

ECONOMICS 1A: PROBLEM SET 3

Opportunity Costs

1. You commute to San Francisco for work purposes. The distance is 75 miles. You can drive or take the train. The train ticket is \$25, and the journey takes 2 hours. Your wage is \$20 per hour. The cost of the car journey is \$10 for gasoline, \$4 for tolls, plus a depreciation cost of \$0.20 per mile for your vehicle. The car journey takes 1.5 hours.

- (a) What is the opportunity cost in \$ of getting to the city under each mode (compared to not going)?
- (b) Which policy would be more effective at getting people to take the train – a 20% gas tax, or speeding up the train by 30 minutes?
- (c) Free wireless was just introduced on the train. How might this affect the relative opportunity costs?

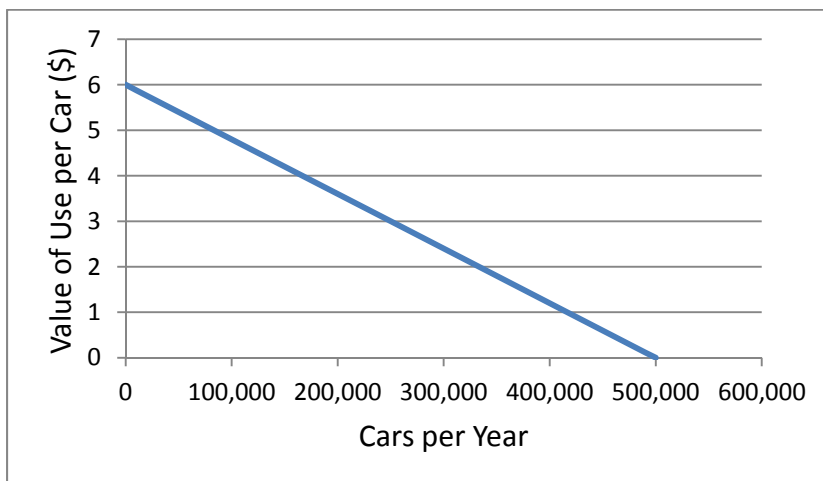
2. The table below shows the wages of high school graduates at different ages, the tuition cost of college, and the annual living expenses at each age which depends on gender and number of dependents.

Age	Gender	Number of dependents	Tuition cost	Living expenses	Wage of high school graduate
20-24	Male	0	\$9,000	\$16,000	\$24,000
20-24	Male	2	\$9,000	\$24,000	\$24,000
20-24	Female	0	\$9,000	\$15,000	\$20,000
20-24	Female	2	\$9,000	\$20,000	\$20,000
40-44	Male	0	\$9,000	\$30,000	\$40,000
40-44	Male	2	\$9,000	\$40,000	\$40,000
40-44	Female	0	\$9,000	\$25,000	\$32,000
40-44	Female	2	\$9,000	\$32,000	\$32,000

- (a) What is the opportunity cost of college in \$ for a 20-24 year old male with no dependents?
- (b) Does the cost of college increase if the 20-24 year old has dependents? Explain.
- (c) 40-44 year old males earn more than 20-24 year old males. Does that make college more expensive for them?
- (d) Given the opportunity cost for males versus females, if the economic benefits of college were the same would you expect more women or more men to attend?
- (e) Many Division 1 college athletes, even though on full scholarship, leave college before completing their degrees. Explain this in terms of opportunity costs.
- (f) Explain in terms of opportunity costs why private colleges and universities do not suffer much income loss in times of unemployment.

Marginal Costs and Efficiency

3. The new toll bridge to Hades over the river Styx cost \$10 m. to build, with an annual interest cost on the money of \$0.5 m, and costs a further \$0.5 m to maintain per year (irrespective of usage). It can carry up to 1,000 cars per hour. Suppose that maximum traffic demand, at zero toll cost, is 500 cars per hour. Suppose annual total demand for the bridge is as portrayed in the figure.



- (a) Assuming the operator can charge only one toll, can the bridge cover its annual costs?
- (b) Is it efficient to build the bridge? Explain.
- (c) What is the efficient toll?
- (d) Since operation of the bridge requires a subsidy from the public, what assumption does you answer in (b) make about the costs of raising tax revenue?