

ECON 6511: Advanced Applied Econometrics

Homework 5

Due in class February 21, 2018

The goal of this assignment is for you to read and understand a reasonably sophisticated empirical paper. The assigned article is: “The Patent Paradox Revisited: An Empirical Study of Patenting in the U.S. Semiconductor Industry, 1979-1995” by Bronwyn H. Hall and Rosemarie Ham Ziedonis. (I think this is a terrific paper by the way, though you might find the topic dry.)

1. Preliminary stuff

- (a) What is a patent? What are the requirements for patentability of an invention in the U.S.? (2 sentences)

2. Based on the Introduction (pages 101-105):

- (a) What is the paper’s main question or inquiry? (1-2 sentences)
- (b) What do the authors contend the answer to this question is? (2+ sentences)

3. Based on Sections 2-3 (pages 105-108):

- (a) What institutional change occurred in the early 1980s? (1 sentence)
- (b) How did this affect the behavior of firms? Which firms in particular? (4+ sentences)

4. Based on Section 4 (pages 111-115):

- (a) The authors are using panel data. What makes it a panel data set? Be specific. (1-2 sentences)
- (b) What is the left-hand side variable, p_{it} , on the bottom of page 112? Be specific. (1 sentence)¹
- (c) What (right-hand side) variables are contained in X_{it} ? List them.
- (d) The authors are most interested in the coefficients attached to which variables? For each variable, explain in one sentence what a statistically significant variable in Table 1 (Column 4) would imply?
- (e) What does the coefficient on Log P&E (per employee) in Table 1, Column 4 mean? Be specific. (1 sentence)

¹Technical note: Hall and Ziedonis (2001) use a poisson specification which is appropriate when the left-hand side or dependent variable is “count data” which takes on values 0, 1, 2, 3, 4? and the likelihood of each value diminishes, i.e. 0 is more likely than 1 which is in turn more likely than 2 etc. For right-hand side variables that are in log-form, e.g. Log R&D and Log firm size, coefficients have an elasticity interpretation. So a 1 percent change in the right-hand side variable leads to a percent change in the left-hand side variable (in this case, patents). We will discuss the poisson model in the last lecture.

(f) How do the results in Table 2 support the authors' argument(s)? (3+ sentences)

5. Based on Section 5 (pages 121-124):

(a) How and why do the authors control for patent quality? What do Figures 5 and 6 indicate about changes in patent quality? (3+ sentences)