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Application Portfolio

Background

Over the semester you will be developing a personal “application portfolio”. This will be a suite of applications of real options methods to a professional issue of your own choosing. You will build it up through a series of exercises that will substitute for many of the problem sets that ordinarily accompany an analytic course.

Examples of application portfolios done in previous year are posted on the course web site, at http://ardent.mit.edu/real_options/Common_course_materials/applications.html . These provide you with a concrete idea of where you will be taking this effort.

The object of developing this “application portfolio” is to provide you with a worked-out application of real options analysis in an area of interest to you. The expectation is that, by creating this portfolio, you will achieve an in-depth understanding of how real options analysis could be useful to you professionally.

This “application portfolio” might also provide you with a good start on some research project or thesis, or be a helpful complement to work you were doing – that would be an added benefit. In general, you are encouraged to develop this “application portfolio” around some research or course project that you might be involved with.

Development of Portfolio

To develop the portfolio, you undertake a set of application portfolio assignments. Towards the end of the semester, you will assemble them, edit them based on what you have learned over the course, and combine them into a whole. Our hope is that you will be proud of this tangible take-away from the course.

The instructors will review each application portfolio assignment and return yours to you with comments and suggestions. You should use these to revise your work so that, by the end of the course, you have a completed portfolio that represents the best that you can do (within the time available).

Put another way, the collection of assignments that constitute the portfolio is a living document. It is more than a collection of the assignments you turned in. It should be a “finished product” that brings together your revisions of the original assignments, based on what you learn from the feedback from the instructors and the rest of the course.

To facilitate the development of the “application portfolio”, each of the assignments is conceived of as the basis for a separate chapter in the portfolio.

Assignment 1: Describe your Engineering System

Describe the engineering system that you would like to analyze this semester. Choose something that:

- interests you and that you wish to explore, as you will spend substantial time on it;
- has ready sources of information, as you will have to assemble data soon;
- you know something about – in particular you should have access to some quantitative model of the system. This model may be crude. For the class purposes, the important thing is that you have a basis for going through relevant kinds of calculations.

You should place yourself in the position of someone participating in the design of this system. For example, you might want put yourself in the role of a system designer for a power plant or a series of power plants.

The system you choose should also have a long-life relative to the cycle time of change in the field – for example, this might be 5 year for a computer chip, or 50 years for hydroelectric dams. The reason is that you should allow time for learning about the evolution of the system to take place. This learning is an essential part of managing the evolution of the design of the system to provide maximum value.

The system might be entirely physical (an electronic chip, or a machine), largely conceptual (a supply-chain), or somewhere in between. In any case it should be a “system” in that it is complex. It will also exist in some kind of environment that will affect its design or use over time. Examples of the factors that could affect the optimal design and evolution of the system include the:

- Economic situation (boom, bust, cost of money)
- Rationale for the system (what is its purpose)
- Evolving nature of the competition market (new companies, mergers, bankruptcies)
- Regulatory or political environment (concerning the environment for example),
- Technological change (information systems and the like),
- Etc...

In selecting your system, restrain your ambitions. Do not choose something that is especially complex. As you go through the semester, you will have to calculate the performance of your system in many different configurations, and you do not want to be lost in seemingly endless calculations. Keep in mind that you are doing a class project, not completing a Master’s thesis. For example, if you were interested in electricity production, do not focus on the whole production and use of electricity!

Be sure to describe the following:

- What is the system? What does it include, and what does it exclude?
- What are its principal design levers or variables? What can we manipulate to improve its performance? What kind of model do we have to analyze the effect of these variables?
- What are the benefits of this system? What models do we have of how the design affects these variables?
- What are the main contextual factors that will affect the value of its performance? (For example, new market or regulatory demands might be crucial.)

Be Brief – Maximum 3 pages. The idea is to show that you have a workable topic.

Instructions for submitting the application portfolio assignments

Write the assignment in **Word** – so we can provide feedback in “track changes” mode

Also, use headers and or footers on text to provide your name, the topic, and page number

(Points off if you complicate our lives unnecessarily by failing to follow this format)