

23 | MORE COMPETITIVE MARKETS IN THE LONG-RUN

Purpose: To illustrate price determination in the long-run in a competitive market.

Computer file: **lrmkt298.xls**

Instructions and background information:

You are continuing on with your job as a consultant to the wine industry. In this problem set you will focus on predicting the long-run effects of a proposed tax on the industry. At the end you'll be asked to analyze the effects of a price fixing scheme that the government has in mind that will operate through a system of taxes or subsidies.

The graphical setup for this problem is the same as in the previous problem. The variables you can choose here are price, a firm's output, income, a tax rate, and the number of firms. Excel automatically computes all the other values in the tables.

The first proposal you're asked to consider is a tax of \$10 per case on all wine produced and sold. Starting from a long-run equilibrium for the firm and industry, you first find the *short-run* consequences of the tax. The number of firms is fixed in the short-run, so market adjustments take place through changes in price.

You're then asked to predict the new *long-run* equilibrium position of the firm and industry after the effects of the tax have worked their way through the market. In calculating this, remember that the long-run equilibrium price must leave the firm with zero profits.

Here are some things to watch for and learn as you do the problems:

- 1) If the typical firm in a competitive industry earns losses (negative economic profits), firms will leave the industry.
- 2) In the long-run, entry and exit of firms assures that price settles down at the minimum point of the long-run average cost curve. In the long-run equilibrium the typical firm earns zero economic profit.

Here are some hints to help you get the answers quicker:

- 1) You can use Goal Seek to find the number of firms in the long-run equilibrium. First set price to its long-run equilibrium level. Then use Goal Seek to make excess demand equal to zero by changing the number of firms.

- 3) Remember that in the long-run equilibrium the firm must still maximize profit by choosing $MR = MC$. But in the long-run the best the firm can do is earn a zero economic profit.

MATH MAVEN'S CORNER: The underlying equations here are the same as for the previous problem set. Notice also that the industry is assumed to be a constant cost industry.

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Questions

Reset all variables to their baseline values. Record the LONG-RUN EQUILIBRIUM values of the following variables:

- 1) Market price.
- 2) Market quantity.
- 3) Number of firms.
- 4) Industry profits.

Continue from the LONG-RUN equilibrium you found in questions 1) to 4).

- 5) What is the best output for the typical firm?
- 6) What are the firm's profits in the LONG-RUN equilibrium?

The government decides to put a tax of \$10 per case on all wine produced and sold. Start from the long-run equilibrium for the firm and industry.

- 7) What's the new SHORT-RUN equilibrium price?
- 8) What's the new SHORT-RUN market quantity?

Continuing on from question 8), what are the SHORT-RUN equilibrium values of the following variables?

- 9) Firm's output.
- 10) Firm's profit.

Now we turn to the long-run impact of the tax. What are the new (after-tax) LONG-RUN equilibrium values of the following variables?

- 11) Market price.
- 12) Market quantity.
- 13) Number of firms.

Continuing on from the last problem, what are the LONG-RUN values of these variables?

- 14) New LONG-RUN equilibrium firm quantity.
- 15) New LONG-RUN equilibrium firm profits.

Set all variables back to their baseline values, and put the market and firm in long-run equilibrium. Income now rises to \$60,000.

- 16) How many firms will there be in the new long-run equilibrium?

Continuing on from the last question, what are the new long-run equilibrium values of these variables?

- 17) Market price.
- 18) Market quantity.
- 19) Quantity for the firm.