The Effects of Ownership and Ownership Change on Nursing Home Industry Costs

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Objective. This study examines the effects of ownership type and ownership change on nursing home cost structures, differentiating patient care costs from plant costs.
Data Sources. Administrative data from the Michigan Department of Social Services, Medical Services Administration (Medicaid), and the Michigan Department of Public Health are used. Cost data are based on audited cost reports for 393 nursing care facilities in Michigan in 1989. Other facility characteristics are based on data from the 1989 annual licensing and certification survey conducted by the Michigan Department of Public Health.
Study Design. A series of ordinary least squares regressions is estimated, in which the dependent variable is either per diem patient costs or per diem plant costs. Ownership types are defined as chain, proprietary non-chain, freestanding non-profit, government-owned, and hospital-based facilities. Pooled estimation techniques, as well as separate regressions by ownership type, are presented to test for interaction effects. Key variables include whether a facility changed ownership in the preceding five years and whether chain facilities are in-state- or out-of-state–owned, in addition to size, payer mix, and case mix.
Principal Findings. Behavioral differences among nursing home ownership types in respect to patient care costs tended to distinguish government-owned and hospital-based facilities from the freestanding homes rather than the usual distinction between for-profit and not-for-profit classes. Variables traditionally included in nursing home cost studies, such as size, occupancy, payer mix and case mix, were found to have similar effects on per diem patient care costs for freestanding non-profit homes as well as for chain proprietary facilities. With regard to the effects of ownership change on per diem plant and per diem patient costs, however, there are few differences among ownership types. Chain and non-chain for-profit facilities, non-profit homes, and hospital long-term care units that had changed ownership reported significantly higher per diem plant costs than facilities without a change of ownership, but did not spend more on patient-related costs. Michigan Medicaid plant reimbursement system policy changes instituted in 1985 to promote continued ownership of facilities were not entirely successful.
Conclusions. Non-profit homes look increasingly like their for-profit counterparts with respect to spending on patient care costs. Increased competition for the more lucrative private-pay patients, coupled with declining state Medicaid reimbursement

to nursing homes, may have blurred the historical distinctions between the non-profit and for-profit sectors in the nursing home industry. An exception to increasing homogeneity within the nursing home industry is the tendency of proprietary homes to experience more frequent changes of ownership, which results in higher capital costs passed on to state Medicaid programs. Findings from this study indicate that while facility sales increase per diem plant costs, they do not result in increased spending for direct patient care, suggesting that state Medicaid programs may be indirectly subsidizing facility sales with no accompanying increase in expenditures for patient care. To discourage frequent facility sales, state Medicaid programs may need to consider alternative methods of reimbursing nursing home owners for capital costs.

Key Words. Nursing home costs, ownership type, ownership change, nursing home capital costs

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The costs of nursing home care in the United States represent substantial financial burdens on both private individuals and public payers. State Medicaid programs, designed originally to provide temporary acute care coverage for the poor and medically needy, have become the primary third party payers for long-term nursing home care. In 1991, total spending for nursing home care in the United States reached $59.9 billion. Of this amount 47.4 percent, or $28.4 billion, represented public financing–primarily from the Medicaid program (Burner, Waldo, and McKusick 1992). Identifying the determinants of nursing home costs has been of major concern to policymakers over the past two decades as states have attempted to balance pressures to contain costs with concerns about quality of care. The purpose of this study is to examine the effects of ownership auspices and ownership change on nursing home cost structures. Both ownership auspices–whether a nursing home is for-profit, non-profit, or government-owned–and reimbursement methodology–how nursing homes are paid for the services they provide–are considered important factors associated with cost variation in the nursing home industry.

Based on nursing home cost studies conducted in the early and mid-1980s that documented perverse economic incentives operating in the ways nursing home rates were set, states have moved aggressively to restructure their reimbursement methodologies and to limit nursing home bed supply

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(Lee, Birnbaum, and Bishop 1983; Holohan and Cohen 1987). Prospective or flat-rate reimbursement systems have replaced retrospective, cost-based payments to nursing homes; ceilings on allowable costs have been established, usually based on the experience of a particular class of nursing homes; and certificate-of-need programs have been instituted in most states to constrain new nursing home construction.

Recently, discussion has focused on reimbursement to nursing home providers for capital costs–particularly on how nursing home sales affect costs in the nursing home industry (Baldwin and Bishop 1984; Cohen and Holohan 1986; Boerstler, Carlough, and Schlenker 1991a,b). The buying and selling of nursing homes, a perennial characteristic of the nursing home sector in the United States, has occasioned concerns about the effects of facility sales on nursing home quality and costs, as well as about the stability of ownership in the nursing home industry. To date, however, research on capital costs has been based on case studies of capital reimbursement systems or hypothetical simulation models (Baldwin and Bishop 1984; Cohen and Holohan 1986; Boerstler, Carlough, and Schlenker 1991a,b). Explicit modeling of the effects of facility sales on the capital component of nursing home costs are absent in nursing home cost studies.

Ownership type is also an important factor associated with nursing home costs because of the presumed relationship between ownership auspices and organizational goals and behavior (Scanlon 1980; Weisbrod and Schlesinger 1986; Arling, Nordquist, and Capitman 1987; McKay 1991). The for-profit nursing home is assumed to be motivated by profit maximization goals, while non-profit homes are assumed to desire to deliver the level and quality of services promised (Weisbrod 1988; Hansmann 1987), or to maximize their size subject to environmental constraints (Scanlon 1980). Theories concerning the role and performance of government-owned facilities are less well developed, resulting in most nursing home studies combining government nursing homes and non-profit homes into a single ownership category.

Different goal orientations are believed to lead to different provider behaviors in the nursing home sector. For-profit homes will minimize costs in order to generate a profit, while in non-profit and public nursing homes, expenditures will equal revenues (plus subsidies). Within the proprietary, or for-profit sector, the emergence of large, publicly held nursing home chains, under maximum pressure to generate profits for investors, has led to additional concerns about the effects of chain ownership on nursing home industry performance.

Previous nursing home studies have reported significant cost differences among different ownership classses even after controlling for factors known to be associated with nursing home cost functions such as payer mix, case mix, occupancy, and quality (Cohen and Dubay 1990; Arling, Nordquist, and Capitman 1987; Nyman 1988; McKay 1991). Non-profit homes, government homes, and nursing home beds attached to hospitals have consistently demonstrated higher operating costs than proprietary facilities. Despite widespread assumptions about the probable relationship between the profit-maximizing goals of chain facilities and cost-cutting behavior, the empirical evidence about chain ownership is mixed. Several early studies on nursing home costs that used data from the 1973/1974 National Nursing Home Survey found that chain ownership did not make a difference (Birnbaum et al. 1981; Meiners 1982). An empirical study conducted by Cohen and Dubay (1990) using 1983 national data reported that although chain facilities reported lower costs, they did not do so at the expense of quality; nor did they achieve lower costs through a lighter case-mix population. A 1987 analysis of the Virginia nursing home industry (Arling, Nordquist, and Capitman 1987), however, reported that chain facilities have the lowest operating costs of all facility types, servicing primarily a Medicaid market, and are insensitive to case-mix differences. McKay (1991), in a study of Texas nursing homes, found that chain facilities exhibit lower costs at intermediate and high levels of output (patient days), but higher costs at low and very high output levels.

Nursing home cost studies have typically used total facility costs as the dependent variable to analyze differences in spending across ownership categories. This limits our ability to determine whether ownership effects vary by distinctive components of the reimbursement system–such components usually defined as patient-related versus non-patient-related spending. This limitation is particularly problematic in any attempt to assess the effects of facility sales on nursing home costs, because capital costs comprise such a relatively small portion of total facility spending (around 10 percent). Yet it is increasingly recognized that the ways in which capital costs are reimbursed by state Medicaid programs have favored the buying and selling of nursing home facilities as real estate investments, rather than promoting ownership stability in the industry, and have inflated nursing home rates.

Prior studies of ownership effects on nursing home costs have tended to use pooled estimation techniques in which a series of dummy variables for ownership are entered into a single regression equation. Two recent studies (Arling, Nordquist, and Capitman 1987; McKay 1991) raised questions about the appropriateness of using pooled data in a single regression rather than examining possible interaction effects between ownership and other

independent variables by estimating separate equations. Both studies found evidence of behavioral differences among ownership classes by estimating separate regressions for distinct ownership types.

An additional specification issue concerns the conceptualization of ownership type. Most studies have combined government and freestanding non-profit homes into a single ownership category. This type of specification makes implicit assumptions that government-owned and non-profit homes share common goals and production functions, assumptions that may not be empirically warranted.

These specification issues raise a number of questions addressed by this study: (1) Does ownership class remain an important determinant of nursing home operating costs when costs are disaggregated into patient-related and non-patient-related spending components? To date, empirical studies of nursing home cost behavior have not been able to determine how facilities allocate spending across different components of the reimbursement system. (2) How do nursing home facility sales affect costs, both patient and non-patient related? Do new owners tend to increase spending in patient-related areas as well as spending for capital? (3) Are there behavioral differences between non-profit and government-owned homes that should be explicitly acknowledged in future research on nursing home costs? If important predictor variables differ systematically between government and non-profit homes, future analyses should specify these two ownership types separately.

METHODOLOGY

DATA SOURCE

This study uses 1989 administrative data gathered on an annual basis by the Michigan Department of Social Services, Medical Services Administration (Medicaid), and the Michigan Department of Public Health. Cost data are based on audited cost reports for 393 of the 446 nursing homes in Michigan in 1989. Indicators of facility quality are based on data from the 1989 annual licensing and certification survey conducted by the Michigan Department of Public Health. Omitted from the study are facilities serving only private-pay or Medicare patients, for which cost data were not available.

DEPENDENT MEASURES

The dependent variables were 1989 audited per diem patient costs and per diem plant costs for the 393 nursing homes represented in the study. The Michigan Medicaid reimbursement system is a prospective facility-specific

method, subject to a ceiling set at the 80th percentile for the variable cost component. Variable costs are further divided into two components: base costs that cover activities associated with direct patient care, such as labor costs (excluding administrative personnel), raw and processed food, and certain utilities; and support costs, including administrative salaries and all materials and supplies other than food. The plant cost center contains interest payments on debt, real estate and personal property taxes, and a return on current asset value based on length of ownership (a tenure factor). The tenure factor represents a change instituted in 1985 for freestanding nursing homes where depreciation and a small plant cost profit allowance were replaced by a return on current asset value that increased with length of ownership.[1] The intent of this policy change was to provide a direct incentive for continued ownership versus facility sales.

INDEPENDENT MEASURES

Nursing homes were classified into five distinct ownership groups. Chain ownership was defined as for-profit ownership of five or more facilities, either in-state or nationally ($N = 138$). Individually owned proprietary nursing homes constituted another ownership category ($N = 137$) and included owners with two to four facilities. The remaining three ownership groups were freestanding nonprofit nursing home facilities, including both church and non-church-owned ($N = 60$); hospital long-term care units ($N = 21$); and the government-owned homes–County Medical Care Facilities ($N = 37$).

Change of ownership was measured as a dichotomous variable, indicating whether a facility changed ownership between 1984 and 1989 (scored 1 = yes, 0 = no). While change of ownership has not been included in previous nursing home cost studies, prior research has speculated that the buying and selling of nursing homes has an adverse effect on facility costs because of the increased capital and interest costs recognized by third party payers in the rate-setting process. Whether a facility had been constructed within the preceding five years was included to recognize the higher costs associated with new construction (1 = facilities built within the preceding five years; 0 = facilities older than five years). In-state versus out-of-state ownership was an additional ownership characteristic included in the study (1 = in-state–owned; 0 = out-of-state–owned). The measure was used primarily to identify out-of-state chain ownership, often viewed with suspicion by state regulatory agencies and policy analysts in terms of local accountability and compliance with state and federal regulations. This variable may also serve as a proxy for large- and small-chain ownership, since the majority of out-of-state owners

are large national chains, while most of the in-state chains are providers with only five or six facilities.

This study used average number of deficiencies cited per facility in 1989 as a proxy for nursing home quality, acknowledging the limitations of the measure.[2] A higher number of deficiencies indicated lower-quality care. Percentage Medicaid patient represented the percentage of annual patient days accounted for by Medicaid patient days. Facility size was a continuous variable indicating the number of licensed beds in a facility. Occupancy reflects the facility's reported (and audited) inpatient days as a percentage of the maximum number of bed days, assuming 100 percent occupancy. This variable was used to control for the fact that higher occupancy rates lower per diem facility rates as costs are amortized over a greater number of patients. Regional differences were included in the model to account for geographic variations not otherwise captured in the analysis. The 80 counties in Michigan were grouped into four distinct regions: the Upper Peninsula and northern Michigan represent an essentially rural and economically disadvantaged area; southeastern Michigan (excluding the city of Detroit) is a suburban, affluent region of the state; Detroit is treated as an individual region with its own distinctive urban and political characteristics; and mid-Michigan and the western part of the state comprise the fourth geographic region.

The facility-level case-mix measure was derived from the 1989 Medicare/Medicaid Automated Certification System (MMACS) that reports the percentage of current nursing home residents in a facility with various activities of daily living (ADL) and cognitive deficiencies or who require care for specific problems, such as special skin care or bowel and bladder retraining. An average number of minutes required to care for different types of patients was assigned to the percentage of patients in a facility with those characteristics. This figure was then summed to form a continuous case-mix measure at the facility level. Ten types of care needs or ADL deficiencies were used to develop the case-mix measure.[3] The average case-mix score for all facilities was 86.5, ranging from 43.4 to 131.9.

DATA ANALYSIS

Ordinary least squares (OLS) was used to examine ownership effects on both per diem patient costs and per diem plant costs for the entire sample, using a series of four dichotomous variables for ownership, the usual specification model in nursing home cost studies. A common regression assumes that all observations in the study sample come from the same population. In the nursing home case, such an assumption suggests that all nursing care facilities,

regardless of ownership auspices, share similar patterns of behavior with respect to other important determinants of nursing home costs. Specifically, this means that in a common regression with a series of dummy variables for ownership category, the intercept may differ but the individual coefficients will not vary across ownership categories. Several recent studies (McKay 1991; Arling, Nordquist, and Capitman 1987) found significant behavioral differences among ownership types by estimating separate regression models, differences that would have been obscured by using pooled data with a series of dummy variables for ownership.[4]

RESULTS

The bivariate relationships between ownership types and facility characteristics are presented in Table 1. Hospital long-term care units, county medical care facilities, and the freestanding non-profit homes spend more on per diem patient costs than do proprietary homes. These differences are consistent with prior studies on nursing home cost structures. Contrary to expectations, chain facilities had slightly higher per diem patient costs than did the individually owned for-profit homes. Per diem plant costs, however, were highest for chain facilities and lowest for the hospital long-term care units and the county medical care facilities. Average number of regulatory deficiencies was highest for the proprietary sector, with chain facilities reporting an average of 29 annual deficiencies, followed by the individual for-profit homes with approximately 27 citations. Hospital long-term care units had the fewest, averaging only 13 regulatory deficiencies per year.

Important differences among ownership types were evident in respect to payer mix. Hospital long-term care units and the county medical care facilities provided greater access to Medicaid patients, followed by individually owned for-profits and chain facilities. In this study, which reports data separately for the freestanding non-profit homes and government facilities, non-profit nursing care facilities had the lowest percentage of Medicaid patients, primarily serving instead the private pay market.

The data suggest a generally high level of occupancy across ownership categories, indicating that bed supply in Michigan is constrained. The county medical care facilities and chain-owned homes tended to be the largest facilities, while the hospital long-term care units were, on average, the smallest. There were also differences across ownership classes in respect to certification status. The county medical care facilities and the hospital long-term care units

Table 1: Facility Characteristics by Ownership Type, 1989

Variable	*Chain (n = 138)*	*Individual For-Profit (n = 137)*	*Non-Profit (n = 60)*	*HLTCU* (n = 21)*	*CMCF† (37)*
Per Diem Patient Care Costs	$35.52	$34.29	$44.54	$62.90	$57.45
(s.d. in parentheses)	($ 5.39)	($ 5.37)	($ 8.11)	($12.68)	($ 7.86)
Per Diem Plant Costs	$ 7.06	$ 5.80	$ 5.14	$ 3.91	$ 2.57
(s.d. in parentheses)	($ 2.74)	($ 2.42)	($ 2.99)	($ 1.57)	($ 1.60)
Average Deficiencies	29.00	27.4	24.0	13.14	26.12
Payer Mix					
Percent Medicaid	67.52	69.9	51.88	74.36	72.34
Percent private	22.57	25.2	42.97	13.81	13.67
Percent Medicare	9.91	4.9	5.15	11.83	13.98
Average Occupancy	93.81	93.76	95.16	96.98	97.71
Average Size	122	109	114	69	122
Certification					
Percent SNF/ICF‡	76.0	54.8	66.7	88.0	97.4
Percent ICF only	19.5	40.8	22.2	12.0	0.0
Percent SNF only	3.2	0.6	2.8	0.0	2.6
Percent licensed only	1.3	3.8	8.3	0.0	0.0
Average Case Mix	85.9	84.5	87.4	91.97	94.4
(s.d. in parentheses)	(11.6)	(14.86)	(12.59)	(13.59)	(11.71)
In-State Owner (%)	37.0	98.0	96.7	100.0	100
Ownership Change (%) within Five Years	62.3	28.5	11.7	4.8	0.0
New Facility (%) within Five Years	0.07	5.8	6.7	0.0	2.7

*Hospital long-term care unit.

†County medical care facility.

‡Skilled nursing facility/intermediate care facility.

were more likely to be certified to provide both the skilled and intermediate levels of care, and reported the highest average case mix. Unlike chain ownership, where over three-quarters of the facilities were dually certified, only about half of the individually owned proprietary homes were certified to provide both skilled and intermediate care, suggesting that non-chain proprietary facilities may have chosen to operate in a somewhat different nursing home market than the other ownership classes. The fact that differences in case mix among ownership types were small may be a function of the weakness of the case-mix measure rather than a valid comparison of

resident severity. Reported case-mix differences do, however, approximate differences among provider types in percent Medicare with county medical care facilities averaging the highest case-mix score and the greatest percentage of Medicare days.

With respect to whether facilities had changed ownership or were owned by out-of-state entities, Table 1 shows that none of the county medical care facilities or hospital long-term care units had ownership out of state. The single ownership change that occurred within the hospital long-term care units represented a change from state ownership to non-profit auspices. Of the non-profit freestanding facilities, seven had changed ownership within the preceding five years and two were owned by religious organizations where the provincialate was located in another state. In contrast, for chain nursing homes, 63 percent had out-of-state ownership, and 62 percent had experienced at least one change of ownership between 1984 and 1989. In the individually owned proprietary sector, most facilities were in-state owned (98 percent), and 29 percent had experienced an ownership change in the preceding five years.

Multivariate analyses were conducted at the next stage of analysis to examine ownership effects on both plant costs and patient care costs, controlling for other important determinants of nursing home costs. Using the Chow test (Kmenta 1971), the calculated F for the analysis of per diem plant costs was 34.6 and the calculated F for per diem patient care costs was 33.3, both significant at the 1 percent confidence level, indicating that the calculation of separate regressions by ownership category was the appropriate technique for both analyses. The results of the common regressions using pooled data are also presented for comparative purposes.

PER DIEM PLANT COSTS

Results of the common regression and separate regression for per diem plant costs are shown in Table 2. In the common regression model ("ALL") where individual for-profit homes are the omitted category, ownership characteristics were important determinants of differences in per diem plant costs. Hospital long-term care units and county medical care facilities had significantly lower plant costs than the individual for-profit homes. Chain facilities spent significantly more than the individually owned proprietary homes. Facilities constructed in the preceding five years reported per diem plant costs $4 higher than older facilities, while nursing homes that had changed ownership within the prior five years had significantly higher per diem plant costs than facilities with no change in ownership. As in other cost studies,

higher occupancy was associated with lower spending as costs were amortized over more residents. Per diem plant costs were not related to quality or size in the common regression, nor did percent Medicaid, case mix, or geographic region affect the plant cost component in the common regression.

In the regression for chain-owned homes, the variable stock sale is included to control for the effects of a 1986 corporate sale in which 20 facilities were sold as a transfer of stock rather than a sale of nursing home beds. In a stock sale, reimbursement levels for patient- and non-patient-related costs are unchanged because it is treated as an exchange of stock only, with no effect on nursing home operating costs. As shown in Table 2, in the separate regression for chain homes, a stock sale resulted in per diem plant costs approximately $3 lower than traditional sales of chain facilities because no increased interest costs were recognized in the Medicaid plant cost component.

Ownership change in the separate regressions was significant for all ownership categories, indicating that facilities that change ownership have higher plant costs than facilities without an ownership change, regardless of ownership type. New facility construction was also an important determinant of per diem plant costs for individual for-profit homes, non-profit homes, and county medical care facilities, ranging from $3 per day for the new proprietary for-profit facilities to approximately $7 per day for the newer non-profit homes. The coefficient for new in the regression equation for chain facilities was not significant, but only 2 of the 138 chain-owned homes represented new construction between 1984 and 1989, suggesting that chains are pursuing growth through acquisition rather than new construction.

Because in-state ownership was essentially a proxy for proprietary chain homes, this variable was included only in the separate regression for chain homes. As shown in Table 2, in-state chains had per diem plant costs about $1.45 lower than out-of-state chains. The proxy for quality–number of regulatory deficiencies–was significant only for the individual for-profit ownership category, and was not in the expected direction. That is, higher spending on plant costs was associated with lower quality.

Facility size, occupancy, and percent Medicaid were not important factors in explaining differences in plant costs, with the sole exception of chain-owned facilities. For chains, larger homes, homes with a greater percentage of Medicaid residents, and homes with higher occupancy had a significant negative effect on per diem plant costs. Case mix was significant only for the non-profit homes and the hospital long-term care units. The impact of region on per diem plant costs was insignificant for all ownership categories. In general, Table 2 suggests that differences in spending for per diem plant costs

Table 2: Multiple Regression of Per Diem Plant Costs on Independent Variables (t = values in parentheses)

Independent Variables	*All* n = *393*	*Chain* n = *138*	*Individual For-Profit* n = *137*	*Non-Profit* n = *60*	*HLTCU* n = *21*	*CMCF* n = *37*
Chain	1.04** (3.53)					
Non-profit	−0.28 (−0.76)					
HLTCU	−1.15* (−2.10)					
CMCF	−2.41** (−5.43)					
In-State		−1.45** (−2.96)				
Stock Sale		−3.17** (−4.23)				
Owner Change	1.85** (6.68)	1.76** (3.89)	1.75** (4.26)	2.16* (2.39)	2.78* (2.20)	
New	4.07** (6.34)	0.45 (0.18)	3.00** (3.47)	7.28** (5.20)		6.97** (5.40)
Quality	0.01 (1.28)	0.00 (0.54)	0.02* (2.45)	−0.01 (−0.93)	0.05 (1.45)	0.02 (1.37)
Size	−0.00 (−0.54)	−0.01* (−1.96)	0.00 (0.43)	0.01 (1.37)	−0.00 (−0.06)	0.00 (0.03)
Occupancy	−0.11** (−4.57)	−0.14** (−3.48)	−0.07 (−1.61)	−0.06 (−0.90)	−0.09 (−0.57)	−0.02 (−0.20)
% Medicaid	−0.00 (−0.41)	−0.04* (−2.22)	0.01 (0.41)	0.00 (0.18)	−0.02 (−0.64)	−0.00 (−0.04)
Case Mix	0.01 (1.47)	−0.02 (−1.08)	0.02 (1.48)	0.06* (2.89)	−0.06** (−2.84)	0.01 (0.62)
Detroit	−0.79 (−1.74)	−1.00 (−1.00)	−0.95 (−1.48)	−0.51 (−0.44)		
West/Mid-Michigan	−0.33 (−1.14)	0.27 (0.50)	−0.96 (−1.86)	−0.24 (−0.31)	−0.87 (−0.93)	0.33 (0.71)
Southeast Michigan	−0.36 (−1.05)	0.69 (1.05)	−0.80 (−1.45)	−0.23 (−0.28)		0.24 (0.21)
Intercept	14.58	24.64	9.05	4.16	19.31	2.40
Adjusted R^2	0.40	0.24	0.24	0.56	0.43	0.42
F-Ratio	18.72**	4.54**	4.83**	8.53**	3.14**	4.20**

*$p \leq .05$; **$p \leq .01$.

are accounted for by ownership characteristics such as sales, new construction, and whether a facility is owned in-state or out-of-state, rather than resident or facility characteristics.

PER DIEM PATIENT COSTS

Table 3 presents multiple regression results for the same set of independent variables, using per diem patient costs as the dependent variable. In the common regression model, ownership type was again an important determinant of spending on patient care but in very different ways. The hospital long-term care units, county medical care facilities, and non-profit freestanding homes spent significantly more on patient care than their individually owned proprietary counterparts. Resources allocated to patient care by chains did not significantly differ from the individually owned for-profit facilities.

The impact of ownership change on patient care expenditures differed from the preceding analysis of per diem plant costs where a change of ownership resulted in higher spending for all ownership types. Here the effect of an ownership change was not significant in the common regression or for the separate regressions. Such findings suggest that ownership changes do not result in increased expenditures for patient care; rather, nursing home sales are associated with higher interest costs through capital financing and increased taxes.

Whether a chain nursing home is owned in-state or out-of-state affected spending on per diem patient costs. In-state chains reported per diem patient care costs approximately $2.43 lower than the out-of-state chains. And, as was the case with plant costs, stock sales of chain homes resulted in costs $3 lower than traditional sales within the chain sector. Table 3 suggests that increased spending on patient care is not related to differences in quality for any of the ownership categories. Facility size is positively associated with per diem patient care costs only for the individual for-profits and the county medical care facilities. In the common regression and for chain-owned and proprietary non-chain facilities, occupancy was negatively related to patient care costs.

Table 3 provides some evidence about how nursing home cost structures are affected by the proportion of Medicaid patients. Percent Medicaid was inversely related to spending on patient care in the regression using pooled data and for chains and freestanding non-profit homes. The lack of association between percentage Medicaid and patient care costs for the hospital long-term care units and the county medical care units may be due to the high proportion of Medicaid patients (74.2 percent and 72.3 percent, respectively) served by

Table 3: Multiple Regression of Per Diem Patient Costs on Independent Variables (t = values in parentheses)

Independent Variables	*All* n = *393*	*Chain* n = *138*	*Individual For-Profit* n = *137*	*Non-Profit* n = *60*	*HLTCU* n = *21*	*CMCF* n = *37*
Chain	0.62 (0.78)					
Non-profit	7.97** (7.75)					
HLTCU	30.39** (19.89)					
CMCF	23.79** (19.27)					
In-State		−2.43** (−2.76)				
Stock Sale		−2.97* (−2.20)				
Owner Change	−0.48 (−0.64)	−0.27 (−0.75)	0.38 (0.48)	−3.26 (−1.05)	12.37 (0.88)	
New	0.51 (0.29)	−1.72 (−0.39)	5.03** (2.51)	2.53 (0.53)		−4.04 (−0.78)
Quality	0.01 (0.75)	0.01 (0.96)	0.01 (0.72)	0.01 (0.24)	0.16 (0.38)	−0.09 (−1.77)
Size	0.00 (0.72)	0.01 (1.15)	0.02** (2.97)	−0.02 (−1.20)	0.02 (0.42)	0.04* (2.19)
Occupancy	−0.18** (−2.72)	−0.30** (−4.24)	0.23** (2.50)	−0.12 (−0.51)	0.04 (0.02)	−0.01 (−0.02)
% Medicaid	−0.11** (−5.36)	−0.13** (−4.53)	0.02 (0.66)	−0.14** (−3.56)	−0.61 (−1.54)	0.03 (0.31)
Case Mix	0.06* (2.26)	0.03 (0.97)	0.05 (1.81)	−0.01 (−0.07)	−0.06 (−0.27)	0.19* (2.26)
Detroit	−0.42 (−0.33)	3.90* (2.18)	−2.56 (−1.73)	1.16 (0.29)		
West/Mid-Michigan	1.70* (2.15)	3.43** (3.56)	0.83 (0.70)	3.51 (1.33)	−9.58 (−0.93)	−0.05 (−0.03)
Southeast Michigan	2.28* (2.40)	3.95** (3.35)	−0.35 (−0.27)	4.88 (1.75)		15.44** (3.43)
Intercept	52.41	66.57	3.90	63.02	106.03	34.72
Adjusted R^2	0.70	0.36	0.17	0.30	−0.08	0.62
F-Ratio	65.91**	7.52**	3.71**	3.51**	0.79	8.12**

*$p \leq .05$; **$p \leq .01$.

these facility types. Proprietary non-chains may simply be focusing on the traditional Medicaid market, as suggested by the fact that 41 percent of their facilities are intermediate facilities only. For chains and non-profit facilities, however, where the coefficient for percent Medicaid is significant, decreased spending in the face of a higher Medicaid census may signal a two-tiered system in which residents in facilities with higher Medicaid populations may not be afforded the same level of care as patients in predominantly private-pay homes.

Case mix was significantly associated with spending on patient care for the county medical care facilities only. For the CMCFs, per diem patient costs increased as level of case mix increased. Also, geographic region affected spending on patient care. Chain homes located in southeastern Michigan, western / middle Michigan, and Detroit reported higher per diem patient care costs than chain homes located in the less affluent, rural upper area of Michigan.

The lack of significance for the hospital long-term care unit model suggests that there may be important omitted variables in explaining variation in spending on patient care by HLTCUs. Alternatively, the small sample size ($N = 21$) for the HLTCU model may account for the insignificant F-ratio for the patient care regression.

DISCUSSION

Much of the previous research on nursing home costs (Weisbrod and Schlesinger 1986; Arling, Nordquist, and Capitman 1987) documents significant behavioral differences between non-profit and for-profit nursing care facilities. Proprietary homes–in particular, chain-owned facilities–have been found to have the lowest operating costs of all ownership types, to decrease spending as the percentage of Medicaid patients increases, and to be relatively insensitive to case-mix variations. Non-profit homes, on the other hand, have been found to allocate more resources as resident case-mix needs increase and not to cut spending as the proportion of Medicaid patients increases (Arling, Nordquist, and Capitman 1987).

In contrast, the results of this study suggest that behavioral differences tend to differentiate the government-owned and hospital-based facilities from the freestanding homes rather than the usual distinction between for-profit and not-for-profit ownership classes. Variables traditionally included in nursing home cost studies such as percent Medicaid and case mix were found to

have similar effects on per diem patient costs for both freestanding nonprofit homes and chain-owned facilities. Why individual for-profit homes do not reduce patient care spending in the face of a higher Medicaid census is not clear. It may be due, however, to an increasingly competitive market for private-pay patients in which individual proprietary homes are unable to compete effectively, leaving them to operate in the traditional long-term care Medicaid market.

The importance of model specification is particularly evident in considering study findings regarding freestanding non-profit homes. Most empirical studies of nursing homes have combined non-profit and government-owned homes into a single ownership category. Such studies have reached favorable conclusions about the role and performance of the non-profit sector in contrast to for-profit nursing care facilities, particularly in respect to access for Medicaid patients and quality of care. The present study, however, separating government-owned and non-profit facilities into distinct ownership categories, found that non-profit homes serve the highest percentage of private-pay patients, which may account for the consistently higher spending reported by non-profit facilities. Study findings also suggest a negative relationship between percent Medicaid and patient care costs for non-profit as well as for chain providers. In addition, only the county medical care facilities are sensitive to case mix in respect to spending for patient care, a finding that would be obscured by the usual specification model combining non-profit and government-owned facilities. The generally insignificant effects of case mix and quality on per diem patient care spending could be due to limitations in the measures used in this study. Future research on nursing homes will be enhanced by the development of more valid measures of quality and case mix based on data from the Minimum Data Set (MDS).

The fact that freestanding non-profit facilities behave more like their proprietary counterparts than like government or hospital-based facilities may be due to the changing market for nursing home care in the United States. Throughout the last decade, state Medicaid programs have exerted increasing pressure on the nursing home industry to contain costs. Cost-containment programs such as prospective payment systems, the institution of cost ceilings, and certificate-of-need programs have limited the flow of Medicaid dollars into the nursing home sector, and in many cases, nursing home providers have had to redefine their market. There is evidence that many of the national chains have opted to change their business strategy from one that focuses on the lower-cost Medicaid market to increasing their private-pay census (Wagner 1987). National chains have sold facilities in states with low Medicaid

reimbursement, moving into states where private-pay patients comprise a greater share of the nursing home market. Such market restructuring on the part of corporate chains has intensified competition within the nursing home market and may account for the growing similarity between for-profit and non-profit facilities–the fact that non-profits increasingly look like "for-profits in disguise" (Harrington 1984).

Within the proprietary sector itself, concerns about the growing representation of chain-owned facilities in the nursing home industry were not substantiated. Results indicate that chain facilities do not have lower costs than individual for-profit homes with respect to spending on patient care. These findings are consistent with some previous studies (Birnbaum et al. 1981; Meiners 1982; Schlenker and Shaughnessy 1984; Cohen and Dubay 1990) and differ from others (Arling, Nordquist, and Capitman 1987; Nyman 1988; McKay 1991). Differences in specification of the omitted ownership category in the regression model account for much of the variation. Each of these studies reports different findings on the behavior of chain-owned facilities, depending on the omitted category and how non-profit and government ownership are specified. Study results further suggest interesting differences in the cost behavior of in-state versus out-of-state–owned chains. Higher spending on patient care by out-of-state chains may indicate further economic sorting in the nursing home industry, with larger national chains better positioned financially to compete for the private-pay market. Future analyses should include size of chain to model probable differences in the goals and behaviors of larger versus smaller nursing home chains.

In regard to the effects of ownership change and new construction, all nursing home ownership types tend to behave in similar ways. While facility sales increase plant costs, they do not result in additional spending for patient care costs. The increased interest costs recognized by the state in setting capital reimbursement rates continue to reward facility sales without a concomitant increase in spending on direct patient care. Although empirical research has yet to establish a direct connection between spending and quality of care, such reimbursement policies mean that state Medicaid programs pay to repurchase the same buildings and equipment for facilities that change ownership.

While facility sales have similar effects for all ownership types, frequent sales remain a characteristic of the proprietary sector, particularly for chains. Between 1984 and 1989, almost two-thirds of the chain-owned facilities and about 30 percent of the individually owned proprietary facilities had been sold at least once, suggesting that plant costs continue to be differentially affected by ownership auspices, and that the 1985 replacement of depreciation costs

with a tenure factor for freestanding facilities in Michigan was not entirely successful in reducing facility sales. Since 1989, facility sales in Michigan continue to average two to three per month, including sales of two major national chains during this time period.

Despite the addition of a tenure factor as an incentive for stability of ownership in the proprietary sector, per diem capital reimbursement for interest and property taxes resulting from a facility sale is higher than the per diem plant reimbursement based on long-term ownership. The Michigan experience suggests that system changes that retain interest payments as an allowable plant cost expense continue to provide a positive incentive for facility sales.

Although systematic studies of different state capital reimbursement systems are not available, information from the American Health Care Association (AHCA) suggests that in 1995 the majority of states were still following the traditional cost-based model of capital reimbursement in which interest, depreciation, and property taxes are recognized. Although this study does not establish an empirical relationship between facility sales and declines in quality, the results do suggest perverse economic incentives operating in state Medicaid capital reimbursement systems–incentives that favor frequent ownership changes in the proprietary sector of the nursing home industry, thereby increasing costs to state Medicaid programs. Studies are needed to examine the effects of changes in the way capital costs are reimbursed in states that have moved from traditional cost-based reimbursement to newer models, such as the fair rental system in which both depreciation and interest have been replaced by determining a fair rental value based on the current asset value of the facility. Whether alternative methods of treating facility sales promote stability of ownership in the industry and decrease costs to state Medicaid programs is an important public policy question.

NOTES

1. Plant costs for county medical care facilities and hospital long-term care units were reimbursed under the old system, which recognized depreciation, interest expenses, and relevant taxes. A grandfather clause enabled freestanding facilities receiving higher plant reimbursement under the old system to retain the current rate until their plant reimbursement calculated under the new system exceeded the current rate. In 1989, approximately 93 of the 334 freestanding facilities included in this study continued to be reimbursed under the old system. Of these 93 homes, a third were facilities owned by a large national chain that sold all of its nursing homes in Michigan in late 1989.

2. In the absence of valid, resident-level measures of nursing home quality, researchers have used different measures. Some studies use staff:patient ratios, in particular the ratio of RNs to patients, as the proxy for quality (Lee, Birnbaum, and Bishop 1983; Cohen and Dubay 1990; Fottler, Smith, and James 1981), while other studies employ regulatory deficiencies or number of complaints as indicators of quality (Nyman 1988; Weisbrod and Schlesinger 1986). While regulatory deficiencies do not measure individual resident outcomes against a standardized norm, they do at some basic level assess a facility's overall performance in providing adequate and humane care to nursing home residents. Surveyors evaluate the cleanliness and safety of the home and assess resident care status.
3. This case-mix index, including the conditions used and the average minutes of care required for each condition, was modeled on a long-term care case-mix measure used by Cohen and Dubay in their 1990 national study of nursing home quality, costs, and case mix, an index they adapted from the West Virginia Medicaid program.
4. The method for determining whether it is methodologically appropriate to estimate separate regressions for ownership category is the Chow test (Kmenta 1971). This test takes the difference between the residual sums of squares of the common regression model and the sum of the residual sums of squares for the separate regressions to determine whether the obtained F-ratio is statistically significant.

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