

TGD
HW #3 Economics (please submit individually)

Due October 22, 2007, by end of day

1) [50 points] You are an entrepreneur setting up a kiosk for rural ICT needs. You have two designs and business models to choose from (A and B), which have net cash flows as below (assume this includes any salary costs of the kiosk operator):

Year	Project A	Project B
0	-15,000	-18,000
1	1,000	7,000
2	3,000	6,000
3	4,000	5,000
4	5,500	3,000
5	7,000	1,000

Assume these are net cash flows, and inflation is not an issue (i.e., nominal numbers are fine). Also assume risks are equivalent between the project (perhaps mitigated through insurance and other means). The license is only given for 5 years, so assume that is the life of the project, with no residual value.

Project A is a kiosk that expects increasing cash flows as users adopt this technology/service. *The growth is not due to inflation.* Project B is one where the kiosk can provide voice only, but focuses on long-distance, which has high margins today. However, as the government is rationalizing long-distance tariffs, the earnings from this decline over time.

Which is the better project? Does it appear worthwhile? Does your answer change if you have a soft loan available at 5% (i.e., a loan that is below typical market rates)?

MAX ½ Page text, single-spaced (*excluding* tables/figures/calculations – You must show your work/assumptions.)

2) [25 points] Water – it's something we all need, but often is unavailable, especially of high quality/cleanliness. A group has invented the Lifestraw (<http://www.lifestraw.com/>), which aims to provide a year's worth of drinking water for only a few dollars cost. Such personal water filtration still requires access to water itself, e.g, from a stream. In a few places, there is water supply (tap water) but the quality may not be good, so residents must either boil water, or filter it themselves. At the other end of the spectrum, e.g., Pittsburgh, tap water is drinking quality. Looking at these three options, Lifestraw, tap water, and filtering your own water using a filter, come up with the annual costs for a household of 4, and a metric of cost per liter (or gallon) of water. How are the solutions comparable (or not)? What, if anything, is missing from such a solution? [this Q involves some basic looking up online, and making order of magnitude calculations]

MAX 500 words, excluding any charts/tables/references

3) [25 points] A group of miners has banded together to form a cooperative to increase their bargaining power with the markets. They aim to use ICT to help discover the price of gold in the market, while previously they had to sell their production at a price set by a middleman trader. Gold prices are rather volatile, and are at \$18/gm (gram) today. They have the ability to store gold production for a brief period, so aim to learn more about price variations on a monthly basis. This country suffers from high inflation, so the *monthly* cost of capital is 5% (all numbers are nominal here).

They have \$100,000 to invest in a new mine, and they expect to produce 2.2 kg of gold in the first month, and 3 kg in the second month. However, the price is expected to be either \$19/gm (50% chance) or 25\$/gm (50% chance) [same over both the months, but either high or low]. This variance is based on whether certain foreign sale transactions are allowed by the government, for which they require ICT to learn the state of the market. What is the expected value for the mine investment? Assume the ICT systems are already available (at no extra cost). Should they invest in the mine?

Max ½ page, single-spaced, *excluding* tables/charts/calculations.