** There are four main strategies for firm growth: 1) market penetration (old product, old market); 2) market development (old product, new market); 3) product development (new product, old market); 4) diversification (new product, new market). Firms must be keenly aware of their capabilities, those of their competitors, and the likely consumer response for each of these strategies.
- **Market segmentation.** Segments are statements about *consumers*. Who are they? How do they buy? What are their sensitivities to the marketing mix? Focus on those elements you can change (benefits) over those you can't (demographics).
- **Value proposition.** The value to the consumer is their benefit minus the product price. Be sure you have a clear statement of who your target consumers are and how your product's benefits will determine that they will buy from you and not your competitor.
- **Product life cycle.** There are five main stages in the product life cycle: 1) introduction; 2) early growth; 3) late growth; 4) maturity; and 5) decline. In each stage, the strategic options vary depending on the competitive position of the firm (leader/follower). Be mindful of what the main competitor is doing. In some cases, being a distant second might be the smart choice.

Operations Management

<u>Main Course Takeaways</u>

- **System performance is determined by the limiting resource (system capacity is the bottleneck capacity).** In a production or service process, the system can only perform at the rate of the slowest resource within the process. It is vitally important to identify the system bottleneck, as changes to other parts of the process will not improve performance.

- **Process choices should be integrated, consistent, and self-reinforcing.** Different types of production or service processes (line, batch, and job shop) are warranted depending on the degree of specialization necessary to deliver the end product. Firms should be wary about "cherry picking" elements of successful operational models without considering the full set of the process choices that compose those models and how those choices interact.

- **Uncertainty and variability are painful…** Uncertainty and variability in demand can wreak havoc for production processes. Excess demand can strain such processes beyond their limits, reducing productivity; limited demand can be extremely costly as expensive capacity and materials are sitting idle.

- **…But proper actions mitigate this pain.** Firms can take many steps to prepare for unforeseen changes in demand. In addition to adequate production processes, through effective supply chain management supplies can be ordered to minimize the setup and inventory costs; through effective demand estimation the proper quantity of goods can be produced in advance to minimize potential losses.

<u>Skills/Frameworks</u>: Students learn the following tools/techniques to optimize system performance.

- **Process analysis: Little's Law.** The amount of inventory in a system is related to how quickly work is performed and how long inventory spends in the entire system.

- **Queueing models.** The amount of time a unit spends in line before processing (e.g., how long a customer waits before service begins) is a function of the time needed to complete the processing, the utilization of that step of the process, and the variabilities in the arrival time and the processing time.

- **Optimizing the production process.** Several Japanese production principles can be used to increase system efficiency: **Jidoka** (making problems self-evident); **Kaizen** (continuous improvement); **Heijunka** (mixed model production); **Kanban** (pull-oriented production).

- **Economic Order Quantity model (EOQ).** This model recommends the optimum quantity of inventory to be ordered for a production process, balancing the cost of the inventory orders with the cost of holding the inventory.

- **Optimum production quantity: Newsvendor model.** This model uses a “critical fractile ratio” (derived from marginal analysis) to determine the optimum quantity of a good to produce to minimize potential losses, in light of predicted demand. When adjusting supply is impossible (airlines, hotels, etc.), this same approach can be used to adjust the demand, helping to determine how many higher-priced products to reserve.

Organizational Behavior

Main Course Takeaways

- **The most effective organizations are those in which individual skills and motivations are aligned with the overall organizational culture.** The better an employee fits with the organization's culture, the lesser the likelihood of low morale, diminished productivity, or turnover, all of which are incredibly costly to the organization.
- **Managers cannot and should not rely on formal authority alone in order to achieve their goals.** Managers must build relationships within their organizations and adjust their management styles accordingly depending on the situation and/or individuals involved.
- **A company's work processes must be aligned with its overall business strategy.** For example, if superior customer service is a key strategy for driving consumer loyalty, employees must be empowered to deliver on that promise as needed. These work processes should be reevaluated regularly in order to adjust for changing strategies.
- **Effective team selection and management is a key ingredient of organizational success.** Team leaders must have enough credibility within an organization to gain cooperation and buy-in from relevant parts of the firm; they must also populate the team with those people with requisite skills and experience, and with those whose work will be affected by the team's decisions.
- **Firms must be sensitive to differences in work styles and communications when engaging in international partnerships.** These types of arrangements must not be rushed—to ensure success firms must take the time up front to build relationships, to set expectations, and to understand how their partners work.

Skills/Frameworks:

- **Be direct and open.** Poor managers are passive and compliant—a good manager actively solves problems by calling attention to them and aligning resources to prevent them from reoccurring. Create a culture that encourages feedback which allows others to do the same.
- **Wielding influence.** Influence can be exerted in many different ways: rational persuasion; inspirational appeal; consultation; ingratiation; exchange; or coalition building. Understand which methods work with different individuals and plan your approach accordingly.
- **Team formation/management.** Spend time up front clarifying the purpose and objective of the team, as well as the roles of the individual members. Discussing the process and deciding upon rules early will lead a more integrative solution with more satisfied participants..
- **International business.** Allow more time for working across cultures, including the time necessary to build a relationship in advance of the deal. Be alert to differences in communication styles, as well as of the stereotypes others may hold of your culture.

Strategy

Main Course Takeaways

- **Competitive advantage.** The main questions corporate strategists attempt to answer are 1) how does the firm develop a competitive advantage; and 2) how is that advantaged sustained? These questions can be answered by looking at a number of different factors of both the firm and its competitors.
- **Profitability.** There are two essential determinants that drive the profitability of a firm: 1) the competitive position of the firm relative to others in its market; and 2) the attractiveness of the firm's industry as a whole. Firm leaders must identify these factors in order to make informed entry and exit decisions.
- **Decisions matter.** Research shows that roughly 40% of firm profits cannot be explained by industry or the position of a firm within it. Therefore, a significant portion of a firm's success comes from the competitive actions and responses a firm makes relative to the other players in a market.
- **Major routes to success.** The two most significant ways a firm can build competitive advantage are 1) low cost production and 2) differentiation. The most powerful strategies integrate these two factors seamlessly, making their duplication by competitors extremely difficult.

Skills/Frameworks:

- **Industry analysis.** Several frameworks exist to identify the attractiveness of an industry. **Porter's Five Forces** (threat of new entry, bargaining power of suppliers, rivalry amongst existing competitors, threat of substitutes, and bargaining power of customers) shows how the firm could fit within an industry; the **Value Net** (firm, customers, competitors, suppliers, and complementors) identifies the interplay between market players based on value creation.
- **Value creation and division.** A firm achieves competitive advantage in a market by increasing the overall value in a market (through its entry), then appropriating a larger share of that value than its competitors.
- **Threats to sustaining competitive advantage.** Firms must be vigilant to competitors' attempts to reduce their competitive advantage. This is most often done through: 1) imitation; 2) substitution; 3) slack; and 4) hold-up. Firms can combat these attempts by building barriers such as patents, contracts with suppliers and retailers, increasing economies of scale, and media and regulatory pressures, among others.
- **Competitor analysis.** Determining the likely moves a competitor will make is a key strategic objective to guide a firm's own decisions. By identifying a competitor's current strategy, likely future goals, industry assumptions, and its strengths, a firm can develop a response scenario to allow it to outflank the competition's anticipated moves.