Applied Assignment 1, ECON 5313, Darren Grant, Spring 2004.

We will go over this in class and I will also collect a copy from each group to review. So please bring two copies to class, one to go over, and one for your group to turn in. The car your group chooses can be a group member's or just chosen at random. Groups are self-selected and cannot have more than four people. Have fun!

In this problem we will estimate the economic costs of driving for your car (if possible). The Web site **edmunds.com** contains a section that gives values for used cars that aren't too rare or too old. (It takes a little hunting to find it.) Pick a car: yours, a friend's, whatever. It must meet three criteria: 1) it's on the used car section of the Web site, 2) it must not be the first year of the model, and 3) the same model, one year older, must also be on the used car section of the Web site. We will consider the following costs of driving: gas, maintenance, depreciation, insurance, and interest.

At the top of your sheet, put *all* of the following: your annual insurance cost, annual mileage, gas mileage, typical annual maintenance costs for a car your age and type, the current price of the gas that you put in your car, the replacement value of your car (retail, what it would take for you to buy an equivalent car), the value of the same car one year older with the same mileage, and the value of the same car one year older with an additional year's mileage. These last three come from the web site–you'll have to use the used car vehicle appraiser.

Then do the following. Turn in your computations and results, in typed form, with copies of the appraisals (there are three appraisals): computations in front, appraisals in back, all stapled together.

a) Calculate the per mile cost of gas.

b) Calculate the per mile maintenance cost.

c) Calculate the average cost per mile of insurance.

d) Calculate the "opportunity cost of capital," that is, the interest paid on the money you borrowed to buy the car, or the interest foregone on the money you have invested in your car, for one year. You might find an interest rate on the web site or you can make up your own (reasonable) interest rate.

e) Calculate the average interest cost per mile.

f) Calculate *total* depreciation on the car as the difference between the retail value of the car and the value of the same car one year older with an extra year's mileage.

g) Calculate *age* depreciation as the difference between the value of the car and the value of the same car one year older with the same mileage.

h) Calculate *use* depreciation as the difference between total depreciation and age depreciation.

i) Calculate the *average* depreciation cost per mile.

j) Calculate the *marginal* depreciation cost–the amount the car depreciates for each mile it is driven.

k) Classify each of the following costs as either fixed or variable: gas, maintenance, insurance, interest, age depreciation, and use depreciation.

l) Calculate the average costs of driving the car, per mile. Use (some of) your results in a)-k).

m) Calculate the marginal costs of driving the car, per mile. Use (some of) your results in a)-k).

n) The State of Texas reimburses mileage for private cars driven on state business at the rate of 34¢ per mile. If no one else needed to use your car, and you needed to travel on state business, should you drive your own car or take a state car of the same level of quality, safety, and comfort? What about if the reimbursement rate was 20¢ per mile?

o) An analog here to "increasing output with existing capacity" would be driving faster. We know that the law of diminishing returns applies whenever a firm tries to increase output by using more of a variable input with its existing capacity. What is the law of diminishing returns? In the current situation, what is the fixed factor? The variable input? The output? How does driving faster exhibit diminishing returns?

p) The "flat of the curve" is an instance of diminishing returns. Draw a graph illustrating the relationship between the output and the variable input in part o), and identify the flat of the curve. If a driver is on the "flat of the curve," what does that mean in lay terms?

Applied Assignment 2, Darren Grant, ECON 5313, Spring 2004.

In this assignment you will learn about government regulation of dentists and will analyze market structure and firm conduct the markets for dental services in two rural Texas counties. As before, this assignment is done in self-selected groups of maximum size four. Turn in one copy to me and keep a copy to discuss in class. Your write up should include printouts of the license and TDA information on your ten dentists.

You will rely on two primary internet resources to conduct your research. The first is the Texas Dental Association: www.tdapublic.org. The second is the Texas State Board of Dental Examiners: www.tsbde.state.tx.us. The second one rarely goes down and the first almost never!!

1. Choose two rural Texas counties that you will analyze in this assignment. Go to the Texas Dental Assocation website, where you can create a list of all TDA members in each county (you figure out how, it's not too hard). Print out the full list of TDA dentists in your county. One county should have been fifteen and thirty dentists; the other between five and ten.

You must get approval of your counties from me to prohibit duplication of counties. I'm not worried you are going to cheat, I just want to make sure we have a large number of counties represented when we discuss this assignment in class.

2. Choose five dentists from each county and print out the TDA information on each. Then, for the same dentists, look up their licensing information on the website of the Texas State Board of Dental Examiners (if available), and print that out. Then call each of these dentists and find out how much they charge for a cleaning (prophylaxis) and, separately if possible, for a full set of X-rays. In some cases dentists "bundle" services and won't price items separately, or they will sometimes charge more for a first appointment, etc. In this situations, use your judgement and do the best you can.

3. Determine the degree of competitiveness of your two markets. Assume each dentist sees the same number of patients; however, some dentists practice together, so some dental "firms" have larger market shares. To determine whether dentists practice together, check their addresses and phone numbers in the TDA and TSBDE websites, or ask them when you call. (Do this for all dentists in your county, not just the five chosen above.) Then, calculate the four firm concentration ratio for your markets and, if you are ambitious, the Herfindahl index as well. For example, if a county has six dentists, two of whom practice together, then there are five dental firms, one with 33% (assumed) market share and the other four with 17% (roughly) market shares. So the four firm concentration ratio would be 83% or so and the Herfindahl would be about 2250. Concentration ratios and Herfindahl indexes are discussed in the Folland book.

4. Next look for evidence of product heterogeneity. In what ways (that you can observe) are the dentists in your county distinct from one another? Look for differences in anaesthesia permits; in experience, age, or sex; or in the type of dentistry they practice.

5. Write a summary assessment of the markets in your two counties. Use two nice, well-formatted tables. The first will list the following for each county: population, the total number of dentists listed by the TDA website, the dentist/population ratio (the number of dentists per 1,000 people), and per capita income. The second will give the prices from step 2. (The population and income numbers are out there, with a little looking you will find them. Your numbers should be no older than 1999.)

Then discuss market structure: product heterogeneity and market competitiveness. Conclude whether you feel your markets are highly competitive, somewhat competitive, or not very competitive, and why. Next discuss conduct: prices. Are prices similar within each county, or do they vary widely? Are prices lower in the more competitive county? Does pricing appear to be competitive or not competitive? Why?

Your written summary should be three typewritten, double-spaced pages, give or take one page.

Applied Assignment 3, ECON 5313, Darren Grant, Spring 2004.

On the back of this handout you will find the Arlington ISD Salary Schedule. Review the salary schedule and comment on the following questions, which ask you to examine how the salary schedule relates to the key labor market concepts we have discussed in class. Type up your group's comments, double-spaced, and hand them in; also keep a copy for yourself as we will talk about this assignment in class. Groups are self-selected with a maximum size of four people.

In your discussion, remember that the AISD is a public entity—it does not make a profit, and does not face much competition from private schools in the area, simply because there aren't that many of them, compared to the size of the AISD. That is, the AISD has a near monopoly in education in Arlington. Thus, you need not assume that the AISD will behave in the way we expect competitive, profit seeking businesses to behave. The main features of the AISD salary schedule, however, are typical for a public school district, though of course the salaries differ between districts.

1. The benefits of hiring additional teachers are the additional productivity they generate in the education of children. Explain, in intuitive terms, a teacher's marginal product. Would the "teaching input" be subject to diminishing returns? Explain. If the wages of teachers increased, would school districts want to hire fewer teachers in the long run? Would this be because of a scale effect, a substitution effect, or both? Explain.

2. Compensating wage differentials could be paid across employers; or they could be found across jobs within the same employer. Adopting the latter perspective, are compensating wage differentials a prominent feature of the AISD salary schedule? Why or why not? What kinds of job characteristics, for the jobs covered in the salary schedule, might motivate the offering of a compensating wage differential? What human resource management problems do occur or would occur in the absence of compensating wage differentials?

3. Is the on-the-job training gained as a teacher general skills or specific skills? Examine the way in which wages relate to experience. In what ways does the wage/experience relationship conform to human capital theory, and in what ways does it differ from theory? Describe how the AISD could be better off if their wage/experience relationship better conformed to theory. In doing this, show that the costs of changing the wage structure are outweighed by the benefits–the additional productivity generated by your changes.

4. How do wages respond to schooling in the AISD salary schedule? In what ways does this conform to human capital theory, and in what ways is it different?

5. What form of incentive pay is offered in the AISD salary schedule? What are some positive and negative features of this feature of the salary schedule? Incentive pay refers to pay designed to encourage effort and motivation–pay for schooling and experience was discussed above.

6. If you were going to change the AISD salary schedule, how would you do so, and why? Describe the benefits you expect to achieve by your changes, and some of the potential down-sides of your changes.