Briefly the Convention Center Project in South Boston was discussed at the beginning of the class. Essentially, over the years a number of different cost estimates were given for proposed hotel space in South Boston, featured in a number of different local papers. The students were directed to read the Real Estate section of any city newspaper and analyze projects using the available information as an exercise.

With the methodologies and techniques being taught in this class, it is possible to have an informed opinion of ongoing local projects simply by using estimated numbers available from public sources.

The articles cited were:

How not to do Sensitivity Analyses

You can create a table like this, changing every possible variable in the project by 10% or 20% and finding out what its impact on the evaluation criteria (NPV or IRR) is. By doing this, you end up with a two-inch thick report that has much detail but little thought.

When doing sensitivity analyses, it is important to think about whether the variable would really change that much. If the project size is constrained by engineering issues, then maybe you can’t make the building 20% taller because it would simply collapse in the soft Boston blue clay. If the project is buying a car, then maybe you can’t make a car last 30 years no matter how well you maintain it. If you have a pretty good cost estimate, maybe you can’t make the costs 20% less – although it could always be 20% more, if you have a good project management team, that should not happen. On the other hand, if your cost model is no more than an experience-based SWAG, then it could grow by 50% easily, especially if there are major engineering constraints that you had overlooked.

Thus, when doing a sensitivity analysis, you should aim to change each variable by a range that is reasonable for that variable. For instance, if the current interest rate is 8%, you might expect it to go to 6% or 10%, but probably not 0% or 20%. (However, but in Japan, interest rate is currently close to 0%!) Thus, choosing reasonable ranges for sensitivity analyses requires some thought.
Thoughtful Sensitivity Analyses

Sometimes the range of variable that you should analyze depends on the circumstances. For instance, if you are looking at a project that relies on financing five years out, the interest rate could be 6%~10%. So you should look at all those possibilities. If you’re in the middle of negotiations on a large loan, and you can see if you could get a slightly better deal by waiting a few months or using a different bank, perhaps 7.6%~8.4% is appropriate. If you’re going to sign a fixed-rate mortgage agreement tomorrow, the interest rate probably won’t change all that much.

The oil and electricity markets depend mostly on supply of crude oil, and energy prices are far from stable. The heating oil prices has fluctuated with at least a threefold range in the past ten years, so the 13.2¢ to 14.8¢ per kWh range is probably inappropriate unless you have a long-term contract to provide generation capacity as well as actually generating energy for the spot market. The 8¢ to 20¢ is a reasonable range to analyze, but the extreme ends are probably an ‘energy crisis’ scenario rather than a normal scenario.

Scenario Analysis

Some variables are dependent on each other. For instance, in an energy crisis scenario, if your electricity generating plant depends heavily on downtown business districts consuming a large amount of power for heating, if the energy crisis causes economy to go slow, the power consumptions could also decrease because the downtown offices are left empty (albeit those that are occupied would consume electricity and pay higher prices for it). Thus it is important to consider how the variables would affect each other in a scenario. (See lecture handout.)