Do Non-profit Enterprises Pay More For Their Labor Inputs?

An Examination of Hospital Behavior[*]

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Abstract

How the behavior of non-profit organizations differs from that of for-profit organizations has been the topic of a wide body of research. The motivational and behavioral differences resulting from the two organizational forms are particularly important in the U.S. health-care sector – an industry dominated by non-profit enterprise. This paper outlines some of the theories of non-profit hospital behavior and reviews some of the empirical work related to those theories. I then examine empirically whether there is a difference in wages and salaries paid to seven categories of hospital employee in different types of hospitals. *To my knowledge, there have been no studies that evaluate directly whether non-profit hospitals pay more than their for-profit counterparts.* I find that non-profit hospitals pay significantly higher wages to their employees in five of seven major categories. In the conclusion I highlight those theories that are consistent with these empirical findings and those that are not.

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Summary

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Introduction

Non-profit organizations take many different forms. They are often perceived as organizations that are funded substantially by donations, whose aim is to provide some charitable good or community service for the poor, and are generally expected to donate their services or to operate at a loss. However, this perception fails dismally as a definition of non-profit organizations. Many profit-making firms provide important services to the community, and many donate basic goods such as food and housing to the poor. On the other hand, many non-profit organizations provide services to the wealthy. Non-profit organizations may also compete with their for-profit counterparts, and many receive the majority of their income from the sale of the goods and services they provide.

The term 'non-profit' is also misleading. There is no rule that says that non-profit organizations may not make a profit. In other words, operating revenues may well exceed operating costs. However, non-profit organizations are constrained regarding what they do with any profit they make, and it is mainly this restriction that sets non-profit organizations apart from their for-profit counterparts.[1] This important distinguishing characteristic has been termed 'the *nondistribution* constraint' (Hansmann (1980)). This means that these organizations are legally prohibited from allowing anyone to have a legal claim on the residual income. 'The profits must either be reinvested in ways that directly advance the mission of the organization or be distributed to individuals (e.g., through lower prices to service recipients) who do not control the organization' (L. White (1995)).

According to Hansmann (1980, p.874), most states make little or no effort to enforce the non-distribution constraint. Although enforcement of the constraint is typically in the hands of the states' attorneys general, few take any appreciable steps to monitor or enforce the laws. The same is true of the other potentially interested government body: the IRS. Any organization that violates the non-distribution law risks losing its non-profit tax-exempt status. However, the IRS has not been especially keen to use this sanction, possibly because the "denial of exemption seems too drastic a response to a bit of self-dealing on the part of an institution's managers, particularly when it may well be the patrons of the institution who will suffer the most from it" (Hansmann (1980) p.874).

Weisbrod (1988, p.11) has referred to the type of non-profit institution that takes advantage of imperfect regulation as the 'for-profit in disguise'. Although such organizations are classified as non-profits, they actually pursue the private interests of managers and directors. There are numerous abuses in which these 'for-profits in disguise' might engage. One such abuse is the distribution of profits in the form of increased wages. As Weisbrod (1988, p.11) points out, "disguising a distribution of profit by calling it a wage payment is illegal, but given the costs of enforcement, excess payments to managers as well as to firms associated with trustees of the non-profits can go undetected". One of the ideas that this paper will test is that this type of behavior takes place in the non-profit hospital sector.

As Table 1 in the Appendix shows, the hospital sector in the U.S. is dominated by non-profit organizations with over 70% of inpatients receiving care in non-profit hospitals under non-government control. Moreover, private and public non-profit hospitals provided 88% of all U.S. hospital admissions in 1996. The relative proportion of non-profits and government-controlled hospitals does not seem to be changing very dramatically either. In 1986, the percentage of inpatients treated in non-profit and government hospitals was 90%, and the percentage of hospitals and beds in each type of hospital was virtually the same[2] as ten years later.

The dominance of non-profits in this sector may be due to a combination of different factors. One of these factors is largely historical. In the nineteenth century, hospitals were almost exclusively charitable institutions serving as sick-houses for the poor and were funded by charitable donations. However, in the twentieth century, charity cases are a small percentage of hospital patients – the vast majority of patient care is funded either by private or public insurance or by self-paying individuals. Nevertheless, the majority of hospitals have remained as non-profit enterprises.

This institutional inertia could be due to government policy: non-profit hospitals are exempt from all taxation and, due to the availability of personal income tax deductions, can solicit more charitable donations and volunteer labor than can for-profit hospitals. However, the incentives attributed to tax exemption may be somewhat overstated.

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[1] Other important distinctions associated with nonprofit organizations concern their tax status. Nonprofits are exempt from corporate income taxes and often from local property and sales taxes.
[2] American Hospital Association, AHA Hospital Statistics (1998), table 2.

In fact, as Hansmann (1980) points out, the tax law has followed rather than led the development of non-profit hospitals. "Non-profit hospitals for many years qualified for exemption as 'charitable' institutions only if they provided free or below-cost care to the poor; now that most non-profit hospitals provide no meaningful amount of such subsidized care, however, the definition of 'charitable' for federal tax purposes has been revised so that even a strictly commercial non-profit hospital qualifies for exemption" (Hansmann 1980, p.884). The nursing home sector also illustrates the lack of causality between the tax code and the dominance of the non-profit enterprise. Non-profit nursing homes have the same tax advantages as non-profit hospitals; however, this sector remains dominated by for-profit enterprise.

One government policy that most certainly did cause a major expansion in the number and capacity of non-profit hospitals was the Hill-Burton Act of 1947. The Act provided almost $4 billion in federal government funds that was used to support over ten thousand construction projects in non-profit and government hospitals between 1947 and 1971. However, funding under the Act ceased 30 years ago and, therefore, fails to explain the dominance of non-profit hospitals today.

A third possible cause for the dominance of non-profit hospitals concerns the self-serving interests of physicians. Pauly and Redisch (1973) argue that physicians control hospital output since, to a large degree, they determine the numbers and types of patients that are admitted and the type of care these patients receive. Hospital administrators, on the other hand, have limited power: they cannot afford to interfere with medical staff decisions or make decisions of their own that might deter large numbers of physicians from remaining on the hospital's staff. While physicians are generally not employees of the hospital, they require hospital services as a complementary input to their own services, and it is, therefore, in their interest to align themselves with those hospitals that keep their prices as low as possible. The lower the hospital prices, the greater the physicians' scope to raise their own fees. Physicians' hospital choice may be at least partially responsible for the continued dominance of non-profits in this sector.

Regardless of the reasons for their dominance, the fact remains that non-profit hospitals are a very important part of the hospital and health sectors. Consequently, the question of how they behave and whether their behavior differs from their for-profit counterparts has been the focus of a wide body of literature. Given the non-distribution constraint, the motives of decision-makers in non-profit organizations may lead to different types of behavior than that which is observed in for-profit enterprises. Conversely, the behavior of decision-makers within non-profit organizations is likely to provide an insight into their motives if that behavior differs from those of decision-makers in for-profit enterprises.

This paper will outline the main theories of non-profit hospital behavior and some of the empirical work related to those theories. I then specifically examine the differences in wages paid to seven categories of employees in

different types of hospital and relate these results to the theory. I highlight those theories that are consistent with these empirical findings and those that are not.

Literature Review; Theory and Evidence

The Quality-Quantity Non-profit Theory

One of the earliest theories forwarded for non-profit hospital behavior is that of Newhouse (1970). The Newhouse model is a utility maximization model that defines hospital preferences over the quantity and quality of output. Among the simplifying assumptions of the model are that quantity is one-dimensional (the quantity of cases treated over a given time) and that there is just one generic type of case. In addition, there is just one index of quality.   The hospital is assumed to produce at least cost and the quality-quantity frontier is as far out to the right as possible (see Diagram 1 in the Appendix). The hospital maximizes utility subject to a budget constraint that requires that the sum of patient-generated revenues plus donations equal the hospital's costs. Given a set of strictly convex utility curves (a further assumption of the model), the hospital would produce at a unique point of tangency between the highest feasible utility curve and the quality-quantity frontier (point A).

In this model, the 'quality' dimension could refer to almost any attribute consistent with the value system of the non-profit hospital. For example, it could refer to the newness of the hospital facilities, the expertise or sensitivity of the nursing staff, the amount of charity care undertaken, or the ability of the hospital to perform medically advanced procedures. The only theoretical restriction is that quality, however measured (and many of these attributes are not easily quantified), is costly and has routine first and second derivatives.

How does this relate to the question of whether non-profit hospitals are likely to pay their employees more? If we find that non-profits pay a wage premium over their for-profit counterparts, then we can conclude one of two things. First, one of the assumptions of the Newhouse model may be incorrect – non-profit hospitals may not produce at minimum cost. Alternatively, we might conclude that by paying their staff more, non-profit hospitals are behaving in a manner consistent with maximizing their quality index. For example, non-profits might, for reasons purely of prestige, insist on higher educational standards or greater work experience for their staff than the minimum level warranted by the job requirements.

If non-profits do pay a wage premium, then it is possible that the types of occupations to which it is paid may shed light on which of these alternatives should be chosen. For example; it is doubtful that a non-profit hospital is likely to enhance its prestige by paying a food service worker or a janitor more. Consequently, a result such as this would probably lead us to conclude that non-profit hospitals simply do not minimize costs. Alternatively, if only nurses get paid more, prestige may be enhanced, and this may be consistent with the quality-quantity frontier of the Newhouse theory.

The Property Rights Theory

A second theory of non-profit behavior concerns the concept of property rights. The owner of a for-profit firm will seek to maximize his utility by selecting the amount of monetary and non-pecuniary benefits (perquisites) necessary so that the marginal utility of any additional revenue is equal to the marginal utility of additional perquisites given up. The greater the non-pecuniary benefits taken (e.g., the greater the amount of money spent on plush surroundings and other benefits), the lower the amount of monetary profits available and vice versa. However, in publicly held firms or where other factors dictate that the day-to-day decisions are made by managers as agents of the owners, the goals of those of the decision-makers and those of the owners are not necessarily one and the same. In this case, managers may be tempted to take more non-pecuniary benefits than the owners would have done if they had been faced with the same set of choices. This over-consumption of perquisites is likely to happen because managers do not themselves bear the cost of those benefits in terms of lost profits.

It is possible to mitigate this problem by setting rules of conduct and by carefully monitoring management behavior – however, this may be a very expensive or even impossible task. A simpler and cheaper method would be to align managerial and ownership objectives through remuneration contracts. It is common in for-profit enterprises to reward managers and key decision-makers on the basis of bottom-line profits – thus making them more sensitive to the costs of non-pecuniary benefits and wasteful behavior. However, in non-profit enterprises, this alignment of incentives by financial means is not possible. As already discussed, managers and other employees are legally prohibited from sharing in the profits of the non-profit organization due to the non-distribution constraint. Consequently, either elaborate rules and monitoring procedures must be enforced or the managers and other decision-makers will behave in an economically inefficient manner.

An example of such economically inefficient behavior may arise if managers prefer to exert less effort in the performance of their role: taking a more relaxed approach to their job may be viewed as perquisite of working for a non-profit organization. Therefore, managers in non-profits may be less likely to supervise their staff as closely or to take as much care to minimize costs in purchasing both labor and non-labor inputs. They might also concentrate on other types of objectives that give the managers themselves personal satisfaction – they may choose to provide more charity care, for example. In summary, the Property Rights Theory implies that the attenuation of property rights leads non-profit enterprises in general to be less efficient than their for-profit counterparts.

There has been much research conducted concerning the efficiency of non-profit hospitals versus for-profits and the evidence is mixed. Clarkson (1972) found that for-profit hospitals are less likely to have formal budgets approved by a governing board, an American Hospital Association chart of accounts, and a written set of staff regulations (among other things). He also found that they spent less effort in the pursuit of unpaid bills. Both these results would tend to substantiate the Property Rights Theory. On the other hand, both Lewin et al. (1981) and Renn

et al. (1985) found that total operating cost per inpatient admission was about the same in both types of hospital. Pattison and Katz (1983) found that the results depended on whether or not the proprietary hospitals were part of a chain. They found that for-profit chains had about two percent higher operating expenses per admission than did (free standing) non-profit hospitals. However, the operating costs of free standing for-profits had two percent lower costs than the non-profits. Public hospitals had the lowest operating costs of all. Taken as a whole, these papers provide ambiguous results in terms of the theory.

Wilson and Jadlow (1982), in an attempt to reduce some of the problems of heterogeneous outputs inherent in other studies, concentrated on the provision of nuclear medicine services. They employed linear programming techniques to estimate parameters for the Cobb-Douglas specification of a deterministic and probabilistic production function. The authors concluded that the type of ownership does have a significant impact on hospital efficiency. Specifically, they found that government hospitals were less efficient and for-profit hospitals more efficient than non-profits – clearly a result in favor of the property rights theory.

Becker and Sloan (1985), using data from a 1979 national sample of US hospitals found that independent for-profits have higher costs per adjusted patient day than non-profits but are less costly in terms of cost per adjusted admission. However, the cost differences between the non-profits and for-profit hospitals were not significant at conventional levels, and there were virtually no differences between the non-profits and public hospitals. For-profits affiliated with a chain had 6 percent higher costs per case, but the coefficient on the binary variable for chain ownership was statistically insignificant. The authors conclude that there are no meaningful ownership differences in efficiency and that "the property rights paradigm does not fit the hospital industry well".[3]

Sloan and Steinwald (1980) estimated an input employment model with registered nurses (RNs) per bed, licensed vocational nurses per bed, other employees per bed, net plant assets per bed, expenditures on current non-labor inputs per bed, and number of beds as dependent variables. They reported that proprietary hospitals had lower expenditures on RN and other employee use than both non-profit hospitals and government hospitals. However, they found that this saving is fully offset by higher expenditures on non-labor inputs – another result that refutes the property rights theory.

Finally, Fournier and Mitchell (1997), in a comparison of four major proprietary chains in Florida, found that for-profit chains have significantly lower costs than non-profit hospitals. However, the authors attribute this difference to the technical efficiencies arising from chain ownership rather than from ownership status.

Other studies address the property rights issue in a less direct way. For example, it may be that managers of non-profit hospitals derive personal satisfaction from the amount of charitable cases undertaken. Since profit-

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[3] Becker and Sloan (1985).

motivated managers are less likely to be interested in providing charity care, we would expect to see higher levels of charity care in for-profit hospitals. Sloan et al. (1986) found that the amount of charity care that a hospital provides depends on its location as well as its ownership status. They found that for-profit hospitals outside cities provide more charity care in relation to their total charges than non-profit hospitals; those inside cities provide less than non-profits – but not much less. Norton and Staiger (1994) found that a hospital's ownership is endogenous to the proportion of uninsured patients and consequently they used an instrumental variables approach to determine whether non-profits and for-profit treat different proportions of charity cases. The authors found that, when for-profit and non-profit hospitals are located in the same geographic area, they provide the same amount of charity care. However, for-profit hospitals are more likely to locate in areas with better insurance and, therefore, treat fewer charity cases overall. Once again, the evidence regarding the property rights theory is mixed.

In terms of the focus of this paper -- the payment of wages -- the property rights theory would imply that we might expect non-profit hospitals to pay more than proprietary for-profit hospitals. As already mentioned, the manager in charge of hiring and reviewing remuneration in a non-profit hospital might not be as concerned with minimizing costs as his counterpart in a for-profit hospital. He might view his ability to reduce the amount of personal effort required to monitor changing labor market conditions as one of the benefits of working for a non-profit. Alternatively, the non-profit manager might actively choose to pay his staff more than they could get in for-profit hospitals and so effectively purchase their cooperation (Borjas et al., (1983)) – thus making his job easier in the day to day running of the hospital.

To my knowledge, there have been no studies that evaluate directly whether non-profit hospitals pay more than their for-profit counterparts. Borjas et al. (1983) focussed on the nursing home industry and used data from the 1973-1974 National Nursing Home Survey. The authors found that government controlled nursing homes pay substantially more for their labor than for-profit nursing homes (ranging from 2.5% more for licensed practical nurses to 16.31% more for aides and orderlies). They also found that church-controlled non-profit nursing homes pay more than for-profits (once the religious aspects of personnel selection were controlled for) and that secular non-profits pay slightly higher wages. However, in the secular case the estimated coefficients were not statistically significant at normal levels. The authors conclude that these findings as a whole are evidence in favor of the property rights theory.

Preston (1988), in an examination of the day care industry, also finds evidence in favor of the property rights theory. She divides the day care industry into two main sectors: the federally regulated sector of the industry and the non-federally regulated sector. The former is characterized by barriers to entry in the form of large information costs to obtain government support and higher quality standards while the latter is characterized by small firms with low fixed costs and zero profits. Both non-profit and for-profit firms operate in both sectors. Preston (1988) finds that where imperfect competition exists, non-profit day care centers pay more than their for-profit counterparts. However, in the non-federally regulated sector where there are no barriers to entry, no pay differential exists.

The Efficiency Wages Theory

The basic efficiency wages theory has been used to explain involuntary unemployment. Essentially, the theory claims that employers pay their staff wages in excess of those needed to clear the market since higher wages lead to higher productivity. Although unemployed workers would be prepared to work at the prevailing wage or even at lower wages, employers do not hire additional labor at lower wages since doing so would lower the morale and, therefore, productivity of workers already on the job.

One version of the efficiency wages theory, the shirking model, concerns the ability of employees to choose the level of effort to exert in the performance of their work. Since employment contracts can rarely specify all aspects of a worker's performance, and since piece rates are often impractical due to measurement issues, employers may choose to pay employees a wage in excess of market clearing in order to give them an incentive to work rather than shirk. This "efficiency wage" increases the cost to the employee of shirking – unemployment effectively becomes more costly and serves as a worker discipline device. If employers' abilities to monitor performance differ, then it is possible that there will be a distribution of wages paid to employees performing similar jobs. In the hospital industry, since non-profit hospitals are unable to link hospital financial performance to wages in the same way as for-profit hospitals, it is possible that non-profits might instead use higher wages as incentives for their workers.

Theoretically identical to the shirking model, the labor turnover extension to the efficiency wages theory predicts that firms will pay above-market wages in order to reduce their turnover costs (search costs, retraining costs etc). Again, employees will be more reluctant to quit the higher is the relative wage paid by the current firm. It is possible that wages in the hospital industry might vary between the non-profit and for-profit sectors if one or other sector has higher turnover costs. However, as far as I know, there has been no research on turnover rates or costs in the hospital industry and, consequently, further research would be required before we could conclude that hospitals' desire to reduce turnover costs is the source of wage differentials that might be revealed in the data.

An Informational Asymmetry Theory

Holtmann and Idson (1993) propose an alternative theory that, they claim, explains the wage differential between RNs in the non-profit and for-profit nursing home sector. They dispute the property rights theory for several reasons. First, they argue that since non-profit nursing homes are such a small part of the demand for the services of RNs, they have little incentive to pay wage premiums for identical nurses. Secondly, even if the observed premium arises because of the laziness of managers in determining competitive rates, the higher wages in this sector would lead to excess supply of nurses, which would eventually drive wages down to their competitive levels. Thirdly, they claim that such managerial laziness is unlikely since the board that oversees expenditures (and which presumably is committed to the organization's goals) would not allow such waste.

As an alternative, Holtmann and Idson (1993) claim that the higher wages in the non-profit nursing sector are a response by providers in this sector to the problem of informational asymmetry in the health services market. Buyers cannot tell in advance what quality of service they will receive and, thus, there is an incentive for all service providers to charge a high price yet set a low quality. Those service providers who genuinely offer a high quality service will choose to establish themselves as non-profit organizations and to subject themselves to the non-distribution constraint as a signal that their pricing reflects the quality provided. The payment of higher wages in non-profit nursing homes under this scenario is simply consistent with the higher quality service they provide (presumably, higher quality nurses will be more expensive).

Holtmann and Idson, controlling for selection bias, find that nurses with greater experience are more likely to be found in the non-profit sector and that, although both sectors pay more for greater experience, the magnitude of the differential is much greater in the non-profit sector. Furthermore, "tenure in the present job is rewarded more in the non-profit sector than in the for-profit sector" (Holtmann and Idson (1993), p.69). However, they also find that the returns to a Masters degree in nursing or a non-nursing field are more highly valued in the for-profit sector. When the authors further decompose the sectoral wage differential, they find that "workers in non-profit facilities are generally compensated at a lower rate for their productivity related attributes….and that the primary factor driving the wage differences are the differential attributes of the nurses per se, not the rate at which these attributes are compensated" (Holtmann and Idson (1993), p.73). In other words, the quality attributes themselves command lower wages in non-profit nursing homes, but the nurses within those nursing homes have more of the attributes that cause their overall wages to be higher.

Labor Donations Model

So far we have discussed theories that might cause wages to be higher in non-profit hospitals. However, there is at least one theory that predicts exactly the opposite – that non-profit organizations will pay their staff less. This is known as the labor donations theory. According to this theory, employees are socially motivated and are willing to accept less pay since their jobs involve a social benefit.

Weisbrod (1983) does not refer to the labor donations theory per se but his results are entirely consistent with it. He compares the earnings of public interest lawyers with those of lawyers working in the private sector and finds that the former are paid substantially less than the latter even when personal characteristics such as educational background, race, gender and employment experience have been taken into consideration. Weisbrod also finds that the lawyers' preferences are statistically significant at explaining their sectoral choice – they knowingly make financial sacrifices in order to work within firms whose politically liberal goals are consistent with their own.

Hypotheses

I intend to test the existing theories described above using hospital wage data for California for1997 in ways that, to my knowledge, have not previously been done.

If non-profit hospitals pay more, then obviously the labor donations model cannot be applied to the hospital sector; if not, the converse is true. With regard to the Newhouse model, results revealing non-profit wage premiums would imply either a refutation of one of the model's assumptions or a focus by hospital administrators on quality. As mentioned in the Quality-Quantity section above, which of these alternatives is appropriate might be revealed by examination of who is receiving the wage premium, if anyone.

If there are premiums being paid in the non-profit hospital sector, it is possible that property rights theory applies, but, once again, whether we can conclude this or not will depend on which types of labor receive the premium. If, for example, all types of labor are found to be receiving a premium, or if only skilled workers are receiving a premium and unskilled workers are not, then the theory would be substantiated. In this latter scenario, presumably, there might be an excess of unskilled labor, making it easy for non-profit administrators to hire at the competitive rate without much effort. On the other hand, if non-skilled workers receive the premium but skilled workers do not, then the property rights theory would be harder to support, since it is generally considered that there is excess demand for registered nurses at prevailing wages.

Wage premiums in the non-profit sector might also support the idea that these hospitals are responding to informational asymmetry in the market by choosing to supply higher quality output and pay for higher quality inputs. Again, it depends on who is found to be receiving the premiums. Also, by (at least partially) controlling for quality, we can determine whether the quality motive is really present.

Finally, if only managerial staff are paid a non-profit premium, we might take this as evidence of Hansmann's for-profits disguising themselves as non-profits.

Econometric Model

The model to be estimated is of the general form:

$W_i = f(\alpha, \mathbf{X}_{hj}, \mathbf{E_j})$.   (1)

The following semi-log form is also utilized:

$L\_W_i = f(\alpha, \mathbf{X}_{hj}, \mathbf{E_j})$.   (2)

The Dependent Variable

The dependent variable W_i is the average hourly wage rate for occupational group i (i = 1- 7) where the categories of hospital employees are as follows:

i = 1   Managerial and Supervisory Employees

Typical job titles of employees included in this category are Administrators, Directors, Managers, and Supervisors.

i = 2   Technical and Specialist Employees

Employees in this category generally perform activities of a creative or complex nature, and are often licensed or registered. Examples of employees in this category are Technologist, Technician or Accountant.

i = 3   Registered Nurses

This category includes only registered nurses involved in the direct nursing care of patients – not those employed in roles as supervisors or instructors.

i = 4   Licensed Vocational Nurses

Again, this category includes only those licensed vocational nurses involved in the direct nursing care of patients.

i = 5   Aides and Orderlies

This classification includes non-technical personnel employed in the direct nursing care of patients.

i = 6   Environmental and Food Service Employees

Typical job titles in this category include Housekeeping Aide, Cook's Helper, Guard, and Maintenance Person.

i = 7   Clerical and Other Employees

The largest part of this category relates to non-technical personnel employed in record keeping, communication, and other administrative type functions.

Explanatory Variables

We turn now to the explanatory variables.

α in the model refers to the regression intercept.

X_{hj} refer to a set of variables for hospital h in county j used to control for hospital-specific differences such as ownership, size, quality, and ability to cope with emergencies. The specific X_{hj} variables involved are as follows:

'NFP'   - whether the hospital is a non-government non-profit enterprise.[4]

'CHURCH'   - whether the hospital is church controlled.

'GOVT_OWN' - whether the hospital is controlled by the state, county, city, or a hospital district or authority.[5]
For reasons of collinearity, whether the hospital is for-profit is omitted from the set of ownership variables.[6]

'BEDS'   - the number of licensed beds in each hospital – to control for hospital size.[7]

'SCHED'   - the percentage of patients who are admitted on a scheduled basis – a measure of how able the
                  hospital is to deal with unexpected cases.

'DIED'   - the percentage of patients who died in 1996/7 while in the hospital – potentially, a cloudy proxy
                  for quality.[8]

'MEDICARE'   - the proportion of the hospital's cases for which the greatest source of payment is expected to be
                  Medicare.

'MEDICAID'   - the proportion of the hospital's cases for which the greatest source of payment is expected to be
                  Medi-Cal.[9]

'OTHER'   - the proportion of the hospital's cases for which the greatest source of payment is expected to be
                  covered by Worker's Compensation and by organized charities such as Cerebral Palsy Foundation,
                  Easter Seals, March of Dimes, and payments by other countries. These charity cases were not
                  included under the Charity category (see below) since the latter is reserved for cases for which the
                  hospital would absorb the cost.

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[4] Includes those hospitals classified by California's Office of Statewide Health Planning and Development (OSHPD) as 'nonprofit corp' and 'nonprofit – other'.
[5] Includes those hospitals classified by OSHPD as 'State', 'County', 'District' and 'City'.
[6] The 'For Profit' classification includes those hospitals classified by OSHPD as 'Investor – partner', 'Investor Corp', and 'Investor – Individual'.
[7] This is the number of licensed beds stated on the hospital's license at the end of the reporting period, excluding nursery bassinets and licensed beds placed in suspense.
[8] It could also be a proxy for the age distribution of the hospital's patients or of its the willingness to take tough or terminal cases. No more appropriate measure of hospital quality was available.
[9] The federally-aided, state operated and administered Medicaid Program that provides medical benefits for certain low-income persons in need of health and medical care.

'GOVT'   - the proportion of the hospital's cases for which the greatest source of payment is expected to be either the County Indigent Program, the CHAMPUS/CHAMPVA/VA program, or Other Governmental agency including California Children's services, Title V, and Short-Doyle.

'HMO'   - the proportion of the hospital's cases for which the greatest source of payment is expected to be from either an HMO or a PPO.

'PRIVATE'   - the proportion of the hospital's cases for which the greatest source of payment is expected to be from private insurance companies[10] or Blue Cross / Blue Shield. This category specifically excludes HMOs or PPOs, which tend to arrange discounted fee arrangements with hospitals.

'CHARITY'   - the proportion of the hospital's cases for which payment is expected to be pursuant to the hospital's Hill Burton obligations, covered by the hospital's charity care policy, or is free.

To avoid collinearity issues, the final payment source category – that of patients who pay for their own treatment – is excluded from the regression.

'TEACH'   - whether the hospital engages in teaching.[11]

'SYSTEM'   - whether the hospital is part of a system or network under common control.

'SURG'   - the proportion of the hospital's cases that are categorized by OSHPD as surgical as opposed to medical or not categorized. It is possible that hospitals with higher rates of surgery require more skilled personnel and are therefore prepared to pay higher wages.[12]

The $\mathbf{E_j}$ variables in the model are designed to control for countywide factors that might influence the hospital wage rate. These are:

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[10] Often referred to as 'traditional fee-for-service' type plans.

[11] To be classified as a teaching hospital in this context the hospital had to either be approved to participate in residency training by the Accreditation Council for Graduate Medical Education, or have medical school affiliation, or have a hospital controlled professional nursing school, or be a member of the Council of Teaching Hospitals of the Association of American Medical Colleges, or have an internship approved by the American Osteopathic Association, or have residency approved by the same.

[12] Ideally, variables such as length of training and work experience would also be included in the regression. However, due to the lack of availability of these variables, it is hoped that the proportion of surgical cases might serve as a proxy for quality of staff.

'HHI'   - county Herfindahl Hirshmann index[13] - calculated from the number of inpatient cases treated at each hospital. This variable is a measure of hospital concentration in the county. Where two of more hospitals in the same county are under common control, their combined number of inpatient cases was used to calculate the Herfindahl Index. The HHI may be an imperfect measure of the hospital's 'true market'. As a consequence of imperfect measurement, the coefficient on HHI is likely to be biased towards zero.

'EMPLOYEE_HHI'- the Herfindahl Hirshmann index for each of the seven employee categories. Calculated from the number of hours worked by each category of staff at each hospital, this variable is an imperfect measure of the availability of employment alternatives for the different types of hospital staff. For some employee categories – e.g., clerical or food service – the alternative job opportunities are likely to extend far beyond the boundaries of hospitals; even for RNs, nursing home or other quasi-medical facilities may be alternatives.

'RETAIL_W'   - county average retail wage payment ($), Q1 1996.[14] This variable is used as an indication of the general wage (cost) level in the hospital's county.

'PER_CAP'   - per capita income by county in 1996 ($).[15]

'POPN_DEN'   - population density within the county (people per square km) in 1996.[16]

'UE'   - average unemployment by county 1996/1997 (%).[17]

Data

Most of the hospital data were obtained from the Office of Statewide Health Planning and Development (OSHPD) in California. OSHPD's Patient Discharge Data for 1997 provided patient-level variables such as the percentage of cases that died, the percentage of cases involving each different type of payment source within each hospital, and the number of cases treated in each hospital in the county. This last variable was used to calculate the HHI variable described above. These data were joined to another dataset, also from OSHPD – the Individual

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[13] Defined as Σs_{hj}^2 where s_{hj} is the share of hospital h of the total cases treated in the county j.
[14] From County Business Patterns 1996 published by the U.S. Census Bureau, in *the Official Statistics*, Nov 23, 1998
[15] From Survey of Current Business, May 1998, U.S. Department of Commerce, Economics and Statistics Administration, Bureau of Economic Analysis
[16] From the 1998 County and City Extra, Annual Metro, City and County Data Book.
[17] From the Bureau of Labor Statistics Data Website.

Hospital Financial data.[18] This dataset provided the average hourly wage rate for seven different occupational categories and the number of licensed beds in each hospital.[19]

The hospital's teaching status, its ownership status, and whether it was part of a hospital system or network were obtained from the 1997 American Hospital Association (AHA) Guide.[20]

The sample of 382 hospitals includes only those hospitals that OSPHD lists as providing general acute care. Long-term care facilities, specialist, and State and psychiatric health facilities are specifically excluded in order to avoid any treatment-specific issues related to these kinds of hospitals. Children's hospitals are included in the sample on the basis that the type of care is similar to that supplied at general hospitals; it is only the age of the recipients that is different from general hospitals. This yields a sample size of 2659 observations (382 hospitals x 7 occupational groups) less 15 observations where hospitals did not employ a particular type of staff. Descriptive statistics for the data are shown in Table 2 in the Appendix.

Results

Individual regressions for the separate occupational groups were performed, and the results are presented in Table 3[21]. The important variables from the perspective of this paper are the non-profit dummy (NFP), the government control dummy (GOVT_OWN) and the church control dummy (CHURCH). It is interesting to note that the non-profit variable is positive and significant for five of the seven occupational groups. Only Aides and Clerical staff do not seem to gain from the fact that they work in a non-profit hospital. Of the groups that do benefit, management benefits significantly more from a hospital's non-profit status than do the other groups that benefit. In fact, they receive a premium that is two and one-half times that of the next greatest beneficiary, registered nurses. Apparently, management of non-profit hospitals not only pays most of their employees more but also pays themselves a premium relative to their for-profit counterparts.

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[18] Individual Hospital Financial Data for California 1996-97.

[19] Excludes beds in suspense.

[20] Annual county unemployment rates were obtained from the Bureau of Labor Statistics for 1996 and 1997, and a simple average was taken of the two so that it is more in line with the reporting time period of the discharge and financial data – namely, June 1996 to June 1997. Population density figures for 1996 were obtained from the 1998 County and City Extra Annual Metro City and County Metro Book. Retail Wages for the first quarter of 1996 were obtained from the Census Bureau's County Business Patterns for California while Per Capita Personal Income for 1996 was obtained from the Survey of Current Business, May 1998, published by the US Department of Commerce, Economics and Statistics Administration, Bureau of Economic Analysis.

[21] In principle, because the average wage is, by definition, grouped data (calculated from different numbers of employees across hospitals), one would normally weight observations by the square root of the number of hours worked. However, efforts to weight observations in this way increased rather than decreased the degree of heteroscedasticity in the model.

The government ownership variable is also significant at the 95% level for all occupational groups. Once again, the non-profit nature of this type of hospital seems to affect employee wages. In government-controlled hospitals, however, the large difference between the premium taken by management and that paid to other types of worker does not appear to exist (registered nurses and food workers appear to receive a similar premium in absolute terms to that of management). Further research would be required to discover whether additional rules and regulations exist in this type of hospital that affect the way that management rewards itself and its staff. Perhaps, for example, there is a greater flow of wage information or a greater incidence of unionization in government hospitals than in proprietary non-profit hospitals. This may, in turn, lead to management's being unable to reward themselves with such large premiums due either to issues of perceived fairness or simply because there is less money left over once the other occupational groups have been paid. Both these explanations seem feasible given the fact that all occupational groups, with the exception of management, receive a larger premium in government-controlled hospitals than in proprietary non-profit hospitals.

In church-controlled hospitals only management employees appear to receive a statistically significant premium at the 98% level. However, food and environmental service personnel and registered nurses receive a smaller premium that is significant at the 91% level. Why Food Service personnel should receive a premium (especially when the other unskilled group, Aides, does not) is unclear.

Of the other variables included in the regression, only three are statistically significant across most occupational groups. These are SURG, RETAIL_W and PER_CAP. As already mentioned in the Econometric Model section above, the proportion of surgeries performed (SURG) by each hospital was included as a proxy for quality of staff[22]. This was based on the assumption that those hospitals that undertake a greater proportion of surgeries might look for more highly qualified staff. The only groups for which the SURG variable was not significant were clerical and technical staff – the only occupational groups that do not have any influence on the daily welfare of patients. This result supports our choice of this variable as a proxy for quality.

The other quality-related variable, the proportion of patients that died (DIED), is not significant for all except one occupational group. This may seem strange at first given the coefficient results on SURG. However, the DIED variable might actually be measuring the severity of illness of incoming patients – over which the hospital has only moderate control – rather than any medical choices made by the hospital itself.

We would expect that retail wages (RETAIL_W), as an indicator of general wage levels in the county, and per capita income (PER_CAP), as an indicator of demand pressures in the surrounding area, would have an influence on the average hourly wages paid to all occupational groups. In fact, as expected, both of these variables were positive and statistically significant at the 94% level or above for all occupational groups.

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[22] Other variables (years of education, years of work experience, tenure in the current job, etc.) might also share this role but were not available.

Population density (POPN_DEN), payment source (MEDICARE, MEDICAID, OTHER, GOVT, HMO, PRIVATE and CHARITY), and whether the hospital is a registered teaching hospital (TEACH) do not appear to have any effect on wages for the most part, nor do the relative bargaining powers of hospitals and employees (HHI, CTY_SHR and EMPLOYEE_HHI). Although we might have expected these to be significant, it is apparent that other factors such as the control of the hospital and the quality of staff are more important in determining wages.[23]

The question now arises as to whether the different occupational groups can be treated from a statistical perspective as coming from the same 'population universe'. In other words, do all the explanatory variables have the same effect across occupational groups and do the occupational groups have the same intercept term - would pooling the data be a valid and more statistically efficient way to proceed? A pooled regression of wages against the independent variables without accounting for differences in types of worker (i.e., without including group dummy variables) was run and yielded a very low R-squared of .070. (Nevertheless, the coefficients on the not-for-profit and the government ownership variables are significant at the 96% level.) A Chow test provided an F-statistic of 130.6 – which, when compared to a critical value of 1, clearly rejects the hypothesis that pooling the data is appropriate. This result is hardly surprising given the summary statistics in Table 2, which clearly show large differences between the mean wages of the different occupational groups.

The semi-log model in equation (2) in the Econometric Model section was estimated for the 7 separate occupational groups and the results appear in Table 4. Qualitatively, the results are similar to those given by the regressions in Table 3.

Using the semi-log model, the NFP variable is again significant at the 90% level for six of the seven occupational groups (although the variable is not significant at the 95% level), and the estimated coefficient on this variable is once again largest for the managerial group. The premium paid to management in non-profit proprietary hospitals, therefore, is not only larger in absolute terms but is also proportionally larger than for all the other occupational groups – a case of management rewarding itself in a more than proportionately generous manner. As with the regressions performed in absolute dollar terms, this result is not repeated in Government controlled hospitals. In the latter hospitals, all employee groups receive a proportionally higher wage than their for-profit counterparts (at the 94% significance level), and the wage premium is more evenly spread over the other five occupational categories, with most groups receiving between 4.9 and 6.6 percent premiums. Food and Environmental Service personnel receive a premium of 13% more due to the non-profit status of their employer, and why this should be so much larger than the premiums for the other groups is not clear. In church-controlled

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[23] The sign and significance of the unemployment (UE) variable may be problematic from the viewpoint of model verification since we would expect that wages should be partially influenced by the level of unemployment in the surrounding area.

hospitals, only Management and Food and Environmental Service personnel have proportionally higher wages, and the premium is approximately 7 percent higher for both. Once again, why this should be true for Food and Environmental Service remains unclear.

A second pooled regression was estimated using the semi-log model with the specification in equation (2). Such a pooled model, if valid, would restrict the coefficients to be the same across occupational groups in a similar way as the pooled regression of equation (1). However, the interpretation would be less restrictive as it would imply that each independent variable causes the same proportional (rather than absolute) change in the average hourly wage across occupational groups. A Chow test to check the validity of pooling using the semi-log model also revealed that the different occupational groups could not legitimately be treated as responding to the independent variables in the same proportional way.[24]

Two further pooled regressions were performed, by adding a set of occupational dummy variables to both equations (1) and (2); in essence these were 'fixed effect' models. Despite very high R-squared values for both regressions (0.875 in the first case and 0.882 in the second case), F-tests to examine whether the slope coefficients are the same across groups once again led to the conclusion that pooling the data was an inappropriate thing to do in both cases.[25] In other words, the independent variables do not have the same absolute or proportional effects on wages across all the occupational groups taken together even allowing for occupational specific effects.

Conclusions

From the above results, it is obvious that the nature of hospital ownership and control have an impact on the wages paid to employees but that hospital ownership does not have the same absolute or proportional effect for all employees. The main conclusion is that non-profit hospitals, regardless of type of control, tend to pay at least some of their employees more than for-profit hospitals. Clearly, the Labor Donations model does not fit the hospital industry.

Why the non-profit hospitals pay more is subject to debate. As discussed, the Property Rights theory would imply that managers pay their staff more because it is either the 'easy thing to do' or it buys their staffs' cooperation. This may be what is happening in proprietary non-profit and government controlled hospitals. (Technical staff, RNs, Vocational Nurses and Food Service personnel get paid more in both these types of organizations, and Aides and Clerical staff get paid more in proprietary non-profits.) It may also explain why Management itself gets paid more in these types of hospital. The management group is quite broadly defined in the data, and we are unable to separate empirically those managers who make the remuneration decisions from those whose work does not involve

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[24] The $F_{(144, 2491)}$ statistic was 138.6 compared to a critical value of 1.
[25] The $F_{(138, 2491)}$ statistic was 2.65 compared to a critical value of 1 in the first case and 2.54 compared to a critical value of 1 in the second case.

this type of control. It could be that those who are making the payment decisions are also attempting to buy the cooperation of their management colleagues or that they simply do not monitor the labor market very closely.

The efficiency wage theory may also provide an explanation for the non-profit wage premiums. These hospitals may be paying more in order to reduce shirking, while their for-profit counterparts may not need to rely on these kinds of incentives. As in the property rights model, the lack of ability to monitor staff perfectly behavior or to link staff performance to profits may be the cause of the wage differential. (This conclusion is slightly weakened, however, by the fact that Aides and Clerical staff in non-profit hospitals do not receive wage premiums while the other unskilled group (Food Service) does.) A second way in which the efficiency wage theory might explain the observed pattern of wages concerns labor turnover. If turnover costs are higher in non-profit hospitals, it may be efficient for hospitals at these hospitals to pay staff more in order to reduce staff turnover. In this case, the disparate treatment of the unskilled workers might be explained by different turnover costs across groups. Further research is needed to determine whether this is the case.

The fact that Management receives a substantial premium in proprietary non-profit hospitals may also indicate a case of 'disguised' for-profit behavior in which Management is ignoring the non-distribution constraint and paying itself a substantial premium out of profits. A finer breakdown of the data into those management employees that have payment control and those that do not would be required to determine whether this is happening. Regarding the church-controlled hospitals, it appears that this is indeed the case: management is simply paying itself more and behaving as though it was a for-profit owner.

With regard to the Newhouse theory, if non-profit hospitals try to maximize a quality-quantity utility frontier that includes prestige as part of the quality index, then we might expect them to pay more to those employees who have a highly visible and direct impact on patient's welfare. In other words, we might expect them to pay wage premiums to Registered and Vocational Nurses and, possibly, to Food Service staff as these groups have a strong influence on patients' perception of hospital quality. This idea is born out by the results for proprietary non-profits and government-controlled hospitals. However, in this case, we might also expect that both of these types of hospital would treat their Managerial, Technical, Aides and Clerical staff in ways similar to each other. We would expect that the coefficient estimates on GOVT_OWN and NFP would either be significant in the Management, Technical, Aides and Clerical regressions or not – but that if one were significant, the other should be too. While this is true for Management and Technical staff, this is not the case for Aides and Clerical staff. Consequently, we would have to conclude that one of the Newhouse assumptions is being violated (that of cost minimization) and thus that the model does not fit the industry well.

It is unlikely that the Holtmann and Idson (1993) Informational Asymmetry theory applies here. As discussed, these authors concluded that non-profit nursing homes pay more for higher quality staff. However, we have controlled (at least partially) for quality of staff, yet evidence of a non-profit premium remains. Thus, we might

conclude that, although this theory is appropriate to the nursing home sector, it does not do so well in the hospital sector.

In summary, then, wages are generally higher in non-profit hospitals than in for-profit hospitals. Furthermore, it appears that the property rights theory at least partially explains the non-profit premium, although it is possible that some of the differential may arise from non-profit hospitals behaving as 'for-profits in disguise' and ignoring the non-distribution constraint. The efficiency wage theory provides a further explanation of the observed wage patterns although further research is needed before we can conclusively say that the observed wage patterns conform to those predicted by the theory.

TABLE 3 - RESULTS OF 7 WAGE REGRESSIONS

	Management Coefficient _t statistic_	Technical Coefficient _t statistic_	RNs Coefficient _t statistic_	VNs Coefficient _t statistic_	Aides Coefficient _t statistic_	Food Service Coefficient _t statistic_	Clerical Coefficient _t statistic_
Constant	3.537	3.725	-6.599	3.036	-3.485	-5.159	-4.441
	_0.514_	_0.815_	_-1.261_	_0.835_	_-1.155_	_-1.429_	_-1.311_
GOVT_OWN	1.540	0.978	1.545	0.917	0.730	1.422	0.717
	_2.096_	_2.006_	_2.765_	_2.364_	_2.292_	_3.788_	_1.977_
NFP	3.002	0.765	1.186	0.641	0.351	0.707	-0.261
	_5.530_	_2.125_	_2.871_	_2.233_	_1.489_	_2.535_	_-0.974_
CHURCH	1.920	0.393	1.057	0.611	0.286	0.652	-0.459
	_2.565_	_0.792_	_1.855_	_1.553_	_0.883_	_1.707_	_-1.240_
BEDS	0.416	0.160	0.173	0.091	-0.016	0.186	0.148
	_2.923_	_1.696_	_1.599_	_1.215_	_-0.25_	_2.516_	_2.103_
SCHED	0.853	0.266	1.116	-0.316	-1.252	-0.705	-0.787
	_0.590_	_0.277_	_-1.015_	_-0.368_	_-1.914_	_-0.955_	_-1.103_
DIED	0.053	0.018	0.016	-0.033	0.032	0.041	0.077
	_1.260_	_0.632_	_0.492_	_1.058_	_1.737_	_1.881_	_3.682_
EMPLOYEE_HHI (BY TYPE)	0.123	2.199	0.989	1.809	1.821	0.877	1.952
	_0.064_	_1.737_	_0.657_	_2.081_	_2.299_	_0.947_	_2.110_
HHI	-0.918	-1.160	2.437	-0.306	0.016	1.194	-0.559
	_-0.531_	_-1.022_	_1.804_	_-0.381_	_0.023_	_1.429_	_-0.651_
MEDICARE	4.557	2.129	4.696	-0.330	0.530	2.400	3.942
	_0.725_	_0.511_	_0.983_	_-0.100_	_-0.191_	_0.735_	_1.271_
MEDICAID	5.010	0.391	4.029	-0.700	-1.076	1.779	4.523
	_0.763_	_0.090_	_0.807_	_-0.201_	_-0.372_	_0.519_	_1.397_
OTHER	15.550	-1.451	11.303	13.850	1.514	15.495	16.440
	_0.957_	_-0.135_	_0.914_	_1.290_	_0.171_	_1.486_	_2.048_
GOVT	-4.832	4.961	1.729	-2.345	2.366	13.851	17.712
	_-0.595_	_0.921_	_0.280_	_-0.547_	_0.663_	_3.288_	_4.411_
HMO	5.253	1.780	5.246	-0.339	-1.063	2.963	3.687
	_0.816_	_0.417_	_1.072_	_-0.100_	_-0.374_	_0.887_	_1.160_
PRIVATE	7.523	0.508	3.166	-0.972	0.152	-0.027	3.027
	_1.015_	_0.103_	_0.562_	_-0.244_	_0.047_	_-0.007_	_0.827_
CHARITY	-13.861	-4.154	9.957	-3.787	11.876	-2.063	2.999
	_-0.569_	_-0.257_	_0.538_	_-0.295_	_1.12_	_-0.146_	_0.249_
SURG	6.977	2.300	5.154	3.340	5.001	3.945	2.056
	_2.608_	_1.296_	_2.533_	_2.286_	_4.059_	_2.649_	_1.557_
PER_CAP	0.335	0.271	0.379	0.195	0.273	0.220	0.226
	_4.952_	_6.104_	_7.437_	_5.524_	_9.36_	_6.430_	_6.835_
RETAIL_W	1.457	1.266	3.527	1.530	1.616	1.407	1.492
	_1.891_	_2.451_	_5.998_	_3.764_	_4.748_	_3.529_	_3.917_
POPN_DEN	-0.229	-0.217	-0.274	-0.144	-0.379	0.017	-0.374
	_-0.770_	_-1.109_	_-1.220_	_-0.928_	_-2.947_	_0.112_	_-2.571_
UE	0.166	0.155	0.209	0.079	0.063	0.005	0.030
	_1.857_	_2.616_	_3.078_	_1.668_	_1.61_	_-0.106_	_0.670_
TEACH	-0.144	0.027	0.139	-0.388	-1.003	-0.559	0.589
	_-0.247_	_0.070_	_0.313_	_-1.265_	_-0.397_	_-1.840_	_2.048_
SYSTEM	0.926	0.351	0.632	0.126	0.120	0.319	0.086

	1.887	1.080	1.695	0.486	0.561	1.266	0.352
NETWORK	-0.587	0.237	-0.318	-0.023	0.046	0.250	0.207
	-1.209	0.735	-0.860	-0.089	0.218	1.001	0.863
R^2	0.399	0.323	0.489	0.343	0.516	0.537	0.523
Adj. R^2	0.361	0.280	0.456	0.301	0.484	0.506	0.493

In principle, because the average wage is by definition grouped data (calculated from different numbers of employees across hospitals), one would normally weight observations by the square root of the number of hours worked. However, efforts to weight observations in this way increased rather than decreased the degree of heteroscedasticity in the model.

Table 1 : Distribution of Hospital Activity and Capacity by Ownership Type - 1996

	Percentage Distribution			
	Non-government Non-profit	**State and Local Government**	**For Profit**	**Total**
Hospitals	59%	26%	15%	5,134
Beds	69	18	13	862,352
Admissions	72	16	12	31,098,959
Inpatient Days	71	18	11	193,747,004

Source: American Hospital Association, AHA Hospital Statistics (1998), table 2.

Diagram 1
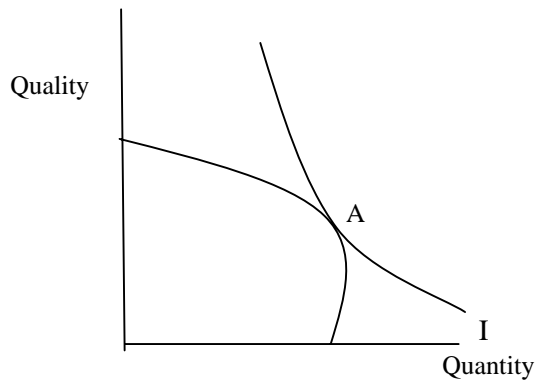
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