

Section Exercise for February F29/M1: Externalities and Coase

The reference here is to the debate between Arthur Cecil Pigou's *Economics of Welfare* and Ronald Coase's "The Problem of Social Cost".

We have a railroad line, down which ten trains can be run each day. On any given day, either all trains must be "local" trains or all trains must be "express" trains.

The first local train of the day produces \$100,000 of value, the second \$90,000, the third \$80,000, and so on down until the tenth local train produces \$10,000 of value. Moreover, these trains impose *external costs*. While the first train does no damage to surrounding fields via sparks from the locomotive, the second train a day does \$5,000 of damage, the third train \$10,000 of damage, and so forth.

The first express train of the day produces \$99,000 of value—the extra speed breaks some of the cargo. The second express produces \$89,000 of value, the third express \$79,000 of value, and so on down. And these express train do twice as much damage to surrounding fields. The first express train does no damage, but the second does \$10,000, the third \$20,000, and so on down.

1) What is the best number of local trains for a benevolent utilitarian planner to run down this track each day? How much in economic value do these trains create? Is there any reason to ever run express trains?

2) Arthur Cecil Pigou says: The market system would run the wrong number of trains down the tracks. How many trains would the market system run down the tracks? What would be the economic value created?

3) Arthur Cecil Pigou asks: what tax should we impose on trains in order to make things come out right?

4) Ronald Coase says: You're wrong, Pigou! We don't need big government and big taxes and big regulation. All you need is a functioning system of tort law. Damaging someone's fields as a result of your activity is a tort! The farmers can sue the railroad. In order to settle the lawsuit, what will a rational railroad decide to do? How many trains will it decide to run, and how much will it be willing to pay the farmers to settle the lawsuit?

5) Then Arthur Cecil Pigou says: that assumes that judges are all wise and always rule the right way. Suppose legal doctrine says fires from smokestacks from train boilers are just things that happen--that railroads have no responsibility to prevent or minimize them, but that this is just one of the hazards of having a farm near where people decide to build a railroad? And Ronald Coase answers: it does not matter as long as we have a functioning legal system of contract law. The farmers can make a contract with the railroad not to run damaging trains. What contract to the farmers then make with the railroad?

6) But then Arthur Cecil Pigou says: It does too matter: what does the farmers have to pay in order to get the railroad to stop running so many trains if the railroad starts running express trains? What happens then?

7) How do you assess the different scenarios set forth in this exercise?