

We have examined the supply of health services as provided by Physicians in isolation as an individual firm. We will now examine the main service provider for health services, the hospital. Although every country has a varied organization in the provision of health service, hospitals are a main stay. The only differential is the kind of hospital organization that pervades the system, by which I mean

1. For-Profit Hospitals
2. Not-for-Profit Hospitals
3. Public/Government Hospitals

Although in Canada, most hospitals are public hospitals, in the US and most other countries, the health market consist of either all or a combination of the above types.

Most decisions made about the delivery of medical care in hospitals – whom to admit, which procedures to use, which drugs to give the patients, how long the patient should stay in the hospital, and where the patient should go upon discharge – are made by persons who are neither employees of the hospital nor under its direct control or supervision.

The Not-for-Profit Hospital Organizational Structure

We will use the not-for-profit hospital as the base of comparison with the other organizational structures. This will allow use to understand how to structure the objective function of differing types of hospitals.

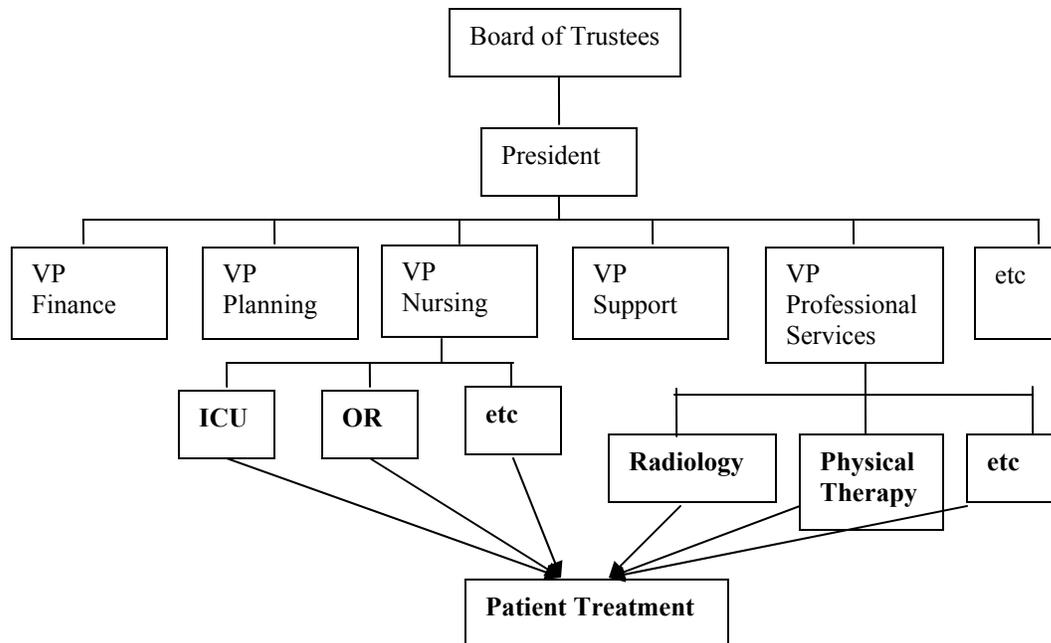
The key differential between a Not-for-Profit and For-Profit Hospital are;

	Not-for-Profit Hospital	For-Profit Hospital
1.	Can and do earn profits	Can and do earn profits
2.	No Shareholders to distribute profits to (In fact there are no legally designated residual claimant for the profits)	Distributes profits to shareholders

The importance of the fact that there are no legally designated residual claimants for the profits in a Not-for-Profit hospital implies that whoever the profits are distributed to eventually would affect the product mix, the costs, the input mix, and even the size of the hospital.

Organizational Structure of Non-Medical Staff/Line Management

The organization of the Not-for-Profit hospital is dominated by the Board of Trustees (/Board of Donors) empowered by the hospital's legal charter to manage the hospital's operation. This board is self-replicating and typically serves without pay. They then choose manager/president of the hospital whom they would provide overall strategic policy guidance to. The president/manager in turn has assistants who would assist in the management of the other divisions/departments as enumerated below, not unlike a typical firm.



Ultimately, these ground units are the support staff of the hospital such as the nurses of an operating room, the intensive care units, emergency rooms etc., as well as other specialists such as the pharmacists, therapist, X-Ray technicians, etc. All of whom would have a vice president right above their chain.

Organizational Structure of Medical Staff

The organizational chart nonetheless has excluded the doctors, who typically are not employees of the hospital even within a system that is non-public. The medical staff has their own organizational chart with their own bylaws that guide their operation, and they are divided by their medical specialty (See figure 8.2 of your text on page 253).

Doctors are guided by the bylaws for the medical staff, and are paid by pre-determined fees, hence are not in the direct payroll of the hospital. They receive admission into the medical staff by application to the hospital explicitly to the board of trustees. But the decision is ultimately vested with the incumbent medical staff. This implies that implicitly, just as the board of trustees, the medical staff is also self-replicating. Once a doctor gains admission into the medical staff historical evidence has revealed that revoking those privileges is difficult.

For a while recently, some hospital has made the move to enroll doctors into the payroll of the hospital organization through “integrated delivery systems”, that is this makes doctors an employee of the hospital, rather than fee-for-service agents. However, this trend has been reversed and halted due to the incentives problems under this scheme, in which we have discussed earlier.

The Process of Treatment of a Patient: Advantage and Disadvantages of Process

By law, activities carried out regarding patients begins with the doctor who “writes orders” on patient charts. These orders are then acted on by the respective specialists and

nurses. That is the doctor unencumbered by the organization of the hospital responds first to the needs of the patient through the use of the resources of the hospital, and consequently their independence from the organization. Further, since the patient is far better able to assess the performance of the doctor, the contract with the doctor rather than the hospital is in effect a “better deal” for the patient. This implies that in obtaining treatment with a hospital, she enters into a contact with two parties, the hospital, and the doctor who treats her.

However, as noted before, this separation of contract leads to inefficiencies, since the doctor is not required nor obliged to minimize the cost of treatment. **However, the question is whether the efficiency argument is a relevant one in health service provision?**

Who is the Residual Claimant?

As noted before, despite what its name suggests, even a Not-for-Profit hospital makes profits. The question then is who determines the use of these profits. We will discuss but only a few of these possibilities. Some possibilities are;

1. The Doctors
2. Hospital Board
3. Employees
4. Patients as suggested by legal charter.

Who is it then? It is likely that all of the above.

1. The Doctors as Residual Claimant (Paul and Redisch, 1973)

This idea claims that doctors direct the profits towards enhancing their profitability through better treatment possibilities, and hence increasing the demand for themselves. Problems with this argument are as follows;

- a. Doctors could own the hospital for themselves, and retain all profits to do as they wish. Retort: Not-for-Profit law confers tax advantages, and consequently the doctors would rather be part of a Not-for-Profit hospital.
- b. Doctors are not a homogenous group of individuals, further the requirements in their treatments are usually not the same. To the extent that this is true, the ensuing conflict may be too costly, so that profits would instead fall in time.

2. The Administrators as Residual Claimant

This arguments says that the Board of Trustees manage the organization so as to maximize their own utility though the choice between quality and quantity of output (as measured by hospital visits). Essentially, the Board maximizes their utility subject to **market constraint** (demand for their services), and the **production constraint**. We will be doing this in detail subsequently.

3. Employees or Patients as Residual Claimant

- a. Employees are paid higher than usual either willingly, or through the actions of unions.
- b. The argument pertaining to patients follows the legal charter of the hospital, so that it meeting that definition, the hospital reduces the prices that its patients face.

4. Shareholders as Residual Claimant: For-Profit Hospital

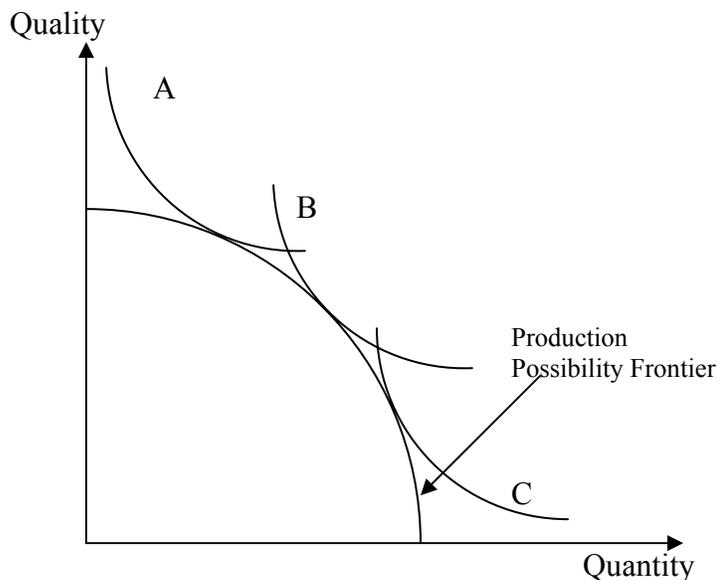
Although in a for-profit hospital, the shareholders do legally have a claim on the profits, given the structure of a market such as that in the U.S. where Not-for-Profit dominates, the behavior and management scheme may instead be similar in all facets.

A Qualitative Discussion of the Utility Function Model

Assumptions; Hospital Board is concerned with

1. Volume of patients treated, N .
2. Quality of treatment and service to these patients, S .
3. Let the Board consist of 3 members each with their own indifference curve which might not be the same.
4. The board faces a production possibility frontier in its choice of N and S , which is assumed to be concave like it's usually done in Economics. The reason being that it ensures that the solution is well behaved.

A priori, there is no reason why anyone of the board members would want the same thing for the hospital.



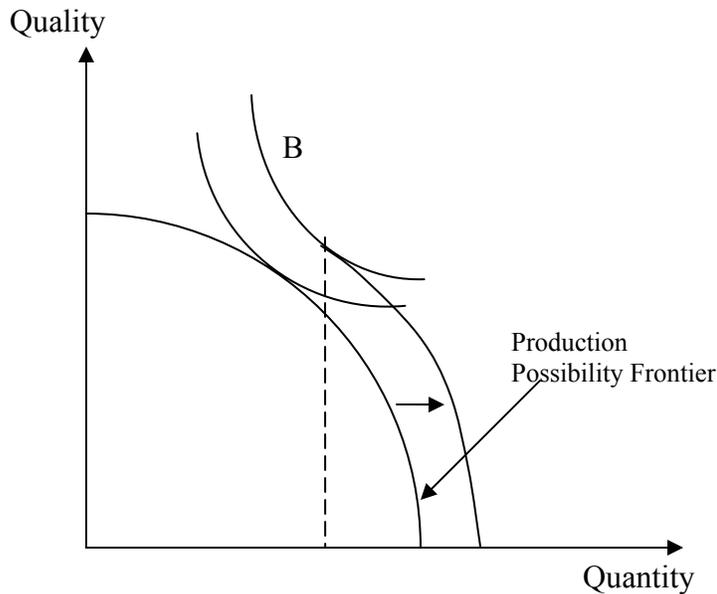
As in your intermediate microeconomics class, each board member chooses the equilibrium point by finding the point of tangency between their indifference curve and the production possibility frontier.

What appears from the above diagram is that B is the median voter, which implies that she, B, can enter into a coalition with either A or C to derive an equilibrium that is more in tune to her preferences. Further, this coalition is self replicating, not by law, but through optimal behavior of the members of the board.

From this argument, it is clear that either of the other parties we have claimed might be a residual claimant can have their say by influencing the median voter board member, or if they themselves have a say in the operation of the hospital. However, of the group of claimants, the doctors are the most likely party who can affect the choices of the hospital given their ability to affect the production possibility frontier.

There is no reason however to believe the median voter in a Not-for-Profit hospital should be the same compared to another Not-for-Profit hospital. For example, a Not-for-Profit hospital with its trustees largely from a university would be different from one largely founded by a church group. For example you'd be hard-pressed to find a Roman Catholic funded hospital to have abortion services in its production possibility set!

Further, the tax status of donations, and the not-for-profit status of the hospital makes them attractive targets by donors, who may have vested interest themselves in how they, the donor could affect the facilities and services of a hospital. For example, should the donor have had experience with a particular diseases, say cancer, either personally or through personal relations, would makes donations targeting that facet of treatment, and consequently the set of quality and services. Then donors themselves become one of the decision making parties. Using the diagram we had before, suppose a donor wishing to align towards trustee B's and C's (assuming the position of C is aligned with that of B) could alter the production possibility in the following manner;



The specified donation could be the discrete jump only if the hospital serves a minimum number of patients. Similar to the trustee game we were talking about above, the donors would also have to align themselves with the preferences of the median voter trustee, failing which their wishes would never be reflected in the output of the hospital.

It should be noted that the highly stylized and descriptive model we have highlighted is dependent on the rules and regulations that's determined by the government. For example, the government could stipulate the maximum amount of donations that can be given, or the degree of influence in which the donor could exercise, all of which would affect the eventual equilibrium. However, given a stable legal environment as is largely the case within a developed economy, it should come as no surprise that the behavior of a not-for-profit hospital, or whichever the dominant hospital structure might be which would inherently influence the behavior of other hospitals, would be stable (largely dependent on the median voter trustees' preferences), permitting empirical analysis consequently of each hospital as if it were an entity.

Hospital Costs

Economies of Scale

Given the choice of quality and quantity of services, the optimal mix of inputs are then determined, and consequently the cost of operation of the not-for-profit hospital. Given a particular production set, and cost of inputs, as the organization enlarges its operation, we then return to the usual idea of the scale of operation, i.e. increasing, decreasing, or constant returns to scale. In these studies, we try to ascertain whether the costs per unit of output increases, decreases, or remains constant as the scale of the organization expands. Empirical studies have found evidence of all sorts.

Essentially, each period reveals a snapshot in the genesis of the organization, and it is difficult to generalize the economies of scale of a particular organization, further we have already ascertain that the choices of a not-for-profit hospital is rather idiosyncratic. Essentially, to fully examine the effects of economies of scale, we should compare the costs of two hospitals that are identical except for size, or control of scope, and complexity, all of which is difficult.

Another problem arises from the fact that differing hospitals actually caters to differing segments of a market. For example, a community hospital caters for more “routine” care, as opposed to a large hospital within a big metropolitan city. Further, smaller hospitals make referrals to larger hospitals. Then the larger, more specialized hospitals cater to “more sick” patients. This would then alter the cost function of the hospital, which means that it is quite difficult to compare like hospitals one to another.

Further, differing hospitals have differing excess capacity with which to handle different exigent circumstances, which in turn affects their cost function.

Findings of Empirical Studies on Economies of Scale

Grannemann, Brown, and Pauly (1986) estimating jointly the costs of both inpatient and hospital outpatient department activity found that

- a. Marginal Costs of inpatient care rise both with the number of discharges and the number of patient-days the hospital produces. Precisely, they found that MC of a discharge at \$533 (1981 dollars) for low volume hospitals, \$880 for high volume, and \$1084 for high volume. Further, the MC for a day were \$168, \$237 and \$231 respectively. But these variations in costs seem to large to be explained by efficiency in operation. Essentially, it is likely that the cause of the bias is due to omission of relevant variables.
- b. They also found the economies of scale exist in the operation of emergency departments. But if that’s the case, why don’t we see evidence of more emergency departments made available in larger cities. That is, why don’t hospitals, in some sense merge their operation of emergency departments? The answer is that there are other costs involved, obviously in the merger of operations. Some possible omitted costs include;
 - i. Patient and their families’ travel/transport cost.
 - ii. Cost of altering the quality of treatment with merger. There are obvious gains through the increase in the size of the hospital in this regard, but so too the cost. Further just as possibly, quality could increase with size, beyond a particular threshold, so too cost would rise, and quality would fall.

Long Run versus Short Run Costs

An interesting question regarding hospital costs is how their costs varies with the patient load they handle. If the two varies in tune, then that cost is a *variable cost*. If it were to be fixed, then that would mean that the costs are *fixed*. The usual differences regarding long and short run costs pertain, that is in the short run capital expenditure items are fixed,

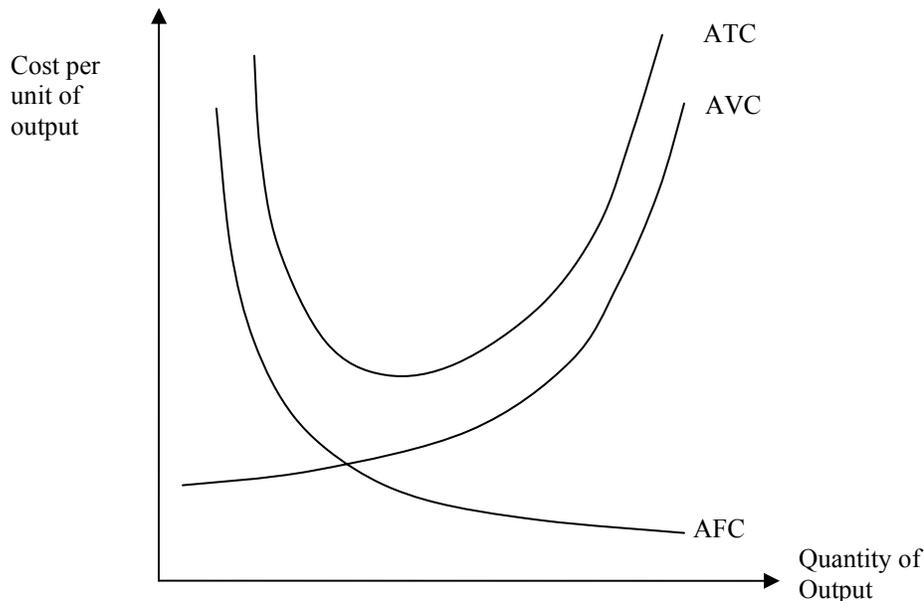
such as the number of diagnostic machines, but in the long run, pretty much everything is variable.

The question that has been the subject of some interest is how the cost of hospitals would vary as their load fall, particularly since the recent trend seems to be signaling a reduction in patient load on most hospitals in the U.S. The answer is dependent on whether we are viewing this from the long run or short run perspective.

Consider the following, in the short run despite changes in the trends of hospital utilization most hospitals would not consider the downsizing of their staffing in the short run. But in the long run, assuredly if those trends persists most would consider downsizing the staffing to rationalize their structure given market conditions. However, even then those beds, and rooms still exists, and cannot be altered in the “long run” in concert with those changing usage trends. In most states and provinces in the U.S. and Canada respectively, the government exercises control over prices of hospital stays. Under the changing trends, the pricing has to be changed to ensure that the hospitals remain viable.

The Cost Curves

Given our discussion, it remains unsurprising that the cost curves you have learned in intermediate microeconomics persists.



Quality of Care, Size, and Ownership

As a hospital's size varies, so too does the quality of care, given the expertise and case load they see. The key studies I wish to highlight here pertain to how experience with surgery affects outcomes within hospitals.

1. Lufts, Bunker, and Enthoven, (1979) using outcomes of 12 operations in 1,500 hospitals found that hospitals doing 200 or more of any of these procedures had mortality rates that were 25% to 40% lower than low volume hospitals. (Some

- procedures revealed a flattening in the learning curve at about 100 procedures. And there are others that revealed no apparent gain with frequency of encounters.). However, there are possible arguments for why these outcomes were observed.
- a. Superior quality hospitals attracted more patients, i.e. better outcome due to experience, but better doctors leading to better outcomes, assuming that better doctors are attracted to busy large hospitals. That is the argument is the usual causality issue. This is also termed the “*referral effect*”.
 - b. It is possible that experience with particularly similar procedures yield better outcomes, what is commonly termed *spillover effects*, which were not controlled for. Lufts (1980) after accounting for spillover effects which exists, still found own procedure effects.
2. In Hughes, Hunt and Luft (1987) they still continued to find effects as enumerated before, and in addition found a “*low volume doctor*” effect. Essentially the finding says a hospital is more likely to encounter poor patient outcomes, ceteris paribus, when low volume doctors did a high proportion of a hospital’s surgery.
 3. General consensus today are that there seems to hospital specific effects, but we are still unsure about “*referral effect*”, and “*practice makes perfect*” effect.
 4. McClellan and Staiger (2000) using Medicare data for U.S. hospitals in 1985, 1991, and 1994 found that unanimously that high levels of annual admissions of Medicare “Major Heart Attack” patients, specifically for every 100 admissions, 90-day mortality outcomes fell by about 1 to 1.5 percentage points. Since large hospitals tended to get a lot of these cases, this leads to grave differences in mortality outcomes between small and large hospitals. However, this study pertains to one complicated treatment only, and is difficult to generalize. It nonetheless reveals that for complicated treatment, quality improves with size. The authors also found that government run hospitals had 90 day mortality rates of about 1% to 1.8% higher than not-for-profit hospitals, and the for-profit hospitals fell somewhere in between.
 5. Interestingly Halbrook et al. (1992) found that experience with heart transplant surgery reduced the cost of the treatment.