

**The Roles of Government and Nonprofit Suppliers  
in Mixed Industries**

**Kanika Kapur**  
Associate Economist, The Rand Corporation

**Burton A. Weisbrod**  
John Evans Professor of Economics  
and  
Faculty Fellow, Institute for Policy Research  
Northwestern University

Burton Weisbrod thanks the Andrew W. Mellon Foundation for support of his research on the economics of the nonprofit sector.

© 1999 by Burton A. Weisbrod. All rights reserved.

Kapur and Weisbrod

**The Roles of Government and Nonprofit Suppliers in Mixed Industries**

**Kanika Kapur and Burton A. Weisbrod\***

Revised December 25, 1998

**Abstract**

In what ways, if any, does the behavior of government and nonprofit organizations differ? This paper examines evidence from two industries--nursing homes and mentally handicapped facilities--to determine whether government and nonprofit organization behavior differs in identifiable dimensions, and if it does, why the differences occur. The two dimensions studied include consumer access, as measured by the use of waiting lists, and output quality, as measured by consumer satisfaction. Considerable differential behavior across the two institutional forms is found in both industries. The differences are consistent with varied models, one of which is that government and nonprofit providers have different objective functions, trading off quality and consumer access differently as government pursues a supplier-of-last-resort role.

## The Roles of Government and Nonprofit Suppliers in Mixed Industries

### I. Introduction

The effect of institutional form on organization behavior has been an active field of inquiry for both positive and normative reasons. In the light of growing “privatization” of government activities to both for-profit and nonprofit institutions, research on comparative institutional behavior is increasingly relevant. However, while there is extensive empirical work comparing behavior of nonprofit and for-profit institutions (e.g., in hospitals, Gray and McNerny, 1986, and Schlesinger, 1998; in nursing homes, Weisbrod and Schlesinger, 1986, Weisbrod 1998a; in day care centers, Kagan, 1991, Krashinsky, 1998, Mauser 1998), the comparison of governmental and private nonprofit institutions has received little attention.

At the theoretic level there has been even less research. One model presented earlier focuses on the inability of government to establish Lindahl prices for collective goods, perhaps being responsive to majoritarian demands. A consequence is governmental provision, in quantity or quality, that leaves some consumers undersatisfied—willing to pay more, at the margin, for additional collective-goods output or additional quality (Weisbrod 1975). The present paper, while principally empirical—seeking to identify patterns of differential performance—takes this prior perspective. Government suppliers—organizations owned by government and financed largely through taxation—are viewed as reflecting majoritarian demands for such collective goods as providing “basic” health services for all, regardless of ability to pay. Nonprofits, by contrast, are viewed as having objective functions exhibiting relatively less concern about full access compared to higher quality of services.

We examine the behavior of governmental and nonprofit organizations in two industries in which they coexist – nursing homes and facilities for the mentally handicapped. Both types of organizations are alike in being subject to the legal “nondistribution constraint,” which attenuates managers’ and directors’ property rights in organization profit, thereby affecting incentives (Hansmann, 1980). (For an analysis of differential behavior between nonprofit and for-profit organizations and each of two classes of private nonprofits – church related and other – in the same two industries, see Weisbrod, 1998a.)

Theory suggests a number of reasons why nonprofits and government suppliers might act differently despite the applicability of the nondistribution constraint to both. One view in public economics, as noted above, sees nonprofits as emerging from government failure in collective-good markets in societies with heterogeneous consumer demands (Weisbrod, 1975, 1988). Nonprofit organizations may respond to such undersatisfied demands, relying on voluntary donations of money and time, or on profit from sale of ancillary goods, to finance provision of additional collective goods (Weisbrod, 1998b, especially chapter 3). In this model nonprofit

organizations serve collective-good demands otherwise neglected by government; the two forms of organization occupy distinct but complementary market niches.

Nonprofits can thus be seen as providing additional quantity of collective goods, or different quality, or simply different goods as compared with what government provides. An illustration of a nonprofit's supplementation of governmental provision of a collective good is the action, in 1991, by the nonprofit Blue Cross/Blue Shield Association to finance research on the effectiveness of autologous bone marrow transplantation to treat breast cancer (Blue Cross and Blue Shield, 1991). The information produced by the clinical trials will be a collective good, available to all, not simply to Blue Cross/Blue Shield.<sup>1</sup>

A second view is that government delegates production to nonprofits due to certain real or pecuniary advantages of nonprofit production. That is, government may finance production performed by nonprofits. Nonprofits may be more flexible in their operations than government agencies, being less subject to rigid bureaucratic constraints (James and Rose-Ackerman, 1987, Smith and Lipsky, 1993, Frank and Salkever, 1994). Nonprofits may also face lower labor supply prices, including greater access to volunteer labor, insofar as people prefer working for, or volunteering to, a private nonprofit organization. The result of such differences is that nonprofits and governmental providers may differ in the ways they combine inputs. However, whether this leads to variation in output quality is another matter, given the difficulty of measuring output in the social services sector where nonprofits and governmental organizations are concentrated—e.g., higher education, medical care, museums and zoos (Weisbrod, 1998b).

A third viewpoint contends that at least some nonprofits are “for-profit firms in disguise.” With weak enforcement of legal constraints against managerial “inurement” -- distribution of profits to managers -- some profit-seeking entrepreneurs may be able to take advantage of public subsidies to nonprofits, turning them to private gain (Weisbrod, 1988). If legal constraints on government officials were effectively more restrictive, or less, the behavior of governmental and private nonprofit organizations would differ. Otherwise, behavior might be indistinguishable.

Theory, in short, is not strong enough to specify a confident prediction of whether governmental and nonprofit providers will or will not behave differently under each of a variety of conditions. A common thread among these three perspectives, however, is that government and private nonprofit institutions are related but may play somewhat distinct roles in the economy. Such different roles would translate into measurable differences in behavior in either input or output markets, or both.

To the extent that the two types of institutional forms have different objective functions—for example, with respect to the importance of providing collective goods such as basic research, or serving particular clientele such as the poor--or are subject to different resource constraints because of donations of money or time, we anticipate that their behavior will diverge. Such

divergence could occur even if government and nonprofits have the same objectives and face the same constraints, however, if they weigh the relative importance of multiple objectives differently. Both may pursue the objectives of access and quality, for example, but differ in the marginal rates of substitution.

We focus here on inter-institutional differences in (1) consumer access and in (2) output quality—especially in hard-to-monitor dimensions. Specifically, we investigate differences between comparable government and nonprofit institutions in consumer access, as proxied by the use of consumer waiting lists, and in output quality, as reflected by consumer satisfaction and, secondarily, labor input intensities.

In section II we describe the data from each of two surveys. Section III presents our main empirical results. A discussion and interpretation of the findings follows in section IV, in an attempt to advance toward more general model of government and nonprofit behavior.

## II. Data and Methodology

We control for a number of institutional and patient variables in multivariate analysis of behavior of government and nonprofit institutions in the two industries. The data are for two years, 1976 and 1987, which permits examination of the robustness of some results over time. The first data set is the Survey of Institutionalized Persons (SIP), a national survey of providers and recipients of long term care (U.S. Bureau of the Census 1976). The survey included random samples of facility administrators, staff members, residents, and residents' family members. The SIP data set is unparalleled in its richness; however, having being collected in 1976, these data may not reflect well the comparative institutional behavior in these industries in later years, when fiscal constraints changed. This is particularly likely in light of the important changes that have occurred in health care cost-containment efforts, the tightening of federal and state regulatory constraints, and shifts in such insurance-based incentives as expanded Medicaid market for nursing home care as the population has aged, and the expanded Medicare coverage for home health care – a substitute for institutional care.

The looser regulatory and insurance-finance constraints of the 1970s were, arguably, conducive to larger differences in institutional behavior than have occurred subsequently. Thus, as a second data source we use the institutional component of the 1987 National Medical Expenditure Survey (NMES) to replicate some of the work performed using the 1976 SIP data set. If the data for 1987 show smaller differences in institutional behavior than the data from 1976, that convergence would be consistent with growing regulation and changing market conditions that forced government and nonprofit firms to act more similarly. Our conceptual goal is to answer the question, What is the effect of institutional form on organization behavior, other things equal? The answer may well be a function of constraints on the other things; with

sufficiently tight budgetary constraints nonprofits and governmental (and, for that matter, for-profit) organizational behavior may be identical, whereas it could differ markedly if looser constraints provided more latitude for differential objective functions to be pursued.

Our search is for generalizable patterns of inter-institutional differences and similarities in behavior in industries where governmental and private nonprofit providers coexist. The two industries we examine differ in important ways. For example, they provide services to quite different populations, averaging 77 years of age in nursing homes but only 28 in facilities for the mentally handicapped. (Tables 1 and 2 provide descriptive statistics for each industry and institutional form.) Moreover, the governmental and nonprofit facilities are quite different in both industries—government facilities tend to be less numerous but both larger and older than their nonprofit counterparts.

We examine two dimensions of institutional behavior designed to measure differences in access and output quality at government and private nonprofit facilities: use of waiting lists and consumer satisfaction. While neither variable is free of interpretational ambiguities, both potentially provide evidence as to systematic performance differentials in outputs. An auxiliary indicator of performance, labor input intensities, is also examined.<sup>2</sup>

Differential maintenance of waiting lists highlights whether government and nonprofit suppliers ration access differently. An institution with an objective function that places greater weight on providing access to services, subject to a minimal quality constraint, would be less likely to utilize a waiting list than would an institution with an objective function emphasizing quality of care. The former type of organization, seeking to avoid restricting access, might reduce quality if necessary to sustain full access, assuming that the budget constraint is exogenous, unaffected in the process. We term this the “supplier of last resort” model, and hypothesize that it characterizes government. Nonprofits, by contrast, may be less willing to expand access at the cost of reduced quality, and in that case they would provide less access, instead maintaining waiting lists. If an institution were unwilling to deny access to anyone, it would have no waiting list at all, even if such a policy implied overcrowding and sacrifice of quality. A long term care facility might crowd three residents into a room designed for two; a soup kitchen might dilute the soup rather than turn anyone away (Steinberg and Weisbrod 1998).<sup>3</sup>

Consumer satisfaction is both an interesting indicator of overall output quality in multiple dimensions and an ambiguous measure reflecting unknown considerations. Recognizing its limitations, some of which are discussed below, we regard it as a useful companion to our waiting-list analysis, and it is used widely in the assessment of the outcomes of health care (Clancy and Eisenberg 1998). If, for example, consumers were less satisfied with the services at governmental facilities, we would expect less interest in being on a waiting list for such services. Similarly, if governmental facilities do serve the provider-of-last-resort role, diluting quality in the

process, then the greater access they provide would come at the cost of reduced quality, and so less consumer satisfaction would be anticipated. To be sure, however, standards and expectations may not be randomly distributed among consumers who end up with governmental and nonprofit facilities. While our measures are not ideal, both shed light on institutional behavioral patterns.

**Consumer satisfaction.** While consumer satisfaction is used commonly as an indicator of service quality, it should be interpreted cautiously. There has been little economic research on the forces generating reported consumer satisfaction (Devereux and Weisbrod 1996). Truthful responses may or may not be given. Satisfaction may or may not be a function of price and, relatedly, of deviations from expected quality. Dissatisfied consumers may have left the facility and switched to an alternative seller – a likely occurrence in many markets but not in the industries studied, where frail and handicapped patients face high costs of mobility. While the modeling of “satisfaction” deserves further attention, we interpret it as an indicator of output quality in the sense that having more satisfied consumers is socially preferred. In psychological research there are also “extremely few studies ... uncovering causal determinants of satisfaction” (Hall et al 1998, at 70). Given the great amount of survey information available about “satisfaction” with public and private institutions and services, more research and modeling of the process of satisfaction creation is overdue.

Satisfaction with services may be influenced by many factors in addition to quality of services and its relationship to price. For example, reported satisfaction may be greater at nonprofit facilities because people are truly more satisfied or because they are less likely to say that they are dissatisfied with facilities run by nonprofit, and particularly religious, authorities. Whatever the source of satisfaction may be, however, an organizational form that generates greater satisfaction is presumably producing socially-preferred services as compared with facilities generating less satisfaction – assuming that consumers are reasonably well-informed. We assume that consumers who are especially easy or hard to satisfy are randomly distributed among types of institutions, but that may or may not be valid.

Living in a long term care facility provides information to patients and family members about many attributes of output that are difficult to gauge a priori – particularly its provision of “tender loving care.” The longer the consumer's length of stay in a facility, the more he or she learns about attributes that were difficult to observe before entry. In the long term care industries under scrutiny, patient immobility limits switching to another provider even when information produces consumer dissatisfaction. Thus, unlike the case with most industries, consumer mobility (“exit”) from nursing homes and mentally handicapped facilities cannot be relied upon to leave all consumers “satisfied” (in the sense that they would not prefer to be in another facility). Thus, dissatisfaction may be observed as a disequilibrium but persistent condition, because of

the cost of switching. Our empirical measure of satisfaction is one obtained from family members, not from patients, who are typically disabled or infirm.

Medical and nursing input utilization is an alternative proxy, albeit imperfect, for quality of output. Additional inputs per patient would appear to imply better quality care, *ceteris paribus*. That would not be the case, however, if a selection process operated to bring the more severely disabled patients to governmental facilities. In that case, higher factor intensities would not necessarily imply higher output quality, conditional on illness severity.<sup>4</sup>

In addition, efficiency might differ between government and nonprofit suppliers, in which case greater use of inputs might not imply greater quality of output. The literature has already established the importance of controlling for differences in case severity. In a study of mental health services, for example, Schlesinger and Dorwart (1984) found that patients in public institutions were far more impaired than those in nonprofit institutions. Public facilities were found to treat more chronic, costly conditions, while nonprofits tended to handle disorders that respond to short term treatment. Government and nonprofit suppliers might also have systematically different consumer-patients for other reasons, such as location decisions or admission policies. Recognizing the limitations of labor input intensities as proxies for outputs, we nonetheless examine them across institutional forms.

To estimate the impact of institutional form on the behavior of mentally handicapped institutions and nursing homes we estimate several multivariate models with consumer satisfaction, use of waiting lists, and input utilization as dependent variables. In these models, we control for a number of institutional and patient variables. The data, covering two years, 1976 and 1987, permit some examination of the robustness of results over time. As noted earlier, behavioral differences reflect differences in both objective functions and constraints. Exogenous changes may have increased cost-containment pressures and, by enhancing competition, restricted opportunities for nonprofits to generate profit from patient services and cross-subsidize services to the poor or provision of other public goods. In such cases we should find changes over the 1976-1987 decade, with public and nonprofit sector behavior converging.

The 1976 data set is from the Survey of Institutionalized Persons (SIP), a national survey of providers and recipients of long term care (U.S. Bureau of the Census 1976). The survey included random samples of facility administrators, staff members, residents, and residents' family members. The SIP data set is unparalleled in its richness; however, having being collected in 1976, these data may not well reflect the comparative institutional behavior in these industries in later years. In addition to exogenous changes in private and public cost-containment efforts in health care, state Medicaid programs have expanded, Medicare extended its coverage for home health care -- a substitute for institutionalization -- and federal and state regulatory constraints tightened. The looser regulatory constraints of the 1970s were, arguably, conducive

to larger differences in institutional behavior than have occurred subsequently.

As a second data source we use the institutional component of the 1987 National Medical Expenditure Survey (NMES) to replicate some of the work performed using the 1976 SIP data set. If the data for 1987 show smaller differences in institutional behavior than the data from 1976, that convergence would be consistent with growing regulation and changing market conditions that forced government and nonprofit firms to act more similarly. These two, or other forms of ownership, may perform quite differently under certain conditions—constraints—but not under others.

### III. Empirical Findings

#### Differences in Access to Output: Waiting lists

We examine the use of waiting lists in the nursing home and mentally handicapped facilities industries to determine whether it differs systematically between government and nonprofit organizations. We begin by using a probit model to estimate the relationship between the dichotomous variable, whether a facility keeps a waiting list, and the facility's size (number of beds), age, proportion of beds certified for Medicare or Medicaid patients, and a dummy variable for nonprofit institutional form.<sup>5</sup> Size is controlled to account for its independent effect on the organization's sensitivity to shocks from demand. Facility age captures, in a rough way, quality of the physical capital, but also the reputation of the organization, both of which may influence consumer demand. Beds certified for Medicare and Medicaid patients proxy a facility's standards of quality of care.

A second model was estimated, in tobit form, to predict the length of a facility's waiting list (number of names), conditional on its having a waiting list.<sup>6</sup> We sought to explore whether inter-institutional differences in use of waiting lists are only in terms of having such a list, the length of the list if there is one, or both.

The results for the probit estimation, presented in table 3, show that the probability of having a waiting list does depend on institutional form, in both industries. Among mentally handicapped facilities in 1976, nonprofits were significantly more likely than government facilities to have a waiting list. The predicted likelihood of having a waiting list is 84 percent in nonprofits, but only 43 percent in government institutions. Our estimates for 1987 show that nonprofits serving the mentally handicapped continue to be significantly more likely to have a waiting list,<sup>7</sup> but the difference between the two types of institutions narrowed substantially over time. In 1987 we find that the likelihood of having a waiting list is 74 percent in nonprofits and 60 percent in government institutions. The likelihood fell for nonprofits and rose for government facilities, with the differential declining from 41 percentage points in 1976 to 14 percentage

Kapur and Weisbrod

points eleven years later.

In nursing homes, the 1976 data also show that nonprofits were significantly more likely to have a waiting list than government institutions; however, the predicted differential was considerably smaller in this industry -- only 11 percentage points. The 1987 data again show convergence, as they did for the mentally handicapped facilities. By 1987 there was no significant difference between nonprofits and government institutions in the predicted probability of having a waiting list.

Thus, the pattern in both industries shows that (1) government facilities have been less likely to ration access by using waiting lists, but (2) the greater use of waiting lists in nonprofit facilities relative to government facilities diminished greatly between 1976 and 1987. Governmental and nonprofit institutions became more alike in their use of waiting lists to distribute output.

The length of a waiting list, as measured by the number of names on it, is another proxy for access. While there is no information about the length of time people remained on a waiting list, and that may or may not be random with respect to ownership form, we explored the association of list length with whether an organization was governmental or private nonprofit. We estimated a tobit model restricted to those organizations that had a waiting list, with list length as the dependent variable. The results in table 3 show that institutional form has no apparent effect in either industry: In both mentally handicapped facilities and nursing homes, and in both 1976 and 1987, there is no significant effect of institutional form on waiting list length, conditional on having such a list. Thus, while we found, above, that institutional form is a significant variable explaining whether an organization maintains a waiting list, we now find that if an organization does maintain such a list, its expected length is independent of institutional form.<sup>8</sup> While governmental organizations are more likely to refrain from using a waiting list, those that do have one use it similarly--in the sense of the number of persons on the list--to that of nonprofits. It should be noted, however, that we do not have a structural model and cannot identify the effects of supply forces, reflecting organizations' desires to use waiting lists in pursuit of optimization of their objective functions, and of demand forces, consumers' desires to be on a particular organization's waiting list.

#### Differences in Output Quality: Consumer Satisfaction

If consumers of nonprofit facility services are more likely to be on waiting lists, that suggests that consumers prefer those services to their counterparts at government facilities. Thus, we analyzed a set of output indicators that measure consumer "satisfaction" with various elements of service, to see whether differential output performance was consistent with the observed behavior

in use of waiting lists to ration access. In both industries under study the immediate consumer (patient) is one whose capacity to judge quality of service is limited. Thus, we have examined indicators of satisfaction as reported by the patient's family member. The first of six indicators is the dichotomous response to the question, "Do you feel this facility has provided the kind of services and care [the resident] needs?" Family members were also asked whether they "like" or "don't like" each of five specific types of facilities and services provided to their relative: buildings and grounds, rooms and furnishings, staff, treatment facilities, and social activities. A third response, "don't know/ no opinion," was also available for this set of five questions.

Probit equations were estimated for each of the six indicators of satisfaction. A binary probit model was estimated for the dichotomous response variable, and an ordered probit was estimated for the trichotomous response variables with "don't know/ no opinion" being treated as intermediate between the other two responses. The explanatory variables are (a) the patient's length of stay (LOS) in the facility – where LOS reflects the opportunity for the family member to acquire information; (b) the average charge per patient per month in that facility as reported by its administration – on the assumption that expectations of service quality may depend on the charge;<sup>9</sup> (c) age of the facility, which may affect its reputation; (d) age of the patient, which may influence the standards used by family members to measure performance and, hence, satisfaction (Hall et al, 1998); and (e) a dummy variable for institutional form.

Our primary interest is with the effect of institutional form. The 1976 SIP data were used to estimate the satisfaction equations, for the 1987 NMES data did not have consumer satisfaction measures. The estimates reported in table 5 show the probability of the consumer/family member saying that he or she "likes" each type of service or facility, as well as the overall rating. For mentally handicapped facilities the estimates of the satisfaction equations show that satisfaction is greater at nonprofits by all six measures, significantly so for three – rooms and furnishings, staff, and social activities. Magnitudes of differences, however, are modest. Estimated satisfaction with staff, for example, was 77 percent in nonprofit institutions compared with 68 percent in government institutions.

It is noteworthy that differential satisfaction with the treatment services at mentally handicapped facilities, while favoring nonprofits, was not significant; arguably this variable is particularly important to patient care. What consumers appear to prefer about nonprofits over government facilities is not the "basic" medical care but the less-central attributes. This is consistent with the model of government as provider-of-last-resort, providing basic services.

Further analysis discloses that there is systematic variation within the nonprofit sector. When nonprofits are disaggregated into church-related nonprofits and other nonprofits, we find that the dummy variable on church-related nonprofits is positive and significant for four of the six measures. However, the "other nonprofit" dummy, while positive, is always

insignificant. Thus, the results in table 5, on the nonprofit dummy, appear to be driven by the church-related nonprofits. (Such heterogeneity within the nonprofit sector has been reported by Weisbrod 1988 and 1998a.)

In nursing homes, the pattern is similar and even more striking. Of the six measures of consumer satisfaction in table 5, five favor nonprofit facilities, with four of them being statistically significant. The measures that were found significant for the mentally handicapped industry were, again, rooms, staff, and social activities, but in addition, treatment services.<sup>10</sup> Estimated satisfaction with staff, for example, is 71 percent at nonprofits, 59 percent at government facilities. The greater satisfaction with treatment services suggests that consumers prefer what they receive at nonprofit facilities over government facilities in many dimensions.

These findings are similar for the two industries: (1) In both industries, every significant difference favors nonprofits. (2) In both industries significantly higher satisfaction was estimated for nonprofits' in at least three dimensions--rooms and furnishings, staff, and social activities. (3) In both industries there were no significant differences in overall satisfaction or in satisfaction with buildings and grounds. (4) The magnitudes of differential satisfaction across institutional forms were also quite similar; the significant differences were 9-13 percentage points at mentally handicapped facilities, and 11-15 percentage points at nursing homes.

While these results are consistent with higher output quality in nonprofit institutions, they may also be driven by heterogeneous patient preferences in different institutions. As a specification check we included several control variables for patient preferences in the estimation. To control for possible sorting of patients, the satisfaction equations were re-estimated controlling for patient race, sex and marital status, and the reason the patient selected the current facility--whether because of its location, because it provided care at low or no cost, or whether ability-to-pay was an admission criterion at the facility. An additional control variable measuring the functional status of the patient was included to account for the possible effect of differential case mix on satisfaction. The results on the institutional form dummy (not shown), however, were very similar to those estimated without controlling for such patient selection. The generally higher satisfaction at nonprofit facilities, and the absence of a significantly higher indication of overall satisfaction in either industry is robust to this specification check.

It remains true, however, that the process of producing "satisfaction" remains poorly understood, as we noted above, and more research is needed to facilitate interpretation of satisfaction data. At the same time, there is some face validity to the interpretation of greater satisfaction as a desirable trait reflecting quality of care. As one recent paper put it, "... quality of care should ... increase the likelihood of patient satisfaction" (Palmer and Chapman, 1997, at 1; see also 35-37).

### Differences in Labor Input Utilization

In light of uncertainty regarding the appropriate interpretation of consumer satisfaction data, we examined another performance indicator—labor input intensities. Inputs are, of course, an indirect and uncertain measure of outputs, since utilizing more inputs per patient does not necessarily imply higher quality output. Greater quantities of inputs could be offset by unmeasured differences in input quality, efficiency of utilization, or patient case severity.

We examined labor input intensities -- numbers of workers per 100 beds in the facility -- as potential indicators of output quality. Specifically, we report our findings about key medical inputs in both industries—M.D.s. and each of three skill-levels of nurses, Registered Nurses (RNs), Licensed Practical Nurses (LPNs), and nurse aides. Only the number of persons of each type is known, not their quality. However, we can distinguish full-time from part-time workers.

Regressions of the determinants of these medical labor inputs were estimated in tobit form because of the zero limit value of inputs. The dependent variable in each regression equation is the number of each type of worker – for example, full time RNs (FTRN) – per 100 patient beds in the particular facility.<sup>11</sup> Right-hand-side variables and the rationale for their inclusion include the following characteristics of each facility: (1) size (number of beds) – to account for scale economies or diseconomies;<sup>12</sup> (2) age – to allow for greater labor input requirements for older capital; (3) average charge per month – to account for its effect on revenue per patient and thereby on input purchases;<sup>13</sup> (4) proportion of beds certified for Medicare and Medicaid patients, including the distinction between Medicaid “skilled-care” and “intermediate-care” beds – to account for potentially differential organizational behavior toward patients who were being financed publicly, and for the greater input needs of patients occupying such beds; (5) proxies for the severity of patient infirmities at the facility – to control for differential case mix; and (6) a dummy variable indicating the ownership form of the institution. (Data on capital inputs are unavailable, and the only proxy for real capital input, the age of the facility, is weak.<sup>14</sup>)

The patient case mix severity regressors were defined as the mean values of “functional status” variables for the patients in a given facility. Specifically, the functional status variables denoted whether a patient was “totally dependent” on help for each of six activities: eating, drinking, bathing, dressing, walking, or using the toilet.<sup>15</sup> For each facility the mean number of such limitations per patient was the score used. An additional dummy variable for whether or not the patient suffered from a medical condition was also created. We found that government institutions do indeed have a higher proportion of functionally impaired patients, by these measures. The impairment indicator is problematic, however, in that it fails to reflect degrees of dependency short of “total,” and it is based on a small sample of patients at each facility—typically

4-6; moreover, the mean number of impairments may mask differential variance in governmental and nonprofit facilities.

Table 6 shows the estimated inter-institutional differences in medical inputs for both 1976 and 1987, for medical doctor and each of three types of nurses, full time and part time, using the six types of regressors noted above.<sup>16</sup> Turning first to mentally handicapped facilities (top panel), we see that the 1976 estimates show substantially and significantly higher predicted input intensities in government facilities for all four full-time medical input groups. Governmental facilities have, for example, an estimated 8.07 FTRNs per 100 beds, compared with 2.62 for nonprofit facilities, and similarly greater intensities for practical nurses (FTLPN) and nurse aides. These differences were not offset by differential use of part-time labor.

The 1986 data show, again, a marked narrowing of differences between governmental and nonprofit facilities.<sup>17</sup> For each of the full-time medical inputs, the greater values for governmental facilities remained, but the ratios of predicted values in the two types of organizations narrowed. Moreover, sizable offsets emerged, as nonprofits came to use significantly more part-time inputs than did governmental facilities.<sup>18</sup> (The sharp increase in use of relatively unskilled nurse aides in both types of organizations is especially noteworthy, but pursuing this is beyond the scope of this paper.)

The higher labor input intensities at government institutions could be due to greater medical “needs” that are not fully captured by our functional status measures. As we noted above, our functional status measures are limited both by being based on dichotomous variables indicating whether patients are, or are not, “totally dependent” on help for various functions -- measures that fail to distinguish degrees of dependency -- and by being based on small samples of patients in each facility—typically only 4-6 patients. In addition, we cannot determine whether the higher input intensities at government facilities reflect inefficiency (Frech and Ginsburg, 1981) rather than higher quality care, and whether the quality of the labor is lower at government facilities. Our findings that patients are more satisfied with nonprofit facilities, despite the fewer labor inputs, suggests that these inputs are not measuring output quality well, as that is seen by family member respondents. With respect to the possible differential quality of inputs, other research in progress, by Weisbrod, on a related industry, hospitals, in California in 1993, has found that quality of nurse inputs, as reflected by wage rates, is some 15 percent lower at public than at nonprofit facilities. The mean hourly wage paid each type of nurse is significantly lower at public than at nonprofit hospitals; for LPNs, for example, it was \$7.86 at public hospitals and \$9.29 at church-related nonprofits, controlling for size of facility.

Over the 1976-1987 interval we find major changes (table 6). While governmental facilities for the mentally handicapped continued to utilize relatively more full-time compared

to part-time labor inputs than did nonprofits, the differential narrowed materially. In addition, both nonprofit and governmental facilities in this industry shifted the relative mix among FT inputs, sharply increasing usage of relatively low-skilled, but low-wage, aides, compared to the more-skilled but higher wage nurses and physicians. In the nursing home industry we find little difference in input intensities between nonprofit and governmental facilities in either year. Unlike our findings for mentally handicapped facilities, there is no systematic pattern of differential utilization of labor inputs between government and nonprofit nursing homes, when case mix is controlled using the functional status variables discussed earlier.<sup>19</sup> As with the mentally handicapped industry we find that input utilization increased in both sectors.

#### IV. Discussion

While it was not clear a priori whether we would observe differences in access and output quality between government and nonprofit institutions, a number of interesting findings have emerged: (1) Government facilities use waiting lists less than nonprofits. This was found for both the mentally handicapped and nursing home industries, and in both 1976 and 1987-- although the difference was not significant for the nursing home industry in 1987. (2) For the subset of facilities that do utilize waiting lists, there was no significant difference in the predicted lengths of the waiting lists at governmental and nonprofit facilities in either industry. (3) Consumer satisfaction is generally, and often significantly, greater at nonprofits than at government facilities in both industries. (4) The higher reported satisfaction with nonprofits occurs despite the fact that they do not use more medical and nursing labor inputs per patient, and, indeed, they use fewer such inputs in the mentally handicapped industry.

We now explore briefly the forces underlying and generating the pattern of differences and similarities found between governmental and nonprofit facilities in the two industries. We do not propose a formal model, but discuss a number of potential explanations that are consistent with our findings.

It is natural to frame any organization's decisions in terms of maximizing an objective function subject to constraints. In this context, differences in behavior between government and nonprofit organizations can be attributed to differences in constraints, objective functions, or both.

##### Differences in Constraints

As we pointed out above, nonprofit and government organizations share a constraint that distinguishes both from private firms – the nondistribution constraint which restricts the right to pay out any organization profit to managers or directors. Managerial incentives to maximize profit, as a result, may be attenuated (Alchian and Demsetz, 1972). While the nondistribution

constraint may well be important for understanding differential behavior of private firms relative to both government and nonprofit suppliers, its applicability to both of the latter suggests that any differential behavior between them, such as we have found, is a consequence of other differences in either constraints, such as civil service rules growing out of the political process, or in objective functions.

Governmental and private nonprofit organizations may differ, however, in terms of other constraints. Access to capital is one. While neither has access to equity capital, owing to the nondistribution constraint, government has access to tax revenue, while nonprofits do not, and this difference could lead to such consequences as higher capital-labor ratios at governmental facilities, because of the lower apparent cost of capital, or to less technical efficiency among governmental suppliers because the budget constraint is softer. Nonprofits, on the other hand, appear to have greater access to volunteer labor, and insofar as it can substitute for paid labor, this may lead to less use of paid labor (which we have found) but greater overall use of labor. Less restrictive capital constraints for governmental facilities are consistent with our observations of the lesser usage of waiting lists; and lower efficiency at governmental facilities is consistent with our findings of their greater labor-input intensities, after adjusting for case-severity, and of less consumer satisfaction.

Differential constraints, including those flowing from the political process, may generate a systematic sorting of patients, which can have further effects. If, for example, governmental facilities in health care, such as the two industries studied here, serve disproportionately infirm patients, as we have found, this could explain the lower level of consumer satisfaction at government facilities. Such a negative relationship between illness-severity and consumer satisfaction has been found in prior research in psychology: Patients in poorer health tend to be less satisfied with their medical care. In a number of regression models it has been found that “better health had a positive direct association with satisfaction” (Hall et al 1998, at 71). Sicker patients tend to blame their care givers.

#### Differences in Objective Functions

Differing objective functions are another potential source of differential organization behavior. The supplier-of-last-resort model of government may be viewed either as a constraint affecting governmental and nonprofit providers differentially, or as constituting a difference in goals. While this model has not been explored in depth, its plausibility is suggested by a variety of casual observations: In the U.S. hospital sector, for example, it is common for county and municipal government hospitals to be the principal providers of health services for the poor and uninsured, who have difficulty obtaining services elsewhere. New York City's public hospitals reportedly “care for people who are not welcome at other hospitals” (Brier 1997), and public

hospitals are often required to provide medical care to the indigent, “whether they have insurance or not, and regardless of whether they qualify for Medicaid or are illegal aliens” (Verghese 1996). Public agencies often are mandated to provide services to persons who are deemed “deserving” but are not otherwise served, perhaps because they are particularly costly to serve and are neither able to afford the private market nor are acceptable to nonprofit organizations. An example is nursing home care for patients who are abusive or disruptive. And in higher education it is common for government community colleges to be available to all, or virtually all, high school graduates at little or no fee, while “private” nonprofit colleges are more selective. Similarly, public parks typically charge little or no admission fees, reflecting the goal of providing access to all, even at the price of congestion.

In short, a hypothesis we believe merits further testing is that the objective function for government institutions includes making services available to all individuals, regardless of their ability to pay, and subject to a minimum-quality constraint that is below what nonprofit providers offer. Our finding that government facilities are less likely than nonprofits to maintain a waiting list is consistent with such a supplier-of-last-resort (SLR) objective function, as is our finding that consumers are less satisfied with the services of government facilities.

This view of the government's role as SLR is consistent with a variety of other research evidence: In the nursing home and mentally handicapped facilities industries, when family members of patients were surveyed regarding why they chose a particular facility, significantly more of them reported that they chose government rather than nonprofit care because of waived or reduced charges for care (Authors' calculations using the Survey of Institutionalized Persons, 1976). In hospitals and psychiatric care facilities, government institutions are less likely than nonprofit institutions to limit care for uninsured patients (Gray and McNerney, 1986; Schlesinger et. al, 1987; Marmor et. al., 1987 ). At universities, lower tuition and easier access at public institutions, as compared with private nonprofit institutions, is well known.<sup>20</sup>

Our analysis of output quality differentials produced mixed results. On one hand, using the proxy, satisfaction, we found that in both industries it was as great or greater at nonprofit institutions as at government facilities, using six different measures. We noted earlier that there are a number of plausible explanations for the differential satisfaction, with differing interpretations. Individuals may self-select into one type of institution or the other, their decisions reflecting heterogeneous preferences, and persons selecting nonprofits may be more easily satisfied, particularly with church-related facilities. Such selection bias may also occur because governmental and private nonprofit facilities chose to occupy different market niches, and these generate differing degrees of difficulty in satisfying consumers. Finally, satisfaction may be higher at nonprofit institutions because these facilities actually do provide higher quality care and greater attentiveness to consumer wants, for given prices, than do their government counterparts. That

would be possible, for example, insofar as nonprofits had lower production costs resulting from higher levels of volunteer labor, or if their objective functions placed more emphasis on satisfying consumers than do the objective functions of government facilities. Our finding that nonprofits are more likely to maintain a waiting list appears to suggest, though it surely does not prove, that the greater satisfaction with nonprofits is not illusory but reflects better quality of services.

Our examination of an indirect proxy for output quality, labor input intensities, however, shows that nonprofits do not provide more medical care resources per patient. Depending on the industry and the year, we find either little difference between governmental and nonprofit facilities in terms of their medical-care labor intensities, or greater intensities at government facilities. A number of interpretations are plausible, including incomplete measurement of differential case severities of patients, lower quality of inputs at governmental facilities—that is, substituting quantity for quality of inputs—and differential efficiency in converting inputs into outputs, as well as higher quality at government facilities. The latter explanation, however, is inconsistent with our finding of significantly greater use of waiting lists at nonprofit facilities.

## V. Conclusion

Research on the comparative behavior of governmental and private nonprofit providers is in its infancy. We have examined behavior in two dimensions—access to service, as measured by the use of waiting lists, and quality of service, as measured by consumer satisfaction. An indirect measure of quality, labor input intensities, was also studied. A number of systematic differences in both the nursing home and mentally handicapped facilities industries were found. While our principal goal was to examine empirical evidence, we also explored the nature of behavioral models that are consistent with our observations.

In particular, we suggest that government be modeled as a “supplier of last resort” (SLR), while nonprofits be seen as more willing to trade-off serving all consumers in order to sustain quality of output. This model of objective functions that reflect differential marginal rates of substitution between access and quality is neither developed nor tested rigorously in this paper, but it merits further development as attempts go forward to understand the relationship between governmental and nonprofit sector activities. We find that government facilities are significantly less likely to maintain a waiting list and, in that sense, they restrict access less than do nonprofits. Second, we find that consumers—more precisely patients’ family members—are less satisfied with government facilities, which is consistent with their provision of lower quality, even relative to price paid. In turn, the lower consumer satisfaction is consistent with the lesser usage of waiting lists at governmental facilities. Thus, both are consistent with a governmental objective function that emphasizes consumer access.

Further development of the SLR model of government behavior should address the

Kapur and Weisbrod

question of how the political process determines the budget constraint on government facilities. Even if governmental facilities do have more-complex cases, that would not imply greater factor intensities, depending on the budget.

Our findings that government facilities are less likely to have waiting lists, and that consumer satisfaction is lower at government facilities suggest that their greater labor input intensities do not reflect higher quality services. **Nonprofits' services are preferred to those at government facilities, despite the higher input intensities at government facilities.** The evidence, however, of systematically different labor inputs at public and nonprofit facilities provides tantalizing information relevant to the continued search for understanding of the roles of public and nonprofit service providers in mixed industries.

Our empirical focus has uncovered a pattern of differential behavior in two industries in the United States. This work suggests that it would be useful to study other industries where public and nonprofit suppliers coexist--for example, in higher education, hospitals, and employment services--as well as in other countries.

References

- Alchian, Armen, and Harold Demsetz, "Production, Information Costs, and Economic Organization," *American Economic Review* 62 (December 1972), 777-795.
- Alvarez, Lizette. "Turning Away the Homeless Is Made Harder in New York," *New York Times*, November 28, 1996, B12.
- Badelt, Christoph and Peter Weiss. "Specialization, Product Differentiation and Ownership Structures in Personal Social Services: the Case of Nursery Schools," *Kyklos*, Fasc.1 (1990), 61-81.
- Blue Cross and Blue Shield Association. "Statement of Purpose, Clinical Trials of Autologous Bone Marrow Transplantation with High Dose Chemotherapy for Patients with Advanced or Poor Prognosis Breast Cancer" (April 1991).
- Brier, Pamela S. "At Risk: Health Care for the Poor," *New York Times*, January 18, 1997, A21.
- Clancy, Carolyn M. and John M. Eisenberg. "Outcomes Research: Measuring the End Results of Health Care," *Science* 282, October 9, 1998: 245-246.
- Devereux, Paul J. and Burton A. Weisbrod. "Complaints and Geographic Mobility as Responses to Dissatisfaction with Public Services," Working paper, Department of Economics, Northwestern University, 1996.
- Dorwart, Robert, Mark Schlesinger, Harriet Davidson, Sherrie Epstein and Claudia Hoover, "A National Study of Psychiatric Hospital Care," *American Journal of Psychiatry* 148:2, February, 1991, 204-210.
- Frank, Richard and David Salkever, "Nonprofit Organizations in the Health Sector," *Journal of Economic Perspectives*, Vol. 8, no. 4, Fall 1994, 129-144.
- Frech III, H.E. and Paul B. Ginsburg, "The Cost of Nursing Home Care in the United States: Government Financing, Ownership, and Efficiency," in *Health Economics. and Health Economics*, ed. J. van der Gaag and M. Perlman (\_\_\_\_\_, 1981).

Gray, B. H and W.F. McNerney, "For-profit Enterprise in Health Care," *New England Journal of Medicine*, 1986, vol. 314, 1523-1528.

Hall, Judith A., Michael A. Milburn, Debra L. Roter, and Lawren H. Daltroy, "Why Are Sicker Patients Less Satisfied With Their Medical Care? Tests of Two Explanatory Models," *Health Psychology*, 1998, vol. 17 (1), 70-75.

Hansmann, Henry. "The Role of Nonprofit Enterprise," *Yale Law Review* 89 (April 1980), 835-899.

Kagan, Sharon, "Examining Profit and Nonprofit Child Care: An Odyssey of Quality and Auspices," *Journal of Social Issues* 47 (1991), 87-104.

Krashinsky, Michael, "Does Auspice Matter? The Case of Day Care for Children in Canada." in Walter W. Powell and Elizabeth S. Clemens, eds. *Private Action and the Public Good* (New Haven, CT: Yale University Press, 1998), 114-123.

Marmor, Theodore, Mark Schlesinger and Richard Smithey, "A New Look at Nonprofits: Health Care Policy in a Competitive Age," *Yale Journal on Regulation*, 1987, vol. 3, 313-349.

Mauser, Elizabeth, "The Importance of Organizational Form: Parent Perceptions versus Reality in the Day Care Industry," in Walter W. Powell and Elizabeth S. Clemens, eds. *Private Action and the Public Good* (New Haven, CT: Yale University Press, 1998), 124-133.

Newhouse, Joseph, "Toward a Theory of Non-Profit Institutions," *American Economic Review* 63, 1970, 64-74.

Palmer, R. Heather, and Richard H. Chapman, "Quality of Care for Medicare Beneficiaries: Implications of Changing Health Care Financing Mechanisms," Washington, DC: Public Policy Institute. AARP, Working Paper 9703, May 1997.

Schlesinger, Mark, "Mismeasuring the Consequences of Ownership: External Influences and the Comparative Performance of Public, For-Profit, and Private Nonprofit Organizations," in Walter W. Powell and Elizabeth S. Clemens, eds. *Private Action and the Public Good*

Kapur and Weisbrod

(New Haven, CT: Yale University Press, 1998, 85-113).

Schlesinger, Mark, J. Bentkover, D. Blumenthal, "The Privatization of Health Care and Physicians' Perceptions of Access to Hospital Services," *Millbank Quarterly*, 1987, vol. 65, 25-58.

Schlesinger, Mark and Robert Dorwart, "Ownership and Mental-Health Services: A Reappraisal," *New England Journal of Medicine*, vol. 311, no. 15, 1984, 959-965.

Smith, Stephen Rathgeb and Michael Lipsky, *Nonprofits for Hire* (Cambridge, MA: Harvard University Press, 1993).

Steinberg, Richard, and Burton A. Weisbrod, "Pricing and Rationing by Nonprofit Organizations With Distributional Objectives," in Weisbrod 1998b, 65--82.

U.S. Bureau of Census, *1976 Survey of Institutionalized Persons. Current Population Reports: Special Studies: Series P-23, No. 69.*

U.S. Department of Health and Human Services, Agency for Health Care and Policy Research. *National Medical Expenditure Survey, 1987: Institutional Population Component, Phase 1 [Public Use Tape 2]*, Rockville, MD.

Verghese, Abraham. "My Hospital, Dying a Slow Death," *New York Times*, November 30, 1996, 19.

Weisbrod, Burton A., "Towards a Theory of the Voluntary Nonprofit Sector in a Three Sector Economy," in *Altruism. Morality and Economic Theory*, ed. E. Phelps, 1975, 171-195.

Weisbrod, Burton A., *The Nonprofit Economy* (Cambridge, MA: Harvard University Press, 1988).

Weisbrod, Burton A., "Institutional Form and Organization Behavior," in Walter W. Powell and Elizabeth S. Clemens, eds. *Private Action and the Public Good* (New Haven, CT: Yale University Press, 1998, 69-84) (1998a).

Weisbrod, Burton A., ed. *To Profit or Not to Profit* (New York: Cambridge University Press,

Kapur and Weisbrod

1998) (1998b)

Weisbrod, Burton A. and Mark Schlesinger. "Ownership and Regulation in Markets with Asymmetric Information: Theory and Empirical Application to the Nursing Home Industry," in Susan Rose-Ackerman, ed. *The Economics of Nonprofit Institutions* (New York: Oxford University Press, 1986), 133-151.

Notes

<sup>1</sup> In work now in progress, Weisbrod is examining differential behavior of public, nonprofit, and for-profit hospitals in the provision of three forms of collective goods—research, education, and indigent care.

<sup>2</sup> The SIP data, but not the NMES data, permit disaggregation of nonprofits into church-related and other nonprofits. Weisbrod (1988, 1998a) shows that important differences exist between the two types of nonprofits.

<sup>3</sup> Differential pricing—another mechanism for rationing access—also deserves attention. However, available data provide information only about “charges,” which amount to “list” prices and may bear little relationship to actual prices paid, particularly at public facilities. Public hospitals, nursing homes, etc. may well have higher charges but lower actual prices received than do nonprofits. Charges might be set higher by a facility that handles patients more of whom are expected to be unable to pay, with prices being set higher for those who do pay. While such behavior would be nonoptimal for a profit maximizer, it could be optimal for an organization having a more complex objective function.

More research is needed on the extent to which providers of various forms make differential use of price discrimination in pursuit of their distributional goals. While discrimination may generate added revenue, its use under conditions of imperfect information and transactions costs can lead to pricing “deserving” consumers out of the market. Thus, for a government institution it may be optimal, in the second-best sense, to charge a low, or even zero, uniform price to all; this could help to explain the historic policy of charging little or no tuition at public universities rather than adopting the policies of private (nonprofit) universities and colleges, which engage in more price discrimination by setting higher tuition prices and then giving financial aid.

<sup>4</sup> There are additional possible differences across institutional forms. For example, the quality of inputs could differ systematically.

<sup>5</sup> The facility’s price or “charge” was not used as a regressor because we seek to determine whether there is differential use of waiting lists even when price is free to vary. Regression results with charges included were also estimated, however the resulting estimates were trivially different.

<sup>6</sup> We would prefer to measure the time spent on the waiting list until care is provided to measure access to treatment. This variable is not available, hence, the presence of a waiting list and the number of names on it serve as proxies for time spent on the waiting list.

<sup>7</sup> The NMES (1987) data did not include age of the facility. Hence, we were unable to control for this variable in the probit equation for the probability of having a waiting list. Given that this variable does not have a large effect in the SIP estimation, its absence is unlikely to bias the coefficient on the nonprofit dummy variable.

**8.** We have also examined inter-institutional differences in prices, to see whether rationing access through waiting lists was mirrored in price differentials—in particular, whether nonprofits, which we found to make greater use of waiting lists, also charged lower prices. An institution can control access through both mechanisms. Available data on “prices,” however, are limited to “charges,” which are essentially list prices rather than transactions prices. We estimated differences in charges between nonprofit and governmental institutions in each of our two industries, controlling for facility size and quality of service, as proxied by the proportion of its beds that are certified for Medicare and for Medicaid (skilled and intermediate) patients, and average cost per patient month. Since we regard the price variable as differentially biased for the two institutional sectors—government facilities likely having a higher ratio of charges to actual prices, we do not show the results. For mentally handicapped facilities, the coefficient on the nonprofit dummy variable is positive and significant, implying that, other things equal, charges at nonprofits were some \$240/month higher than at government facilities—equivalent to 76 percent of the industry median charge. For nursing homes, estimated charges did not vary significantly across institutional form. Data to replicate this analysis for 1987 were not available in the NMES.

<sup>9</sup> In an alternative formulation the average cost per patient month was also included in the estimation. This was intended to control for differences in revenue per patient, particularly revenue in the form of donations, which are unlikely to be captured by the facility’s average charge. This revised estimation gave very similar results to those reported in this paper.

<sup>10</sup> The “overall satisfaction” measure has a negative, though insignificant, coefficient on the nonprofit dummy. However, when this is disaggregated to church-related and other nonprofits, the dummy on church-related nonprofits is positive, whereas the dummy on other nonprofits is negative; neither coefficient, however, is significant. The “other nonprofit” dummy is positive and significant only in the satisfaction with rooms and

furnishings equation.

<sup>11</sup> Data on occupancy rates were not available. While the possibility exists that there are systematic inter-institutional differences in occupancy rates, this seems unlikely in light of the generally high level of capacity utilization, especially in the nursing home industry, where state government constraints on facility construction ("Certificate of Need" legislation) have been common.

<sup>12</sup> The reduced-form equations for both industries treat the characteristics of individual organizations (their size, age, Medicaid mix, charges, etc.) as exogenous to their choice of institutional form. However, some of these variables are endogenous, themselves being results, partially or fully, of institutional form (Weisbrod and Mauser, 1991).

<sup>13</sup> As with the consumer satisfaction estimation, average cost per patient month was also used as an alternative proxy for revenue. The results from this estimation are similar to those reported in the paper.

<sup>14</sup> Thus, the examination of differential labor input utilization among the two forms of institutions cannot preclude the possibilities that institutions substitute differently between either quantity and unmeasured quality of labor, or between labor and unmeasured capital.

<sup>15</sup> Functional status is calculated for the facility by averaging the status of the sampled patients in that facility. The number of patients sampled in a facility ranged from a 1 to 30, with a mean of 10. In the estimation, the unequal sample size was accounted for by weighting by the square root of the number of sampled patients in the facility. The estimation could be improved if the proxies for case mix were an average of all patients in the facility. However, functional status data may be inadequate proxies for the severity of the case mix.

<sup>16</sup> A similar pattern is found for the other 16 full time and 16 part time paid labor inputs, that is, in general government organizations have significantly higher input intensities. The magnitude of these differences is especially large for full time inputs. These are not reported here in the interest of brevity, but are available upon request.

<sup>17</sup> Estimates not presented show that excluding functional status measures from the estimation had little to no effect on the estimated differentials between nonprofit and government input utilization, which was also the case for 1976.

<sup>18</sup> Government facilities have more-impaired patients (data not shown), and so the inclusion of the case-mix variables in the estimating equation consistently narrowed the estimated higher input levels of government facilities; however, as table 6 shows, it did not eliminate them. For example, if the case mix severity variable were excluded, the coefficient on the nonprofit dummy for the FTLPN equation would have been considerably greater in absolute magnitude -- not -22.7 (table 6, column 1), but -34.8 (not shown in the table). Our case-mix variable narrows the differentials in input intensities but does not eliminate them.

<sup>19</sup>

Again, as with mentally handicapped facilities, exclusion of the case-mix variables resulted in estimates of greater labor input utilization at governmental facilities relative to nonprofits -- results not shown.

<sup>20</sup> While generalizing about government providers may be useful, it should be noted that government may choose to occupy more than one market niche. Thus, while governments in the U.S. provide access to some level of higher education to all, or virtually all, high school graduates, any particular government facility may restrict access to an elite group--e.g., the University of California-Berkeley.

**Table 1 : Means of Variables - Mentally Handicapped Facilities, 1976 and 1987**

Variable	Label	1976 (SIP)		1987 (NMES)	
		Nonprofit	Govt.	Nonprofit	Govt.
SIZE	Institution Size (Beds)	102.5	411.8	37.4	336.7
AGE	Institution Age (Years)	24.1	33.4	-	-
CHARGES	Monthly Charge per Patient (Dollars)	533.8	541.1	-	-
WAIT LIST	Proportion having a waiting list	0.8	0.5	0.7	0.6
LIST LENGTH	Number of persons on waiting list	24.0	106.4	31.06	19.0
N	Number of Facilities	61	48	204	175

Source: Survey of Institutionalized Persons, 1976 (SIP) and National Medical Expenditure Survey, 1987 (NMES).

Note: The variables AGE and CHARGES are not present in the NMES data.

**Table 2 : Means of Variables - Nursing Homes, 1976 and 1987**

Variable	Label	1976 (SIP)		1987 (NMES)	
		Nonprofit	Govt.	Nonprofit	Govt.
SIZE	Institution Size (Beds)	152.5	302.2	145.3	288.6
AGE	Institution Age (Years)	29.8	42.1	-	-
CHARGES	Monthly Charge per Patient (Dollars)	619.9	597.7	-	-
WAIT LIST	Proportion having a waiting list	0.9	0.7	0.7	0.7
LIST LENGTH	Number of persons on waiting list	26.5	86.9	27.1	29.0
N	Number of Facilities	62	37	160	61

Source: Survey of Institutionalized Persons, 1976 (SIP) and National Medical Expenditure Survey, 1987 (NMES).

Note: The variables AGE and CHARGES are not present in the NMES data.

Table 3: Waiting List Probit and Waiting List Length Tobit Estimates by Industry, 1976 and 1987

Dependent Variable	Coefficient on Nonprofit	1976 (SIP)		Coefficient on Nonprofit	1987 (NMES)	
		Predicted Value at Nonprofit	Predicted Value at Government		Predicted Value at Nonprofit	Predicted Value at Government
<u>Mentally Handicapped Facilities</u>						
Presence of Waiting List	1.19** (0.33)	0.84	0.43	0.40** (0.15)	0.74	0.60
Waiting List Length	-45.74 (36.57)	50.09	80.12	17.34 (13.90)	64.46	52.22
<u>Nursing Homes</u>						
Presence of Waiting List	0.61* (0.37)	0.89	0.74	0.12 (0.20)	0.71	0.66
Waiting List Length	8.22 (15.56)	47.49	41.25	1.00 (15.6)	56.11	55.39

Notes: Standard errors reported in parentheses. \* denotes significance at the 10% level. \*\* denotes significance at the 5% level. The following control variables were also included in the estimation: size, age, proportion of beds certified for Medicare and Medicaid. The estimates of these variables are not reported here, but are available on request.

Table 4: OLS Estimates of Differences in Prices per Patient-Month between Nonprofit and Government Facilities by Industry, 1976

	Coefficient on Nonprofit Dummy
Mentally Handicapped Facilities	\$ 237.47** (92.35)
Nursing Homes	\$ 34.16 (55.07)

Notes: Standard errors reported in parentheses. \* denotes significance at the 10% level. \*\* denotes significance at the 5% level. The following control variables were also included in the estimation: size, proportion of beds certified for Medicare and Medicaid and average cost per patient month. The estimates of these variables are not reported here, but are available on request.

Table 5: Probit Estimates of Consumer Satisfaction with Services by Industry, 1976

Mentally Handicapped Facilities

Satisfaction Measure	Estimate on Nonprofit Dummy	Predicted Satisfaction in Nonprofits	Predicted Satisfaction in Government
Overall	0.15 (0.20)	0.97	0.96
Buildings & Grounds	0.10 (0.17)	0.80	0.77
Rooms	0.37** (0.15)	0.80	0.68
Treatment	0.11 (0.15)	0.66	0.62
Staff	0.27* (0.16)	0.77	0.68
Social	0.34** (0.14)	0.55	0.42

Nursing Homes

Overall	-0.22 (0.22)	0.94	0.96
Buildings & Grounds	0.24 (0.18)	0.80	0.74
Rooms	0.51** (0.17)	0.86	0.71
Treatment	0.30* (0.16)	0.75	0.64
Staff	0.33* (0.17)	0.71	0.59
Social	0.24* (0.14)	0.49	0.38

Notes: Standard errors reported in parentheses. \* denotes significance at the 10% level. \*\* denotes significance at the 5% level. The following control variables were also included in the estimation: age of the facility, age of the patient, patient's length of stay, and average charge per patient month. The estimates of these variables are not reported here, but are available on request.

Table 6: Tobit Estimates of Labor Input Intensities by Industry, 1976 and 1987

Mentally Handicapped Facilities

Labor Input+	1976 SIP			1987 NMES		
	Coefficient on Nonprofit Dummy	Predicted Intensity in Nonprofit	Predicted Intensity in Government	Coefficient on Nonprofit Dummy	Predicted Intensity in Nonprofit	Predicted Intensity in Government
FTMD	-1.81** (0.37)	0.09	0.69	-2.78** (0.43)	0.24	1.23
FTRN	-11.29** (2.22)	2.62	8.07	-5.31** (1.04)	3.55	6.85
FTRLPN	-22.73** (6.11)	5.08	13.34	-8.82** (1.80)	4.59	9.48
FTAIDE	-19.72** (2.55)	4.60	17.80	-78.76** (18.01)	32.71	70.06
PTMD	-4.64** (1.11)	0.93	2.73	3.82** (1.26)	5.37	3.38
PTRN	1.18 (0.69)	0.40	0.20	4.79** (1.18)	4.70	2.39
PTLPN	9.27** (1.09)	0.56	0.00	7.28** (2.26)	3.33	1.47
PTAIDE	4.25 (2.83)	2.15	1.22	16.08** (7.12)	2.09	0.86

Nursing Homes

FTMD	-6.09** (2.10)	0.65	2.16	0.13 (1.59)	0.72	0.70
FTRN	0.28 (0.49)	2.30	2.08	-2.86** (0.90)	4.67	6.89
FTRLPN	0.06 (0.56)	2.54	2.50	-1.55 (1.05)	5.55	6.67
FTAIDE	-2.43 (2.10)	15.64	17.89	-4.28 (2.33)	21.87	25.62
PTMD	-1.21 (0.91)	0.66	1.02	-0.77 (0.53)	1.65	2.10
PTRN	-0.46 (0.83)	1.24	1.43	-0.56 (0.64)	2.51	2.86
PTLPN	2.79** (1.03)	1.21	0.47	-0.73 (0.60)	2.41	2.89
PTAIDE	-1.36 (1.56)	4.27	5.13	-0.39 (2.35)	10.41	10.41

+ In this column, the first two letters of the name of the input refer to full-time (FT) or part-time (PT) status. The rest of the letters refer to the type of input: Medical Doctor (MD), Registered Nurse (RN), Licensed Practical Nurse (LPN), Nurse Aide (AIDE).

Notes: Standard errors reported in parentheses. \* denotes significance at the 10% level. \*\* denotes significance at the 5% level. The following control variables were also included in the estimation: size, age, proportion of beds certified for Medicare and Medicaid, average charge per patient month and proxies for case-mix. The estimates of these variables are not reported here, but are available on request.

