Case Study 2-1

Total, Average, and Marginal Cost in the U.S. Steel Industry

The total-cost function of the U.S. steel industry in the 1930s was estimated to be

$$TC = 182 + 56Q \qquad (2\text{-}2)$$

(with all decimals rounded to the nearest whole number), where TC is the total cost in millions of dollars, and Q is output in millions of tons. Substituting various hypothetical values for Q into Equation 2-2, we get the TC schedules shown in the third column of Table 2-3. $AC = TC/Q$ in the fourth column of the table, and $MC = \Delta TC/\Delta Q$ in the fifth column. The TC, AC, and MC schedules are then plotted in Figure 2-3. Note that the TC curve is linear, with fixed costs of $182 million per year, and slope (MC) of $56 million for each million tons of steel produced. Thus, the AC curve declines continuously, and the MC curve is horizontal. These curves are a simplified version of the average- and marginal-cost curves shown in Figure 2-2. More recently (1989),* the total-cost function for Springs Industries, a leading producer of textile and home furnishings in South Carolina, was estimated to be

$$TC = 10.65 + 0.94S \qquad (2\text{-}2a)$$

where S is millions of dollars of sales. Thus, the total-cost curve of Springs is linear, with fixed costs of $10.65 million, declining AC, and constant MC at 0.94 (i.e., $940,000) per million dollars of additional sales (the slope of the TC curve). Thus, these curves look very much like those for steel in Figure 2-3 (the student should be able to sketch the curves for Springs on his or her own).

*Ronald P. Wilder, "Empirical Cost Analysis in Managerial Economics: A Short-Run Cost Estimation Exercise," November 1989. Mimeographed.

Table 2-3

Total-, Average-, and Marginal-Cost Schedules of the
U.S. Steel Industry in the 1930s

Q (In Millions of Tons)	182 + 56Q	TC (In Millions of Dollars)	AC (In Millions of Dollars)	MC (In Millions of Dollars)
0	182 + 0	$182	—	—
1	182 + 56	238	$238	$56
2	182 + 112	294	147	56
3	182 + 168	350	117	56
4	182 + 224	406	102	56

Source: Based on T. Yntema, in Committee on the Judiciary, U.S. Senate, 85th Congress, *Administered Prices: Steel* (Washington, D.C.: Government Printing Office, 1940).
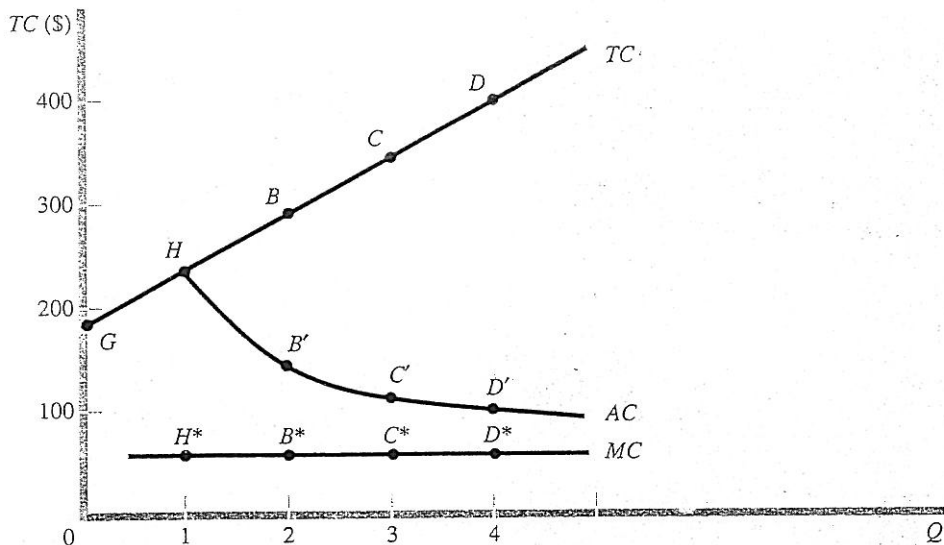

Figure 2-3
TC, AC, and MC Curves of the U.S. Steel Industry

The total-cost curve of the U.S. steel industry in the 1930s was estimated to be linear, with fixed costs of $182 million per year. Thus, AC declines continuously and MC is constant at $56 million per additional million tons of steel produced (the slope of the TC curve).