**ECON 136: Week 11, Wednesday**

**Intertemporal Cost-Benefit Analysis**

The Stoltzfuss family is selling 100 acres of pristine woodland that has informally been available to local residents for hiking and bird watching for generations. What is the value of the land? Before we debate that, let’s calculate the perceived value of several scenarios.

1) Rap Pacious is considering turning the land into the Frisky Acres housing development. Under local zoning and land use ordinances she could turn the property into 45 residential lots. It would cost her $400,000 in year 1 to install the required infrastructure (roads and utilities). She expects to sell 5 lots per year starting in year 2 for $20,000 each and pay property tax of $1000 each year for each unsold lot residential. Rap uses a discount rate (8%) adjusted for the risk that lots won’t sell as well as she expects. What’s the present value of the Stolzfuss property to Rap Pacious?

2) In response to Rap Pacious’s proposal, a group of citizens have asked the supervisors of West Hicksville Township to consider purchasing the land to preserve it as pristine woodland for the benefit of the community. The township planning department uses the following elements to calculate the value to the community. It estimates total use, option and nonuse value of the land in its current state of $2000 each year. Residential housing units in West Hicksville send an average of 0.8 children to school. Hence, the planning department estimates that Frisky Acres would raise total property taxes by a total of $120,000 starting in year 11. Of course, should the Township purchase the property, it would lose the $8000 it currently collects in property tax from the Stoltzfuss family. West Hicksville uses the interest rate on municipal bonds (4%) as its discount rate for evaluating investments. What is the present value to West Hicksville Township of maintaining the pristine woodland and avoiding the increase in property taxes?

3) Chromium has been discovered under the Stoltzfuss land. Geo-engineers for Cleen Extractors, Inc. estimate that, after an expenditure of $500,000 in year one to set up the open-pit operation, chromium mining would yield revenues net of operating costs of $200,000 in years 2 through 12 (including a $20,000 property tax levied on active mines). Assume that (currently non-existent) federal regulations require that the site be sealed against run-off when the mine is closed in year 13 at a cost of $50,000. Cleen Extractors will have to pay property taxes of $8000 starting in year 13 until it can find a buyer for the property, which it does not anticipate being able to do. Cleen Extractors uses a discount rate (12%) adjusted for the risk that it will face even stronger environmental regulations while operating.

4) In response to Cleen Extractors plans, a different group of citizens ask the supervisors to consider buying the property to preserve the woodland and avoid the disamenities of the mining operation. The planning commission estimates those disamenities at $60,000 during year 1 (while the open pit is being created out of the woodland); $40,000 during each year the mine is in operation; and $5,000 annually for putting up with the sealed and minimally restored site. As in scenario (2), purchasing the property would deprive the Township of the property tax revenue; and the discount rate used is 4%.