THE EFFECT OF PUBLIC POLICIES ON NURSING HOME CARE IN THE UNITED STATES

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Current demographic trends suggest that the demand for beds in nursing facilities will grow dramatically in the near future. Population forecasts suggest that the 85 and older age group, the major consumer group behind nursing home care, will continue to burgeon as a percentage of total population to 1.7 percent in 2005, 2 percent in 2020, and 4.6 percent by 2050 [*Statistical Abstract of the U.S.*, 1998]. Caring for a growing elderly population most likely means rising health care costs. Mendelson and Schwartz [1993] note that an aging population accounts for 35.4 percent of the annual rise of total real spending on nursing home care. Currently, nursing home care represents the fourth largest personal health care spending category after hospital care, physician care, and drugs. Nursing home care expenditures reached $90 billion in 1999, and have increased at an average annual rate of 7.2 percent since 1980. Public programs funded about 60 percent of nursing home costs in 1999 [Cowan et al., 2001].

With the graying of America and potentially surging nursing home costs, a better understanding of the operation and performance of the nursing home industry seems imperative. One aspect of the industry deserving particular attention concerns how various public policies like Medicaid reimbursement influences the level and growth of nursing home beds. DuNah et al. [1995] show that the growth of nursing home beds grew slowly but steadily across U.S. states from 1978 to 1993. In addition, they argue that some states have an oversupply while others possess an undersupply of beds. They point to conditions on the demand and supply sides of the market and various public policies as the reasons for the variation in beds across states. DuNah et al. stress that new empirical studies are needed to explain precisely why the disparity of nursing home beds exists in different markets. In this study, we hope to address this gap in the literature by paying particular attention to the effect of public policies on the utilization and availability of nursing home care.

Specifically, this paper models and empirically examines how Medicaid reimbursement, certificate of need laws, and state corporate income tax rates affect the number of residents and beds in nursing facilities throughout the United States.

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County-level data encompassing the entire United States are used in the empirical analysis. In general, the findings indicate that a higher Medicaid reimbursement rate leads to a greater availability and utilization of nursing home services. The empirical findings further show that the state corporate tax rate inversely influences the availability and utilization of nursing home services. Lastly, this study determines that state certificate of need programs have no significant negative impact on the availability of nursing home care. Several policy implications are drawn from the empirical findings.

EMPIRICAL MODEL, SAMPLE, AND DATA

The main objective of this study is to determine empirically the sensitivity of the "market" output of nursing home care with respect to various public policies. As a result, the definition of the relevant geographical market for nursing home care becomes an important consideration. It is assumed that the county represents the relevant geographic market. While this assumption is made primarily for data purposes, markets for health care services tend to be local in nature. In addition, many studies have used the county as the relevant geographic market for nursing home care [Nyman, 1993] and other types of health care services [Santerre and Bennett, 1992; Lynk, 1995].

To guide the proper selection of variables for the estimation equation, the dual physician market model developed by Sloan, Mitchell, and Cromwell [1978] and Scanlon's [1980] price discrimination model of the nursing home industry are relied upon to develop the conceptual model. Our conceptual model supposes that the representative monopolistically competitive nursing facility confronts demands in three different local submarkets. The assumption of a monopolistically competitive market structure follows from the fact that location plays an important role when individuals select nursing home care. In particular, elderly individuals most likely prefer to live in nursing facilities that are located near the homes of friends and relatives.

In the first local submarket, the "private long-term care market", each nursing facility faces a downward-sloping demand curve and has some ability to determine the price, P_P, charged to private-pay residents. The chosen price for private long-term care ultimately depends on the strength of the private demand curve and the opportunity cost, in terms of forgone profits, of servicing other types of residents. In the "Medicaid long-term care market", the second local submarket, nursing facilities confront an exogenously set price for nursing care services, P_M. While each state government exogenously sets the Medicaid reimbursement rate, it differs across states because of variations in the collective willingness and ability to pay for nursing care.

Finally, in the third local submarket, the "short-term care market", the typical nursing facility provides services to patients receiving post-hospital care. Third-party payers such as the Medicare program or commercial insurers are responsible for paying the price of short-term care, P_S. Since most third-party payers operate in larger regional or national markets and are likely to possess some monopsony power, the real price (money price adjusted for regional differences in the cost of living) for short-term nursing care is not likely to differ systematically across individual local (county) markets. Given this consideration and lack of suitable data, P_S is assumed to be

relatively constant across market areas and therefore drops out of the estimation equation.

The profit-maximizing nursing facility determines the total market output of nursing care to provide by horizontally summing the marginal revenue curves in all three submarkets and then comparing the combined marginal revenue curve to the marginal cost of production. While the precise mix of private-pay, Medicaid nursing care, and short-term care depends on which type of care adds more to economic profits at the margin, the total market output of nursing care, N, the combined private-pay, Medicaid and short-term care, depends on the exogenous factors in the model. Consequently, the market output of nursing home care can be expressed as a reduced-form general function like the following:

(1) $$N = N(D_P, P_M, D_M, D_S, C, R)$$

where D_P, D_M, and D_S stand for demand shifting exogenous factors affecting the relative strengths of the private, Medicaid, and short-term demands. Exogenous factors influencing the cost of providing nursing home services are represented by C. The variable R stands for two other public policies in addition to the Medicaid reimbursement rate that may affect the availability of nursing care. Under normal demand and cost conditions, the model predicts that the market output of nursing care, N, increases with D_P, D_M, and D_S, but declines with C. The hypothesized relationships between the market output of nursing care and both P_M and R are discussed below.

In the empirical estimation of equation (1), the total number of nursing home beds and residents provides two measures of the market output of nursing home care, N in each county. These two measures allow us to determine how the various factors in the model affect both nursing care availability and utilization. Both of these measures are divided by the number of elderly individuals (people older than 65 years) in the county so as to directly control for the size of the market.

To capture the strength of the private demand for long-term nursing care, D_P, various demand studies [Lamberton, Ellington, and Spear, 1986; Nyman, 1993; Reschovsky, 1996] are relied upon. These demand studies show that the private demand for nursing home care is largely a function of (1) ability to pay, as measured by income; (2) need, as captured by the percentage of elderly people, or percentage of elderly females; (3) tastes and preferences for nursing home care as reflected in race, among other factors; and (4) the availability of informal care in noninstitutional settings as revealed by variables like the (inverse of the) divorce rate and the female labor force participation rate. In the spirit of previous studies, the empirical model captures the strength of the private demand with per capita income in 1989, population density, the number of persons 85 years of age and older as a fraction of the elderly population, the divorce rate, the female labor force participation rate, and the percentages of population that are white or black.

The exact relation between per capita income and the quantity of nursing home care demanded depends on whether nursing home care is a normal or an inferior good. For a normal (inferior) good, a direct (inverse) relation exists between income and the market output of nursing home care. Most studies find that a normal good classification holds for private long-term nursing home care. Population density and

the age variable (number of persons 85 years of age and older) should directly affect the market output of nursing home care. Simply put, larger population reflects a greater number of buyers and health capital depreciates more rapidly with age. Higher female labor force participation rates and divorce rates are also expected to increase the demand for nursing home care. As Greenberg notes, "a large number of individuals who might have stayed home to care for their parents are now in the formal labor force, which increases the opportunity cost of attending to the needs of elderly. In addition, divorce rates have grown, and individuals are unlikely to care for a former spouse's parents" [1991, 129-30]. The percent of the population that is white and the percent that is black control for any impact that race may have on the demand for and/or supply of nursing home care. For example, Reschovsky [1996], among others, finds that minorities are about 14 percent less likely to demand nursing home care than whites.

Similar to an approach taken by Sloan, Mitchell, and Cromwell [1978], one final factor, the stock of nursing homes, is specified in the estimation equation to control for the strength of the private demand, D_P, facing the representative nursing facility. A greater number of nursing facilities means that each monopolistically competitive nursing home faces a lower demand and therefore charges a lower price for care. To the extent that price is lower on average and a greater number of providers exist, the total quantity of nursing home care demanded should be greater in the market. As a result, the market output of nursing home care is expected to increase with a greater number of nursing homes in the county.[1] To avoid any endogeneity problems, a lagged measure of the stock of nursing homes, the number of nursing homes per capita in 1986, is used in the empirical test. A lagged measure of this kind may be crucial for properly specifying the model. The lagged measure of nursing homes captures the relative attractiveness of the market area to suppliers that is not already reflected in the other exogenous factors in the model and for which data are unavailable (for example, the price of land).

Medicaid beneficiaries as a percentage of county population would serve as the best measure for the potential strength of the Medicaid nursing home demand, D_M. Unfortunately, data on the number of Medicaid beneficiaries are unavailable below the state level so the percentage of the population in the county that receives Supplemental Security Income (SSI) is used as a proxy variable. To receive matching grants from the federal government, states must provide Medicaid services to SSI recipients. At the state level, the correlation between percentage of the population that receives Medicaid benefits and the percentage of the population that receives SSI is 0.76. It is anticipated that the quantity of nursing home care increases with a greater percentage of SSI recipients, *ceteris paribus*.

The strength of the short-term care demand, D_S, is also specified in equation (1). The number of physicians and hospitals per 100,000 population and the percentage of the population older than 65 years in the county represent the strength of the short-term demand in the estimation equation. Both physicians and hospitals serve as potential referral sources for short-term nursing care. For example, hospitals may admit their patients to nursing homes for short-term post-operative care. In addition, since patients essentially pay a zero price for hospital care because of third party coverage, a main determinant of acute care services will be timely access to health

care providers. More access may mean a greater amount of invasive medical interventions and hence the necessity for post-hospital care in nursing homes.[2] If so, a direct relation should be uncovered empirically between both physicians per capita and hospitals per capita and the market output of nursing home care. The percentage of the population greater than 65 years of age proxies for Medicare coverage in the county and captures the likely population requiring post-hospital care in a nursing home. As such, a direct relation is expected between the percentage of population greater than 65 years of age and the quantity of nursing home care.

Previous studies show that input prices for labor, land, and capital influence the cost, C, of providing nursing home care [Birnbaum et al., 1981; Meiners, 1982; Sulvetta and Holahan, 1986]. Since we are conducting a cross-sectional regression analysis, the real prices of labor and capital should not differ across observations if perfect mobility of resources exists in the long run. It follows that these input prices drop out of the empirical model. Data are unavailable for the price of land.

Various public policy differences across states may alter the revenue to cost margin and thereby affect the provision of nursing home care. A certificate of need law is one public policy that may influence the provision of nursing home care. These laws require that nursing home care providers seek approval before increasing their capital expenditures and may be applied to existing firms or new firms that would like to enter the market. The intention behind the laws is to limit unnecessary beds and contain health care costs. It has also been argued theoretically that certificate of need laws create a barrier to entry and thereby discourage the location and expansion of nursing homes [Feldstein, 1988; Feder and Scanlon, 1980]. However, some researchers question the effectiveness of the laws, citing the "lack of coordination with other regulatory programs, lack of significant compliance mechanisms, politicized review processes, and high approval rates for most requests" [Harrington, et al., 1997, 575]. Harrington, et al. [1997] find empirically that certificate of need laws have led to significant reductions in the *growth* of nursing home beds. No recent studies have examined the impact of these laws on the *level* of nursing home care. As a result, a variable is specified in the estimation equation indicating the number of years that a state certificate of need law had been in place prior to 1991 in each state.[3] It is hypothesized that binding state certificate of need laws have a cumulative effect over the years, so that states with these laws in place for the longest periods of time witness a greater reduction of the market output of nursing home services.

The Medicaid reimbursement rate for nursing home care, P_M, in equation (1) is another public policy that may affect the availability of nursing home care. It is measured by the weighted average of the *per diem* rates that each state Medicaid program reimburses for skilled nursing care and intermediate nursing care. But because some states include payment for various types of ancillary services like physical therapy, physician services, and prescription drugs in the base Medicaid reimbursement rate, adjustment must be made for the number of ancillary services already included in the base Medicaid reimbursement rate (up to a maximum of nine). To do that, the Medicaid *per diem* reimbursement rate is divided by the number of ancillary services included in the daily rate. In this way, the stated *per diem* Medicaid reimbursement rate is made more comparable across states.[4]

The theoretical relation between the Medicaid reimbursement rate and the market output of nursing home care is a fairly complicated issue. The net effect of a change in the Medicaid reimbursement rate on the market output of nursing home care depends on whether there exists an excess demand for Medicaid beds, the price elasticity of demand for private nursing home care, and the degree to which capacity constraints are binding in the nursing home industry. Thus, the precise relation between the Medicaid price and the market output of nursing home care remains an empirical issue. Empirical studies have shown that Medicaid patient access to nursing home care is directly influenced by the Medicaid reimbursement rate [Scanlon, 1980; Phillips and Hawes,1988; Reschovsky, 1996].

As another public policy variable, we also control for state corporate tax rate differences across observations. Economic theory suggests that taxes affect the after-tax rate of return on resources and discourage or reallocate production. In fact, Gulley and Santerre [1993] have shown that the location and expansion of hospitals are influenced by corporate tax rate differences across states. In particular, for-profit hospitals are less likely to locate in high tax states, *ceteris paribus*. Since most nursing homes are organized on a for-profit basis, tax rate differentials may also affect the number of nursing home patients and beds in various markets. The expectation is that the market output of nursing home care declines with a higher effective corporate tax rate. The effective corporate tax rate is found by adjusting the nominal corporate tax rate for the deductibility of federal taxes.

Before proceeding to the empirical results, it is important to note that using county level data substantially reduces the potential endogeneity problems normally associated with using data that identify state level public choices. The years of certificate of need laws, the Medicaid reimbursement rate, and the corporate tax rate are much less endogenous at the county level than at the state level. Any one county in isolation most likely has only a small influence on the state possessing a certificate of need law or on the setting of the Medicaid reimbursement rate and the state corporate income tax rate. The major source of the data is the CD-ROM version of the U.S. Census Bureau's *County and City Data Book*. This particular data source contains a wide variety of data for over 3,100 counties for a number of different years. The year 1991 is chosen because it is the latest year for which all data are available at the time of this study. In addition, from Swan et al. [1993b], Harrington, DuNah, and Curtis [1993], and the the Council of State Government's *Book of the States* [various issues], the rest of the necessary data are collected. Table 1 reports the means, standard deviations, minimum and maximum values, and data sources of the variables used in the empirical estimation process. Although not shown in Table 1, it should be pointed out that the typical market area (county) with 80,000 people contained nearly 5 nursing homes in 1991. The average nursing home held slightly over 100 beds. Certificate of need laws did not exist in 777 (25 percent) of the market areas in 1991.

EMPIRICAL RESULTS

For estimation purposes, all of the continuous variables in the model are converted to log-form so the various elasticities are readily apparent. White's test uncovered heteroskedasticity so White's correction method is used to derive heteroskedastic

TABLE 1
Summary Statistics

Variable	Mean	Std. Dev.	Min.	Max.	Source
Dependent Variables					
(RESIDENTS/ELDERLY POP)×10,000	564	335	0	3673	U.S. Census
(BEDS/ELDERLY POP) ×10,000	619	373	0	3982	U.S. Census
Private Demand Factors					
PER CAPITA INCOME ($)	11158	2725	3417	28381	U.S. Census
POPULATION DENSITY (per square mile)	220	1431	0.04	52378	U.S. Census
POP 85 AND OLDER/POP 65 YEARS +	0.10	0.14	0	0.20	U.S. Census
PERCENT FEMALE LABOR FORCE	0.52	0.07	0.25	1.00	U.S. Census
DIVORCE RATE PER 1,000	4.68	8.36	0	428	U.S. Census
PERCENT BLACK	0.09	0.14	0	0.86	U.S. Census
PERCENT WHITE	0.87	0.16	0.05	1.00	U.S. Census
1986 NURSING HOMES/ELDERLY POP×10,000	8	6	0	50	U.S. Census
Medicaid Demand Factor					
SSI RECIPIENTS/POPULATION	0.02	0.02	0	0.15	U.S. Census
Short-Term Demand Factors					
PHYSICIANS PER 100,000	93	104	0	2036	U.S. Census
HOSPITALS PER 100,000	386	441	0	7342	U.S. Census
PERCENT POP 65 YEARS +	0.15	0.04	0.01	0.34	U.S. Census
Public Policy Variables					
YEARS OF CON LAWS	11.9	7.86	0	27	Gulley and Santerre [1993]
MEDICAID REIMBURSEMENT RATE ($/day/service)	10	7	6	50	Swan et al. [1993b]
EFFECTIVE CORPORATE TAX RATE (%)	6.6	2.4	0	12.65	Book of the States

consistent estimates. Since the results are very similar for both measures of market output, the discussion focuses solely on the findings for the number of residents per 10,000 elderly in Table 2. Table 3 reports the regression results for the number of beds.

According to the empirical results, about two-thirds of the variation in nursing home residents per 10,000 elderly is explained by the various right-hand side variables. Two-thirds represents a sizeable amount to explain given that the sample has slightly over 3,100 widely diverse counties. Our conceptual model predicts that the market output of nursing home care increases in response to a greater private demand for long-term care. Many of the estimated coefficients on the private demand factors have their expected signs and most of them are statistically significant. For example, the empirical findings indicate that the utilization of nursing home care increases with population density, the proportion of population older than 85 years, the divorce rate, a higher percentage of individuals who are white, and a greater (lagged) number of suppliers. In contrast to expectations, per capita income has a negative parameter estimate and is statistically significant. Apparently, nursing home

TABLE 2
Nursing Home Residents per Persons 65 Years and
Older Regression Results

Variables	Estimated Coefficient	t-statistic
PRIVATE DEMAND FACTORS:		
PER CAPITA INCOME	−0.996[a]	3.52
POPULATION DENSITY	0.366[a]	11.11
% POP 85 YEARS AND OLDER	1.408[a]	4.03
% FEMALE LABOR FORCE	−0.455	0.85
DIVORCE RATE PER 1,000	0.0919[a]	2.39
%BLACK	0.083[b]	1.85
%WHITE	0.359[b]	1.60
NURSING HOMES PER CAPITA IN 1986	1.048[a]	24.41
MEDICAID DEMAND FACTORS		
% SSI RECIPIENTS	−0.353[a]	−2.48
SHORT-TERM DEMAND FACTORS		
PHYSICIANS PER 100,000	0.031	1.35
HOSPITALS PER 100,000	0.068[a]	4.95
% POP 65 YEARS AND OLDER	−0.535	1.59
PUBLIC POLICY VARIABLES		
YEARS OF CON LAWS	−0.001	0.31
MEDICAID REIMBURSEMENT RATE	0.259[a]	3.16
EFFECTIVE CORPORATE TAX RATE	−0.052[a]	2.00

Constant term   13.850 (t=5.28)
Adjusted R^2 0.675
Number of Observations   3141

a.   Signifies significance at the 5 percent level or better.
b.   Signifies significance at the 10 percent level.
All continuous variables are expressed in log-form.

care is an inferior good possibly due to the structure of the Medicaid program as noted by Scanlon [1980].

The conceptual model further predicts that the market output of nursing home care increases in response to a greater Medicaid demand. In our estimation equation, the percentage of the population receiving SSI serves as a proxy for the strength of Medicaid demand. Apparently, the SSI rate serves as a poor proxy because its coefficient estimate is negative rather than positive and statistically significant. As mentioned above, a better measure might be Medicaid recipients per capita in the county but these data are not available below the state level. However, an alternative explanation might account for the observed inverse relationship between these two variables. Holding the Medicaid reimbursement rate constant, the negative coefficient on the SSI variable might reflect the relatively high cost of delivering nursing home services to SSI recipients who are typically blind or otherwise disabled. The rela-

TABLE 3
Nursing Home Beds per Person 65 Years and Older Regression Results

Variables	Estimated Coefficient	t-statistic
PRIVATE DEMAND FACTORS:		
PER CAPITA INCOME	−0.971[a]	3.39
POPULATION DENSITY	0.368[a]	11.09
% POP 85 YEARS AND OLDER	1.417[a]	4.01
% FEMALE LABOR FORCE	−0.594	1.11
DIVORCE RATE PER 1,000	0.094[a]	2.44
%BLACK	0.085[b]	1.88
%WHITE	0.344	1.53
NURSING HOMES PER CAPITA IN 1986	1.060[a]	24.48
MEDICAID DEMAND FACTORS		
% SSI RECIPIENTS	−0.391[a]	2.72
SHORT-TERM DEMAND FACTORS		
PHYSICIANS PER 10,000	0.031	1.31
HOSPITALS PER 10,000	0.068[a]	4.88
% POP 65 YEARS AND OLDER	−0.549	1.61
PUBLIC POLICY VARIABLES		
YEARS OF CON LAWS	−0.004	0.95
MEDICAID REIMBURSEMENT RATE	0.252[a]	3.02
EFFECTIVE CORPORATE TAX RATE	−0.049[b]	1.84

Constant term   13.508 (t = 5.09)
Adjusted R^2 0.676
Number of Observations   3141

a. Signifies significance at the 5 percent level or better.
b. Signifies significance at the 10 percent level.
All continuous variables are expressed in log-form.

tively more severe case-mix and higher cost may discourage nursing homes from locating or expanding in areas with high concentrations of SSI recipients.

A greater short-term demand should increase the market output of nursing home care according to the conceptual model. Our proxies for short-term demand are hospitals and physicians per capita and the percentage of the population aged 65 years or older. The coefficients on two of the three short-term demand variables possess their anticipated sign and one of them is statistically different from zero. More important to this study is the impact of public policies on the utilization and availability of nursing home care services. For that reason, the number of years that certificate of need laws have been in effect, the Medicaid reimbursement rate, and the state corporate income tax rate are specified in the estimation equation. Recall that certificate of need laws and high state corporate income taxes are expected to discourage nursing homes from locating and expanding in various areas. Thus, it is hypothesized that the utilization and availability of nursing home care decline with years under these

laws and the state corporate income tax rate. Theoretically it is unclear how the Medicaid reimbursement rate affects the market output of nursing home care.

The empirical results associated with the three public policies prove to be very interesting and worthy of discussion. While the coefficient on years under certificate of need laws is negative, as expected, its magnitude is not different from zero at conventional levels of statistical significance. This finding suggests that market areas (counties) subject to these laws possess roughly the same amount of nursing home residents and beds per 10,000 elderly than otherwise comparable market areas without these laws. Relatively high approval rates for most certificate of need requests may provide the explanation for the observed similarity [Harrington et al., 1997].

Since the coefficient estimate on the Medicaid reimbursement rate is positive, the findings suggest that a higher rate is associated with a greater output of nursing home care. In fact, the estimated coefficient on the variable indicates that a 10 percent increase in the reimbursement rate is associated with a 2.59 percent increase in the number of nursing home residents. Our finding of an inelastic response to changes in the Medicaid reimbursement rate agrees with the original study by Sloan, Mitchell and Cromwell [1978] for physician services and a very recent study by Mayer, Stearns, Norton, and Rozier [2000] for dental services. Evaluated at the means for the sample, the empirical results suggest that the number of residents would increase from 564 to 579 per 10,000 elderly in the typical market area in response to a 10 percent rise in the average reimbursement rate.

Finally, an inverse relation between the state corporate tax rate and nursing home care is hypothesized. The empirical results support the hypothesis but the relation between these two variables is found to be quantitatively small. Specifically, a 10 percent increase in the effective corporate income tax rate is associated with only a 0.5 percent decrease in the number of nursing home residents. Evaluated at the means, nearly 3 fewer patients per 10,000 elderly would lose a nursing home bed because of a 10 percent increase in the average state corporate income tax rate. In agreement with this result, Gulley and Santerre [1993] find that hospitals respond only minimally to changes in the state corporate tax rate.

Before this section is concluded, it should be pointed out that the reported results are robust to several alternative specifications. First, a set of regional dummy variables was specified to capture important but difficult to measure differences across the nine regions of the United States such as climate or cost of living. Second, the lagged measure of nursing homes per capita was excluded from the regression equation. In both alternative specifications, the general thrust of the findings remains unaltered.

SUMMARY AND CONCLUSIONS

Using a rich county-level data set, this study tests a wide variety of hypotheses concerning the factors that affect the provision of nursing home services across market areas of the United States. The empirical evidence indicates that both the availability and utilization of nursing home care are greater in market areas where population is dense, the divorce rate is high, Medicaid reimbursement is more generous, the number of hospitals is large, there are more people 85 years and older, and where

state corporate income tax rates are low. From these results, a number of policy implications emerge.

First, the study finds the same number of nursing home beds and residents in otherwise comparable counties with and without certificate of need laws. The finding of a similar amount of nursing home care is surprising given that these laws are designed to prevent excess facilities and beds. It must be the case that normal market forces produce the same outcome as direct government intervention. Given the general ineffectiveness of certificate of need regulations and that certificate of need request hearings can be time-consuming and use up valuable resources, it is not surprising that many states eliminated these laws soon after the National Planning Act and Resources Development Act of 1974 was repealed in 1986.

Second, the Medicaid reimbursement rate is found to directly influence the total number of nursing home beds. Consequently, raising the Medicaid reimbursement rate can encourage a greater number of nursing home beds. The quantitative impact is found to be small, however. To accommodate a growing elderly population in future years, a relatively large increase in the Medicaid reimbursement rate may be necessary to materially increase the number of nursing home beds in the typical market area.

Third, a high state corporate income tax is found to discourage nursing homes from locating and expanding in areas. Once again, however, the magnitude of the empirical relation is found to be quantitatively small. As a result, elimination of the state corporate income tax rate on for-profit nursing homes may not be a cost-effective way to attract more nursing homes, especially given the potential for tax revenue losses.

In general, this study finds that public policies do affect the availability and utilization of nursing home care services. However, the provision of nursing home care tends to be relatively insensitive to public policies. Of course, some other important ways that state governments may encourage a greater availability of nursing home care may have been overlooked. Construction loan subsidies and property tax abatements are two policies that come to mind. Examining the impact of policies such as these on the availability of nursing home care is an avenue for future research.

NOTES

1. Holding population density constant, a greater supply of nursing homes also means that time costs of travel are lower. Elderly individuals may be more likely to demand nursing home care when they know that friends and relatives are more likely to visit them on a regular basis. The greater convenience that more suppliers offer may create a greater demand for institutionalized long-term care.
2. The supplier-induced demand theory also predicts a greater quantity of medical services demanded in areas where the stock of physicians is greater. [Santerre and Neun, 2000, 287-89].
3. As of the end of 1988, Arizona, California, Colorado, Idaho, Kansas, Minnesota, New Mexio, South Dakota, Texas, Utah and Wyoming had repealed their certificate of need legislation. We also experimented with a dummy variable indicating the presence of these laws. The results were similar to those reported below.
4. Louisiana is the only state that does not include payment for any ancillary services in the base rate. Thus, our Medicaid reimbursement rate is actually the reimbursement rate divided by one plus the number of ancillary services.

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