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RESEARCH ARTICLE

Private Investment Purchase and Nursing Home Financial Health

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Objective. To explore the impact of nursing home acquisition by private investment firms on nursing home costs, revenue, and overall financial health.

Data Sources. Merged data from the Medicare Cost Reports and the Online Survey, Certification, and Reporting system for the period 1998–2010.

Study Design. Regression specification incorporating facility and time fixed effects.

Principal Findings. We found little impact on the financial health of nursing homes following purchase by private investment companies. However, our findings did suggest that private investment firms acquired nursing home chains in good financial health, possibly to derive profit from the company's real estate holdings.

Conclusions. Private investment acquired facilities are an important feature of today's nursing home sector. Although we did not observe a negative impact on the financial health of nursing homes, this development raises important issues about ownership oversight and transparency for the entire nursing home sector.

Key Words. Private investment, nursing homes, financial health, costs

The role of for-profit companies in the nursing home industry is long-standing, with nearly two-thirds of nursing homes operating on a proprietary basis (Kaffenberger 2000; Jones 2002). However, the recent trend of private investment transactions in the nursing home sector has renewed questions regarding oversight and accountability.[1] Beginning in 2000, private investment firms with limited previous experience in the nursing home industry began playing a more prominent role in acquiring nursing homes. The term "private investment" refers to a range of investments (e.g., venture capital, leveraged buyouts) not tradable on public stock markets (Jensen 2007). Initially, private investment in the nursing home sector centered around the purchase of selected, financially underperforming facilities. The majority of these transactions occurred in Florida between 2000 and 2003, where liability costs and malpractice premiums were much higher than in other parts of the country.

From 2003 to 2007, private investment firms purchased several large, for-profit nursing home chains, targeting companies with major real estate holdings. The private investment firms generally separated the real estate capital from the nursing home operations, leveraging the real estate assets to help finance the deal (Stevenson and Grabowski 2008).

Both the involvement of investors with no apparent industry experience and the movement toward complex, nontransparent corporate structures raised concerns regarding the impact of these transactions on quality of care. A 2007 article in *The New York Times* detailed deficiencies in nursing homes acquired by private investment firms and initiated a strong response from a range of stakeholders, including consumer advocates, labor unions, and the federal government. The empirical evidence concerning the impact of private investment in the nursing home sector has been mixed to date (Harrington et al. 2012). Although some analyses of limited scope identified quality problems in the wake of private investment deals (Testimony before the U.S. House Committee on Ways and Means by Charlene Harrington and Arvid Mueller, November 15, 2007), others did not find such an impact (Florida Agency for Health Care Administration 2007). Similarly, a previous article focusing on all private investment transactions nationally analyzed the initial impact of private investment in the nursing home sector, looking at changes in occupancy, payer mix, staffing, and quality indicators relative to the private investment deals (Stevenson and Grabowski 2008). The analyses found little evidence to suggest that nursing home quality worsened following purchase by a private investment firm. Although some declines in staffing were observed, these appeared to be part of a larger trend that predated the involvement of private investment firms. Finally, the U.S. Government Accountability Office (GAO) recently completed its own assessment concerning the identification and impact of these deals in the nursing home sector (GAO 2010, 2011). Although the GAO analyses identified differences in private investment owned facilities in the pre- and postdeal periods, their work did not disentangle the independent effect of private investment ownership on nursing home quality of care.

We are only aware of one previous publication focusing on private investment transactions and nursing home financial performance. In a study

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of for-profit chain nursing homes in Florida over the period of 2000–2007, Pradhan et al. (2013) employed a random effects regression specification to analyze a range of financial outcomes, including operating revenues and costs and operating and total margins. The authors concluded that Florida facilities undergoing a private investment transaction experienced improved financial performance following the deal.

In this study, we seek to explore the impact of nursing home acquisition by private investment firms on nursing home costs, revenue, and overall financial health. Our article offers several contributions to the existing literature in that we employ a fixed effects differences-in-differences regression specification with national Medicare Cost Report data over the period 1998 through 2010.

Conceptual Framework

Sloan and colleagues (2003) generated a conceptual framework for analyzing hospital ownership conversions and closures. The basic implication of their model is that—holding other factors constant—poorly run facilities with low profit margins are more likely to undergo some type of transaction. The authors hypothesized that ownership changes were most likely at low or slightly negative margins, while very negative margins would be predictive of closure. Private investment nursing home acquisitions are somewhat different than more general health care ownership conversions. Although these deals include some "fire-sale" properties in poor financial condition, they also include deals targeting nursing home chains with strong real estate holdings. Often times, the private investment company will use the real estate assets to help finance the deal.

The effect of these private investment deals on nursing homes' financial performance remains somewhat unclear. Many of the private investment groups lack previous experience in the nursing home sector, but they typically contract with a separate operating company to manage the facility. The operator, which could be the same operating entity as before the deal, will pay rent to the private investment firm and typically take responsibility for all expenses associated with the property, including operating expenses, property taxes, and capital improvements. Given this arrangement, it is hard to predict how private investment firms' lack of nursing home experience will impact the financial health of the acquired facilities.

The typical goal of the private investment group is to sell the holding after a relatively short period of time (Private Equity Council 2008). As such,

private investment firms have a financial incentive to maintain the financial health of their facilities for sale, including the maintenance of revenue streams that depend on providing sufficient care to their residents. Nonetheless, the strategic emphasis of an investor-owner is likely different from that of a nursing home owner with a longer term business plan. For example, private investment firms would be less likely to make large capital or strategic investments that might not pay off in the short term.

Thus, we hypothesize that the majority of financial measures will be similar for nursing homes following acquisition by a private investment firm relative to comparable facilities that do not undergo such transactions. In particular, measures such as payer mix, revenue, facility size, staffing, and occupancy should be similar following private investment acquisition. Alternatively, because of the shorter time horizon expected with private investment ownership, financial measures such as costs and operating margin have the potential to be different. In particular, private investment owned nursing homes might be expected to have lower costs and higher operating margins due to a lack of investment in the longer term fiscal health of the operation. Similarly, if private investment firms leverage the real estate assets and take on more debt, then we would expect a higher debt servicing cost in those facilities.

METHODS

Data

We used two primary sources of nursing home data in this study period. The first source is the Medicare Cost Reports (MCRs), which contain itemized utilization and cost allocation data for skilled nursing facilities. All Medicare-certified skilled nursing facilities are required to submit an annual MCR. Second, we used data from the Online Survey, Certification, and Reporting (OSCAR) system, which contains survey and certification data for all Medicaid- and Medicare-certified facilities in the United States. OSCAR surveys are conducted roughly annually, although a facility can be surveyed multiple times in a year or not at all. MCR and OSCAR data from 1998 through 2010 were merged for each nursing home using the common provider identification number. After annualizing all values within the Medicare cost reports, we matched the first OSCAR survey conducted during the reporting period. If an OSCAR survey was not conducted during the reporting period, we matched the closest OSCAR survey to the reporting survey.

Coding Private Investment Transactions

We identified private investment transactions in the nursing home sector based on prior study in this area (Stevenson and Grabowski 2008). We included private investment transactions between 2000 and 2007, a period that encompassed the majority of recent activity by private investment firms in the nursing home sector. As previously noted by Stevenson and Grabowski (2008), some transactions during this period included only select facilities, while others included entire chains. For the present article, we limited our analyses to entire-chain transactions, which include the overwhelming majority of facilities involved across all transactions. We cross-checked the deals we identified with those documented by the GAO in their similarly focused 2010 report. Annual observations for facilities involved in chain-wide transactions were coded as "pre" or "post" transaction based on the effective dates of the deals. To distinguish general trends in nursing home financial health from the effects of the transactions more precisely, we also coded annual observations for facilities involved in chain-wide transactions relative to the deal date, spanning 3 or more years prior to the deal through 4 or more years following the deal.

Outcomes

We estimated models using measures from the MCR and OSCAR data. From the MCR, we include total operating expenses (the resources required to run the facility) and total revenue (the income generated as a result of services provided). We converted these measures to 2013 dollars using the overall CPI-U index. The MCRs include cost and revenue data broken down by cost center. We estimated models using other cost and revenue measures; however, we do not report these additional measures as they were correlated with total operating expenses and total revenue, respectively, and did not provide novel information (results available upon request). To account for variation in facility size, cost and revenue measures were standardized per resident day using the MCR. To eliminate outliers due to obvious reporting errors, observations for which the number of annual resident days exceeded 438,000 (the equivalent of a 1,200-bed nursing home with 100 percent annual occupancy) were excluded from the analyses. After merging and data cleaning, the analyses included a total of 163,214 facility-year observations.

We examined outcomes related to financial health, including the facility's current ratio, operating margin, and debt servicing coverage ratio. The current ratio compares short-term assets (cash, inventory, receivables) to short-term liabilities (debts and payables) and serves as an indicator of liquidity. Low liquidity indicates an inefficient operating cycle and increased risk of bankruptcy (Wedig, Hassan, and Morrisey 1996; Bowblis 2011). Following the methodology employed by Bowblis (2011), we used the current ratio from the MCR to create three dichotomous variables: current ratio ≥2 (high liquidity), current ratio <2 and ≥1 (medium liquidity), and current ratio <1 (low liquidity). The operating margin looks at profit as a proportion of total revenue, and it serves as an indicator of profitability. Again, consistent with Bowblis (2011), we used the operating margin variable from the MCR to create two dichotomous variables: operating margin >5 percent (high profitability) and operating margin <0 (negative operating margin). Another key financial measure is the debt servicing coverage ratio, which is equal to 100 times the ratio of cash to interest on debt and debt principal. Unlike the current ratio measure, this measure provides information about long-term debt. We split this measure into three dichotomous variables: debt servicing = 0, debt servicing >0 and <10, and debt servicing ≥10.

Preliminary analyses revealed that some of the MCR variables had large standard errors. To minimize the influence of outliers for the continuous MCR variables (e.g., total operating expenses and total revenue), values greater than four standard deviations from the mean were set to missing.

From OSCAR, we examined nursing home characteristics, including the number of beds, occupancy rate, and proportions of residents who relied primarily on Medicaid and Medicare. We also examined registered nurse (RN), licensed practical nurse (LPN), and nurse aide staffing measures, all standardized by hours per resident day.

Covariates

All the regressions control for a series of covariates. At the facility level, we control for the presence of dementia special care unit, bed size, acuity index, and the average number of limitations in activities of daily living. At the market level, we control for a county-level Herfindahl Index (sum of squared market shares), which measures market concentration and serves as a proxy for competition. Those facility-level factors that are time invariant (e.g., urban location) are captured by our inclusion of a facility fixed effect in the model.

Statistical Analysis

To ascertain if nursing homes affiliated with chains that were subsequently acquired by a private investment firm differed at baseline (1998) from nursing homes not involved in such a transaction, we compared these facilities to three alternate ownership categories: (1) all other nursing homes; (2) all other for-profit nursing homes; and (3) all other for-profit chain nursing homes. Continuous variables were reported as means for all ownership categories, and comparisons between private investment facilities and the three alternate ownership categories were made using *t*-tests. Dichotomous variables were reported as frequencies, and comparisons were made using Pearson chi-square tests.

To examine the impact of private investment firm ownership on our outcomes measures of interest, we estimated regression models that included a set of time-varying nursing home traits, facility-level fixed effects, and year dummies. The basic specification is a "difference-in-differences" model in which we compare the difference in pre-post financial outcomes for facilities acquired by a private investment firm against the pre-post difference for facilities not acquired. We present results from two different model specifications: a "pre/post" model in which the key explanatory variable of interest is an indicator identifying "post" observations for facilities involved in a private investment transaction; and a second specification in which the key explanatory variables of interest are periods preceding and following the deal. For the latter, a set of pre- and postdeal terms spanning 2 years prior to the deal through 4 or more years following the deal are compared to observations 3 or more years prior to the deal. To account for industry trends, the analyses use several different comparison groups that did not undergo a private investment deal: all other nursing homes, all other for-profit nursing homes, and all other for-profit chain nursing homes. These analyses produced comparable results, and we present only the regression results that included only the for-profit chain facilities in the comparison group, as these facilities are most similar to those facilities purchased by private investment firms.

The facility, staffing, and cost models were estimated using least squares regression; the four models of nursing home financial health were estimated using conditional logistic regression. We clustered the standard errors in the regressions at the level of the facility. All analyses were conducted using *Stata*, version 11 (StataCorp LP, College Station, TX, USA). Specifically, for the regression analyses, we used the areg command for the least squares models and the clogit command for the conditional logit models.

RESULTS

Table 1 summarizes the major, entire-chain private investment transactions that occurred in the nursing home industry between 2000 and 2007. We identified 11 transactions involving 1,555 facilities. As a benchmark, approximately 12,000 Medicare-certified, freestanding, and non-government-owned nursing homes were in operation in the United States at the beginning of our study period in 1998. The deals ranged in size from chains encompassing 16 facilities (Formation Capital/JER Partners acquisition of Meridian in 2005) to 340 facilities (Pearl Senior Care/Filmore Capital Partners acquisition of Beverly in 2006). In Figure S1, we show the distribution of facilities by ownership type over the study period among Medicare-certified, freestanding, and non-government-owned facilities. The proportion grew from 0 percent in 1998 to 10 percent by 2010.

Table 2 presents the baseline comparison of nursing homes affiliated with chains subsequently acquired by private investment firms to three alternate ownership categories: (1) all other nursing homes; (2) all other for-profit nursing homes; and (3) all other for-profit chain nursing homes. Although facilities that subsequently underwent transactions were comparable in size to the other facility categories, they had significantly higher occupancy, a lower proportion of Medicaid residents, and a higher proportion of Medicare residents. Staffing levels did not generally vary across facility categories at baseline. Nursing homes subsequently acquired by private investment firms

Table 1: Summary of Private Investment Transactions

Nursing Home Company	*Private Investment Group*	*Transaction Date*	*No. Facilities Included*
Centennial Healthcare	Warburg Pincus	February 25, 2000	96
Integrated Health Services	Abe Briarwood/National Senior Care	January 22, 2003	191
Mariner Health Care	Abe Briarwood/National Senior Care	December 10, 2004	266
Meridian	Formation Capital/JER Partners	September 1, 2005	16
Skilled Healthcare Group	Onex Partners	December 27, 2005	65
Beverly Enterprises	Pearl Senior Care/Filmore Capital Partners	March 14, 2006	344
Laurel Healthcare	Formation Capital/JER Partners	May 1, 2006	44
Tandem Health Care	Formation Capital/JER Partners	July 12, 2006	43
Genesis Healthcare	Formation Capital/JER Partners	January 16, 2007	182
Trilogy Health Services	Lydian Capital	October 5, 2007	59
HCR Manor Care	Carlyle Group	December 21, 2007	301

Table 2: Mean Nursing Home Characteristics by Ultimate Ownership Category at Baseline (1998)

Facility Variables	*Nursing Homes Bought by PI Firm*†	*All Other Nursing Homes*‡	*Other For-Profit Nursing Homes*§	*Other For-Profit Chain Nursing Homes*¶
Total beds	120.4	119.1	115.4***	112.84***
Occupancy (%)	84.5	82.8***	81.8***	80.9***
Percent Medicaid (%)	63.2	64.7**	67.8***	68.1***
Percent Medicare (%)	13.0	9.6***	9.7***	10.2***
Registered nurses (hours per resident day)	0.45	0.50	0.48	0.46
Licensed practical nurses (hours per resident day)	0.76	0.79	0.79	0.81
Nurse aides (hours per resident day)	2.11	2.22**	2.13	2.09
Financial variables				
Total operating expenses††	126.15	125.75	123.26***	124.09**
Total revenue††	164.24	144.26***	144.21***	145.60***
Current ratio ≥2 (%)	16.5	30.7***	32.9***	33.7***
Current ratio ≥1 and <2 (%)	28.5	34.8***	33.7***	30.5
Current ratio <1 (%)	55.0	34.5***	33.4***	35.8***
Negative operating margin (%)	25.8	57.0***	52.2***	54.7***
Operating margin >0% and ≤5%	20.1	23.1**	24.4***	22.9**
Operating margin >5%	54.1	19.9***	23.4***	22.4***
Debt servicing cost = 0 (%)‡‡	65.8	49.0***	46.1***	49.3***
Debt servicing cost >0 and <10 (%)	24.1	29.8***	31.8***	34.0***
Debt servicing cost ≥10 (%)	10.1	21.3***	22.1***	16.7***
N	1,382	10,415	7,469	4,964

Note. Significance denotes a statistically significant difference, using facilities purchased by a PI firm as the comparison group.
†Includes all facilities subsequently bought by a private investment (PI) firm.
‡Includes all facilities not bought by a PI firm.
§Includes all for-profit facilities not bought by a PI firm.
¶Includes all for-profit, chain facilities not bought by a PI firm.
††Standardized per bed-day and adjusted to 2013 dollars.
‡‡Debt servicing cost = 100 × (cash on hand/(debt interest + debt principal)).
**Statistically significant at 5% level.
***Statistically significant at 1% level.

appeared to be in relatively strong financial health. They had significantly higher total revenue at baseline than other nursing homes. In addition, facilities that subsequently underwent transactions had significantly greater liquidity (higher proportion of facilities with current ratio ≥2, and lower proportion

of facilities with current ratio <1), profitability (higher proportion of facilities with operating margin >5 percent, and lower proportion of facilities with operating margin <0), and long-term debt (greater proportion of facilities with no debt servicing costs) than all other categories.

Table 3 presents the adjusted regression results of nursing home outcomes as a function of private investment deals. The comparison group in these regressions is all for-profit chain facilities that were not acquired by a private investment company over our study period. The first column presents the results from the aggregate "pre/post" difference-in-differences model, while the latter columns present results from the model specification, including terms from the periods preceding and following these deals. The comparison group for the second model specification is observations 3 or more years prior to the deal.

The second model specification indicates a modest but statistically significant increase in the proportion of Medicaid residents following purchase by a private investment firm. However, this increase began prior to facilities' purchase by private investment firms, suggesting the change was part of a more general trend in these facilities (and not directly related to the deal itself). The proportion of Medicare residents appeared to decrease following purchase by a private investment firm. Although the majority of terms in the second model specification were not statistically significant, this trend also began prior to facilities' purchase by private investment firms. The occupancy rate increased in the years before and after private investment deals.

The "pre/post" model specification did suggest an increase in RN staffing and a decrease in nurse aide staffing following purchase by a private investment firm. The second model specification suggested a significant decrease in nurse aide hours per resident day in the year prior to the deal through 4 or more years following the deal, but again this appears to be part of a more general trend and not related to the deals.

Both model specifications reveal a statistically significant increase in total operating expenses following purchase by a private investment firm. However, as was the case for the facility and staffing variables detailed above, the second model specification indicates that this trend preceded the transaction and was not related to acquisition by a private investment company. The pre/post specification suggests total revenue declined following the deal, although the pre/post specification does not suggest a direct link to the timing of the deal.

Both model specifications indicate significant declines in liquidity following purchase by a private investment firm. The proportion of nursing

Table 3: Private Investment Deals and Nursing Home Outcomes, Adjusted[†] Regression Results (For-Profit Chain Facilities Only[‡]) ($N = 56{,}461$)

	Model 1: Pre/Postterm	*Model 2: Set of Pre- and Postterms*[§]					
Facility Variables	*Post*	*Pre 2*	*Pre 1*	*Deal*	*Post 1*	*Post 2*	*Post 3+*
Occupancy (%)	0.4	1.4***	1.2***	1.0**	1.2***	1.2***	0.4
Percent Medicaid (%)	0.4	1.0***	0.7**	0.5	0.8**	0.8**	0.8**
Percent Medicare (%)	−0.3	−0.03	−0.02	−0.2	−0.2	−0.2	−0.5*
Registered nurses (hours per resident day)	0.03**	−0.005	0.02	0.04*	0.03*	0.05*	0.03
Licensed practical nurses (hours per resident day)	−0.002	−0.007	−0.01	−0.006	−0.003	−0.006	−0.009
Nurse aides (hours per resident day)	−0.04**	−0.04*	−0.02	−0.03	−0.07***	−0.07**	−0.05**
Financial variables							
Total operating expenses[¶]	2.01***	4.55***	4.91***	−10.76***	6.84***	7.40***	8.82***
Total revenue[¶]	−4.87***	3.15***	−0.32	−23.75***	−2.82**	2.60*	2.78*
Current ratio <1	3.65***	0.51***	0.47***	1.00	2.89***	2.74***	4.97***
Current ratio ≥1 and <2	1.47***	1.13*	0.83**	1.03	1.47***	1.95***	1.53***
Current ratio ≥2	0.27***	1.44***	2.07***	1.10	0.35***	0.24***	0.14***
Negative operating margin	1.92***	0.88	1.72***	2.07***	2.12***	2.14***	2.08***
Operating margin >0% and ≤5%	0.93	1.78***	1.60***	1.51***	0.97	1.03	1.13*
Operating margin >5%	0.56***	0.56***	0.37***	0.32***	0.50***	0.45***	0.41***
Debt servicing cost = 0[††]	0.38***	1.37***	0.92	0.48***	0.37***	0.40***	0.36***
Debt servicing cost >0 and <10	1.97***	0.78***	1.23**	0.93	1.75***	2.02***	3.00***
Debt servicing cost ≥10	2.18***	0.75***	0.85	3.06***	2.44***	1.96***	1.42***

Note. [†]Adjusted models controlling for bed size, presence of dementia special care unit, facility-level acuity index, limitations in activities of daily living, and a county-level Herfindahl index measuring market concentration. Adjusted models also include facility-level fixed effects and year dummies. All continuous variables were estimated using least squares regression with robust standard errors clustered at the facility level, and the results are presented as coefficients. All models with dichotomous outcomes were estimated using conditional logistic regression, and the results are presented as odds ratios.
[‡]Analyses limited to nursing homes that were part of a for-profit chain.
[††]Debt servicing cost = 100 × (cash on hand/(debt interest + debt principal)).
[§]The comparison group for each Model 2 regression is observations three or more years prior to the deal.
[¶]Standardized per bed-day and adjusted to 2013 dollars.
*Statistically significant at 10% level;
**Statistically significant at 5% level;
***Statistically significant at 1% level.

homes with a current ratio ≥2 (indicating high liquidity) decreased following the deal, while the proportion of nursing homes with a current ratio <1 (indicating low liquidity) increased following the deal. Moreover, the second model specification reveals that the deal year appears to mark an inflection point in liquidity, where the years leading up to the deal show significantly increasing liquidity, and the years following the deal show significantly decreasing liquidity. The "pre/post" model reveals a similar trend for profitability: the proportion of nursing homes with an operating margin >5 percent (indicating high profitability) decreased following the deal, while the proportion of nursing homes with a negative operating margin increased following the deal. However, it appears from the second model specification that the profitability trends began prior to facilities' purchase by a private investment firm. Finally, the debt servicing results suggested that the proportion of facilities with greater long-term debt increased, while the proportion with no debt decreased. The pre/post model reveals that the deal year serves as an inflection point, suggesting a direct relationship between the private investment deals and the level of long-term debt.

Sensitivity Analyses

We ran a number of models to check the robustness of our primary results. All of these results, available in the online appendix (see Tables S2–S4), are consistent with the primary findings of our study. First, we reestimated our models by including two state-level regulatory measures: the state minimum staffing standard (Grabowski et al. 2011) and the Medicaid payment rate (Grabowski et al. 2008). Second, we constructed an alternate comparison group based on a 10 : 1 propensity score matching algorithm. We used all the variables included in the model along with baseline values of the quality measures. Third, although we excluded several of the facility-level variables (payer mix; occupancy; staffing) from the independent variable set in the facility outcomes model due to endogeneity concerns, we incorporated them as additional covariates in our model as a sensitivity check.

DISCUSSION

The acquisition of large nursing home chains by private investment companies has been an important concern for policy makers (GAO 2010, 2011). Given the involvement of investors with no apparent industry experience and the

movement toward less transparent corporate structures, some stakeholders have been concerned that private investment firms would attempt to increase profitability by cutting costs in a manner that compromised resident care. Yet previous research using national data observed little impact on nursing home quality immediately following these deals (Stevenson and Grabowski 2008). This article adds to the literature by including more years of follow-up and incorporating outcomes such as operating expenses that are more easily manipulated to achieve financial ends. Even with a longer period of follow-up and the focus on these financial outcomes, acquisition by a private investment firm did not appear to impact resident care in the acquired nursing homes.

Although the deals had little impact on financial outcomes, our study does provide insights into the strategy of private investment companies in the nursing home sector. We found that nursing homes acquired by private investment firms differ from other nursing homes at baseline, such that nursing homes associated with chains that were subsequently acquired by private investment firms had significantly higher occupancy, a lower proportion of Medicaid residents, a higher proportion of Medicare residents, lower total operating expenses, higher total revenue, greater liquidity, and greater profitability than their counterparts. It is possible that these factors motivated the private investment deals. Unlike a typical leveraged buyout where a private investment firm seeks to acquire, improve, and resell for profit an underperforming company, our findings suggest that private investment firms operating in the nursing home sector identified nursing home chains in relatively good financial health and sought to derive profit from the company's real estate holdings, which allowed firms to leverage substantial debt at historically low interest rates.

This conclusion is further supported by our findings related to liquidity, the only measure of nursing home financial health that significantly changed following acquisition by a private investment firm independent of prior trends. We observed a significant decrease in liquidity in the years following the deal, indicating a shift in the current ratio (ratio of short-term assets to short-term liabilities). Although the exact financial mechanisms remain unknown, it follows that the removal of real estate assets or the additional expense of leasing real estate would influence a nursing home's current ratio in the manner observed, even in the absence of other operational changes.

Moving forward, private investment will remain an important feature of the nursing home sector, with publicly traded companies owning and operating a smaller number of facilities. Private investment acquisitions have begun

to increase again in recent years following a lull. Moreover, because private investment firms often do not keep their holdings for a long period of time, we hypothesize that we will begin to see transactions involving many of the chains acquired by private investment firms, either through private resale or public offerings.

In the context of this evolving market, a key question is what is the role for public policy? On the one hand, our article and earlier national studies have suggested little impact of these private investment deals on the delivery and quality of nursing home services. On the other hand, the monitoring of all facilities, including those acquired by private investment firms, should continue in the coming years. Based on our results, it is difficult to conclude that private investment facilities warrant additional scrutiny relative to other facilities. However, oversight should be sufficient such that policy makers can detect and address any emerging differences in performance associated with these deals. To make this determination, policy makers will need to continue to invest in data to identify the nature of these corporate structures. The Affordable Care Act (ACA) now requires Medicaid/Medicare-certified nursing homes to have available for inspection ownership and other disclosable party information. Regulators will need to use these data to track nursing home performance over time.

From the consumer perspective, greater transparency in ownership might also be valuable in choosing a nursing home. The ACA mandated that nursing homes make ownership information available to the public via a standardized form by March 2013. Whether and how consumers use this information is an open issue for future research. One idea is to release detailed ownership information on Nursing Home Compare, the government's report card website. Currently, the website gives organizational information regarding type of ownership (for-profit, nonprofit, government) and chain membership, but the availability of detailed ownership information—for all nursing homes, regardless of ownership type—would be an important step toward increasing transparency.

This study has several limitations. This is the first study to explore nationwide private investment deals using data from the MCR, and it remains unclear if the organizational complexity introduced by these deals influenced financial reporting and compromised the validity of the MCR variables. Consistent with the methodology employed by Bowblis (2011), we utilized dichotomized measures of financial health (e.g., profitability, liquidity) to diminish the influence of outliers. A second limitation is that we were not able to cluster our standard errors at the chain level. For this project, we have coded up only

the 375 largest for-profit chains in the country. In a check with these chains, clustering our standard errors at the level of the chain increased our standard errors by 15–88 percent depending on the outcome.

As a final limitation, we only examined full chain private investment deals. As documented elsewhere (e.g., Stevenson and Grabowski 2008), a small number of independent facilities were acquired by private investment firms. Given the small number of facilities involved in these transactions, however, any bias to excluding these facilities will be trivial. Moreover, because these independently acquired private investment facilities were included in the control group, any bias introduced by classifying these facilities in such a manner would run against finding an effect on private investment acquisition.

Private investment is now an important feature of today's nursing home sector. We did not find any negative impact of private investment on the financial health of acquired facilities. Nevertheless, this development raises important questions about oversight and transparency, whose answers extend beyond private investment-owned facilities.

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NOTE

1. Following the recent U.S. Government Accountability Office (GAO) (2010, 2011) reports, we use the more general term "private investment" (rather than "private equity") to refer to these transactions. Private equity refers to only a subset of the deals.

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SUPPORTING INFORMATION

Additional supporting information may be found in the online version of this article:

Appendix SA1: Author Matrix.

Figure S1: Distribution of Nursing Homes by Year.

Table S1: Unadjusted Trends for PEI-Acquired Nursing Homes before and after Transaction.

Table S2: Base Model (Table 3 in Article) with Inclusion of State Policy Measures.

Table S3: Base Model (Table 3 in Article) Using Propensity Score Matched Comparison Group.

Table S4: Base Model (Table 3 in Article) Including Occupancy Rate, Staffing Measure, and Payer Mix Measures as Regressors.