600541 APPLIED BUSINESS ECONOMICS, 2021–22 TUTORIAL 10

If you wish to discuss the tutorial questions please come to my office hours.

1. (*Cabral* 17.2) Empirical evidence suggests that, between 1986 and 1991, consumers were willing to pay a significant premium for spreadsheets that were compatible with the Lotus platform, the dominant spreadsheet during that period.[1] What type of network externalities is this evidence of?

2. (*Cabral* 17.3) People are more likely to buy their first home computer in areas where a high fraction of households already own computers or where a larger share of their friends and family own computers: a ten per cent greater penetration in the surrounding city is associated with a one per cent higher adoption rate.[2] How can this be explained by network externalities? What alternative explanations are there?

3. (*Cabral* 17.4) In the early days of Automated Teller Machines (ATMs), there were very few interbank networks. That is, each bank's network was incompatible with other banks'. Empirical evidence suggests that banks with a larger network of branches adopted ATMs earlier. To what extent can network externalities explain this observation?

4. (*Cabral* 17.6) Consider the model of technology adoption in Cabral Secion 17.2. Suppose that the utility derived by an A fan from technology A is given by

$$\begin{cases} u + n_A & \text{if } n_A < \overline{n} \\ u + \overline{n} & \text{if } n_A \geqslant \overline{n} \end{cases}$$

   Utility from buying technology B is

$$\begin{cases} n_B & \text{if } n_B < \overline{n} \\ \overline{n} & \text{if } n_B \geqslant \overline{n} \end{cases}$$

   Analogous expressions apply for B fans. In other words, network externalities are bounded: once the network reaches a certain size ($\overline{n}$), no additional benefits are gained from a larger network.

   Show that, under these circumstances, and for certain values of u and $\overline{n}$, three different outcomes are possible:

   (a) the industry becomes locked into technology A;

   (b) the industry becomes locked into technology B;

   (c) the two technologies survive in the long run.

   [*Hint* Try to apply working similar to that used in section 5.2.2 of the lecture notes, while taking account of the fact that the network benefits cannot exceed $\overline{n}$. Whether lock-in is possible depends on the relative size of u and $\overline{n}$.]

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[1] Gandal, Neil (1994), "Hedonic price indexes for spreadsheets and an empirical test for network externalities", *RAND Journal of Economics*, 25, 160–170.

[2] Goolsbee, Austan and Peter Klenow (2002), "Evidence on learning and network externalities in the diffusion of home computers", *Journal of Law and Economics*, 45, 317–343.