

Analysis of profit-maximizing monopoly firms falls into two cases, differentiated by the cost structures of the monopoly firm. One case, let's call it Case 1, involves a monopoly with a U-shaped ATC and a rising MC curve. Case 1 was covered in class and is analyzed in all editions of Mankiu at the beginning of the monopoly chapter. The second case, call it Case 2, investigates the profit maximizing behavior of a monopoly firm with an ATC curve that never bottoms (is always falling) and a low and constant MC curve. This is the natural monopoly case, the case where a single producer can produce a product at lower cost than two (or more) producers). This was covered in the lectures. Mankiu does not cover this in the 5th edition (some analysis in 4th ed., pp. 327-328, including Fig. 9). The purpose of this memo is to examine Case 2.

Case 2: Analysis of the Natural Monopoly Case: Output and Price Decisions, Monopoly Profits, Deadweight Losses, Regulatory Choices.

A. Natural Monopoly Case: Output and Price Decisions, Monopoly Profits, Deadweight Losses.

In the attached Figure 1, the natural monopoly's characteristic falling ATC curve and the low and constant MC curve are displayed. The monopolist faces the given Demand curve with its associated MR curve. The profit-maximizing output (Q^M) occurs where $MC=MR$ and the profit-maximizing price is found by tracing upward to point a, the price that the market will bear (P^M). The monopolist's profit is derived by finding the ATC at Q^M which is ATC^M . The monopolist's profit is thus $TR-TC$ or $[(P^M \times Q^M) - (ATC^M \times Q^M)]$ which is represented in the diagram as the rectangle labeled "Monopoly Profit."

Monopoly, of course represents a market failure, a sub-optimal outcome to society. Were a benevolent planner to choose the socially optimal output level, it would have to be Q^{OPT} . Why? Simply put, there are consumers on the demand curve between "a" and "b" who are willing to buy the monopolist's product and the product can be produced at a MC less than the P these consumers are willing to pay. This being the case society loses social benefits equal to the triangle "abd". This is labeled "Deadweight Loss." The deadweight loss represents the loss to society from the monopolist's restricting output to Q^M and charging a price above MC, P^M .



