

Module 3: Hospital Pricing and Competition

Unilateral and two-price markets

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Institutional Background

History of hospitals

- Before 1900: Just don't go to the hospital! (at least in the U.S.)
 - mainly charity care
 - hospitals were a learning experience for physicians
- Early 1900s: big safety and technological improvements
- Mid 1900s: huge growth, especially in wealthy and urban areas
 - Medicare and Medicaid in 1965 (Social Security Act)

Now

As we know, we now spend **a lot** on health care in the U.S., and a big part of that is very high health care prices (and a big part of that is hospital prices)

Ownership types

1. Private not-for-profit: About 60%
2. For-profit: About 20%
3. State and local gov't: About 20%

Source: [AHA Fast Facts](#)

Non-profit hospitals

What does it mean to be a not-for-profit hospital?

From an economics perspective:

- Hospital assumed to maximize some objective function, $u(q, z)$, subject to a production constraint
- q denotes quantity of care and z denotes quality of care
- Production is constrained by the break-even condition

Non-profit hospitals

What does it mean to be a not-for-profit hospital?

From a practical perspective:

- Profits must be re-invested into the hospital
- Must show "community benefit" (no consensus definition...includes uncompensated care, services to Medicaid, and certain specialized services that are generally unprofitable)
- No taxes! and tax-free bonds

Non-profit hospitals and tax benefits

- \$24.6 billion in tax exemptions in 2011
- \$62.4 billion in "community benefits"
- [Washington Post Article](#)

What do you think? Are these community benefits measured appropriately?

What is a non-profit hospital?

The real question is...what is the hospital's objective function?

- For-profit in disguise
- Output maximizers
- Tax-benefit maximizers
- Social welfare maximizers

Most empirical evidence doesn't find much of a difference between FP and NFP hospitals, except FPs have higher prices. Why is that?

For-profit hospitals

These are easier to study theoretically...just a standard profit maximizing firm.

- $\pi = P(q)q - C(q)$, where q denotes quantity of care
- Firm has some market power and so faces a downward sloping demand curve

Unilateral Pricing (depends on the objective)

Pricing for NFP hospitals

Objective is to maximize some function of profits and quantity of care provided, denoted by

$$U(\pi_j = \pi_{i,j} + \pi_{g,j}, D_{i,j}, D_{g,j})$$

where π_j denotes total profits for hospital j and $D_{i,j}$ denotes hospital demand from insurer i . We assume that p_j is exogenous and determined by a public payer, so the hospital need only set its price for private insurance customers, p_i .

Solution for NFP hospital

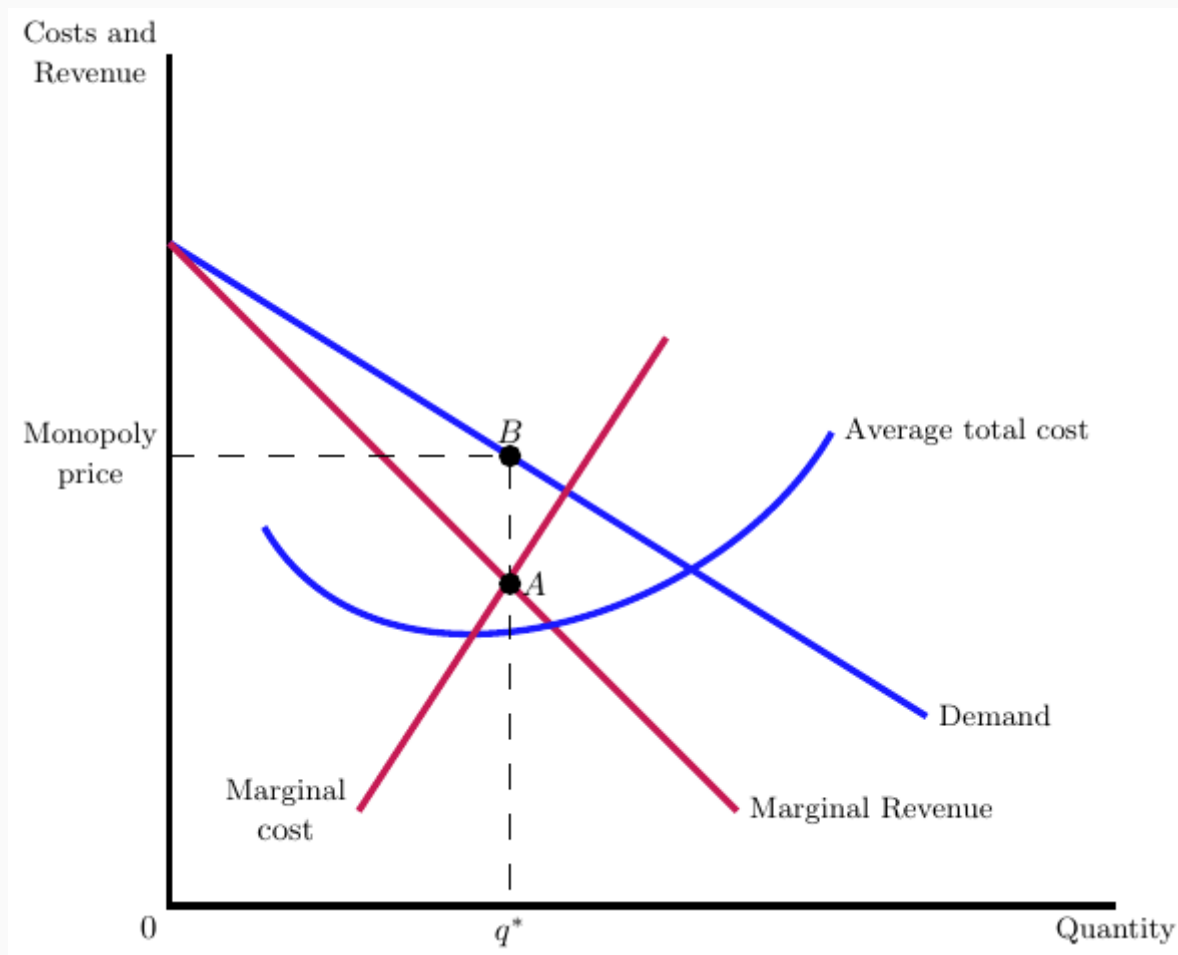
The hospital chooses p_i such that

$$\frac{dU}{dp_i} = U_1 \pi_1^i + U_2 \frac{dD_i}{dp_i} = 0,$$

where U_1 denotes the derivative of $U(\cdot)$ with respect to its first argument and similarly for U_2 .

In general, we can't solve this directly without knowing the hospital's utility function.

Assuming pure profit maximization



Example

Consider the firm's demand curve, $d = 16 - q$, and cost curve, $c(q) = 5 + q^2$. Where will the firm produce and at what price? What is the firm's markup over marginal cost? The profit function is, $\pi = (16 - q)q - 5 - q^2$. Differentiating with respect to quantity yields $-q + 16 - q - 2q = 16 - 4q = 0$, or $q = 4$. At this quantity, the price is $p = 12$, which is a markup of 4 over the marginal cost (or 50% markup).

In-class problem (unilateral pricing)

Consider the firm's demand curve, $d = 40 - 2q$, and cost curve, $c(q) = 5q + \frac{1}{2}q^2$.

1. What is the firm's profit maximizing choice of quantity and price?
2. What is the markup over marginal cost?

Two-price Market

Relationship between prices

In health care, providers usually face two prices:

1. A price fixed by Medicare and Medicaid, p_m .
2. A price that is negotiated with insurers, p_n .

How does p_m affect p_n ?

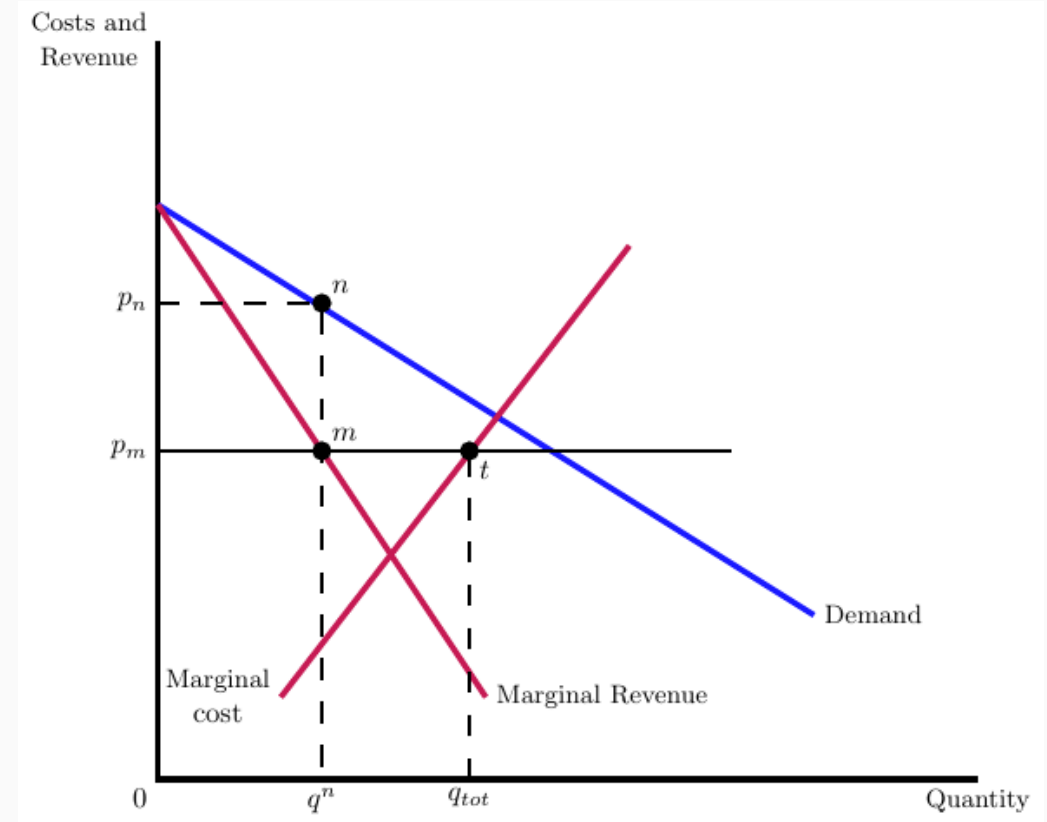
Two price market and NFP

Although we don't know the general solution for the private price, we can find how it varies with the public price...

$$\frac{dp_i}{dp_j} = - \frac{U_{11}\pi_1^i\pi_1^j + \frac{dD_i}{dp_i}U_{12}\pi_1^j}{\frac{d^2U}{dp_i^2}}$$

Two price market and FP

- Sell to "private" market as long as marginal revenue exceeds the public price
- Switch to "public" market otherwise, and sell to the point where price equals marginal cost



In-class problem (two-price market)

Consider the firm's demand curve in the private insurance market, $d = 16 - q$, and costs, $c(q) = 5 + q^2$. Assume that there exists a public insurer that pays a fixed price of $\bar{p} = 10$.

1. How many private patients will the provider serve?
2. How many public patients?
3. What if \bar{p} drops to \$9.

Cost-shifting

- Relationship between public and private price is important
- Speaks to anticipated effects of a change in Medicaid or Medicare rates
- Do hospitals "make up" the difference?

The idea that hospitals will increase private prices following a decrease in the public price is called **cost shifting**.

Cost-shifting

But how could it happen?

Assumes that hospitals could have increased private prices earlier but chose not too. This is technically possible if, for example:

- Hospital has very low margins (maybe negative with a lower public price)
- Insurer wants to prop up the hospital for competitive reasons
- Hospital has diminishing returns to profits

but economists usually see this as a smaller effect than most policy makers.