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Asymmetric Accounting Performances and Labor Adjustments in the U.S. for-Profit Skilled Nursing Facilities, 1998-2014

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ABSTRACT

Background: Studies have documented the positive relationship between skilled nursing facilities' staff level and patient outcomes or quality. However, less attention has been paid to supply-side frictions; for example, SNF's ability to retain employees during economic downturns.

Objective: We first validate whether SNFs' accounting performances present asymmetric patterns due to accountants' conservative judgments. Next, we examine whether SNFs exhibit asymmetric labor adjustments. If accounting performances are more negative during downturns than their positive counterparts during upturns, SNFs will face greater financial burdens to retain employees during adverse periods.

Methods: Our data is state-audited annual cost reports that SNFs submitted to the CMS from 1998 to 2014. We use county-level occupancy rate changes as the instrument for business fluctuations and run a piecewise linear regression to capture any asymmetry between positive and negative business fluctuations.

Results: We find that the commonly-used accounting profitability measure, return on assets (*ROA*), decreases more during economic downturns relative to the corresponding increases during upturns. When decomposing *ROA* into two components i.e. *accruals* that involve accountants and *cash flows* that do not involve accountants, we find asymmetric patterns in only *accruals* but not in *cash flows*, consistent with accountants' conservative judgments driving the asymmetry. When examining labor adjustments, we find that SNFs are reluctant to lay off employees during downturns relative to the speed of recruiting new employees during upturns. In a subsample, we find that higher-skilled nurses are retained while lower-skilled employees are laid off during adverse periods.

Conclusion: Our findings suggest that SNFs face greater financial hardships during economic downturns due to capital providers' reliance on accounting reporting. During those difficult times, SNFs adjust their labor forces by curtailing lower-skilled employees more than higher-skilled nurses. Our findings on SNFs' supply-side constraints complement the proposal of mandating SNFs' minimum staffing requirements.

Keywords: Skilled nursing facility; Conservative accounting; Business fluctuations; Labor adjustments; Asymmetric timeliness; Minimum staffing requirements; Cost curtailment; Cost stickiness; Financial constraints; For-profit entities

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ABBREVIATIONS

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(SNF) Skilled Nursing Facilities; (CMS) Centers for Medicare & Medicaid Services; (ROA) Return on Assets

INTRODUCTION

President Biden, in his State of the Union Address in October 2022, called for federal minimum staffing requirements for Skilled Nursing Facilities (SNF) because evidence suggests that understaffed SNFs have a significantly higher COVID-19 infection rate and SNFs with higher employee turnovers during the Great Recession of 2008 have a significantly lower quality of patient care [1,2]. Reflecting the aging U.S. population, SNFs serve about 1.3 million patients, with total spending approaching \$196 billion [3,4]. Unlike hospitals, 70% of which are non-profit entities, more than 55% of SNFs in the U.S. are for-profit entities, based on the Centers for Medicare & Medicaid Services (CMS) cost reports from 1998-2014 [5].

Existing studies have shown that for-profit entities across various industries rely on accounting performances to raise external capital, and capital providers continue using accounting performances to monitor their investments in these for-profit entities [6-8]. It is well-known in the accounting literature that accountants exercise conservative judgments. In particular, accountants tend to be conservative by reporting unfavorable business fluctuations earlier than favorable ones [9]. Therefore, SNFs' reported accounting performances are expected to be more negative during adverse periods compared to positive accounting performances during favorable periods. Such asymmetric accounting performance reports could constrain SNFs' ability to retain employees during downturns like COVID-19 or the Great Recession.

In this study, we propose an innovative approach to capture regional business fluctuations faced by individual SNFs to draw causal inferences on SNFs' reported asymmetric accounting performances. More importantly, we further examine whether SNF's labor adjustments present an asymmetry across positive and negative business fluctuations. We last discuss how our findings on SNF's supply-side frictions add to the existing literature and ongoing policy debate.

METHODOLOGY

Proposed Instrument for Business Fluctuations and Data

Existing evidence on whether firms' reported accounting performances or labor adjustments present asymmetry across business fluctuations is lacking mainly due to data availability and measurement issues. First, some firm-level instruments for business fundamentals are relevant but under the examined firms' control. Hence, the same firms' accounting reporting and operational responses simultaneously determine these firm-level instruments. Second, researchers are constrained by limited time-series data when using macroeconomic cycles to capture business fluctuations. We propose an innovative approach to capture regional business fundamentals specifically for skilled nursing facilities and avoid such problems.

In particular, we propose to use changes in the county-level occupancy rates (Δ Occupancy) as instruments for changes in the business fundamentals faced by SNFs operating in those counties. The county-level occupancy rate changes are remote from individual SNFs' operational and accounting choices while still capturing key fluctuations in their relevant business conditions. The 3,000+ counties in the U.S. provide sufficient variations to infer asymmetric patterns. Our data source is state-audited annual cost reports that SNFs submitted to the CMS from 1998 to 2014. Our sample comprises 11,350 for-profit skilled nursing facilities, representing 108,345 facility years. Our sample starts in 1998 because the Balanced Budget Act of 1997 significantly altered industry dynamics (The Balanced Budget Act of 1997 changed how Medicare pays skilled nursing facilities. Prior to the Act, Medicare reimbursed incurred costs. Afterwards, Medicare pays a fixed rate per inpatient day). We include only for-profit entities in our sample to hold constant ownership types because studies have shown managerial incentives vary across SNFs' ownership types [10].

Hypothesis Development

Our first hypothesis relies on the accounting theory, such that accountants tend to be conservative by reporting unfavorable business fluctuations earlier than favorable ones [9]. For example, accountants report loss events immediately but wait to report gain events until uncertainties are resolved [11]. Such asymmetric timeliness between gain and loss events leads to a greater correlation between accounting performances and adverse business fluctuations than the correlation between accounting performances and positive business fluctuations.

Our analysis starts with a commonly-used accounting profitability measure, return on assets (*ROA*), calculated as the annual net profit divided by the beginning-of-year total assets. *ROA* captures how much profits an SNF generates at the end of a year relative to the total asset invested (by external capital providers) at the beginning of the year. We expect that *ROA* becomes more negative during business downturns compared to increases in ROAs during upturns due to conservative accounting judgments.

To further verify that the underlying mechanism is due to accountants' judgment rather than other asymmetric arrivals of business events, we decompose an SNF's *ROA* into two components: Accrual earnings that are produced by accountants and operating *cash flows* that do not involve accountants. If the conservative accounting theory is correct, we expect accrual earnings to respond more negatively to adverse business fluctuations than increases in accrual earnings during positive counterparts, but operating *cash flows* present symmetric responses across business fluctuations [12].

Our second hypothesis examines firms' employee adjustments. Managerial accounting theories are split on how firms adjust their labor forces in response to business fluctuations. On the one hand, the cost curtailment argument postulates greater responses to adverse business fluctuations than positive counterparts due to the incurrence of employee severance payments related to layoffs [13]. On the other hand, the cost stickiness hypothesis argues that managers are more reluctant to reduce operating resources during economic downturns to avoid incurring current and future adjustment costs (e.g. to retrain skilled employees if business condition subsequently strengthens) than to increase resources during economic upturns, leading to a greater response to positive business fluctuations than to negative counterparts [14].

Skilled nursing facilities are labor intensive, employing higher-skilled registered and licensed practical nurses, lesser-skilled nurse assistants, and other personnel. We conjecture that cost curtailment likely applies to lesser-skilled employees, while cost stickiness applies to higher skilled employees. This is because higher-skilled nurse positions have higher adjustment costs, such as recruiting and training. We use the facility's proportion of total hours worked that is attributable to higher-skilled nurses as the proxy for labor adjustment costs.

Empirical Model

To test our first hypothesis, such that accrual earnings respond more to adverse business fluctuations than positive counterparts, but operating *cash flows* present symmetric responses, we augment the piecewise linear regression model of Basu (1997) with our proposed instrument Δ *Occupancy* as follows:

 ROA_i , $Accruals_i$, or cash $flow_i = \gamma_0 + \gamma_1 D \Delta Occupancy_j +$

 $\gamma_2 \Delta Occupancy_j + \gamma_3 (D \Delta Occupancy_j \times \Delta Occupancy_j) + \varepsilon_i...$ (1)

The subscripts i and j denote skilled nursing facilities and counties, respectively. *ROA* is net income from services to patients deflated by beginning-of-year total assets. *cash flow* is *ROA* minus *Accruals* (i.e., *ROA=Accruals+Cash flow*). *Accruals* are calculated based on the formula: *Accruals=*changes in current assets–changes in current liabilities–changes in the cash ending balance–depreciation and amortization expenses [12]. All accounting information comes from cost report worksheet G.

The explanatory variables include three sets of variables:

- A dichotomous variable for negative annual occupancy rate changes (D Δ Occupancy),
- A continuous variable of annual *occupancy* rate changes (Δ *Occupancy*), and
- The product of the corresponding values of (1) and (2).

 Δ Occupancy is the annual growth rate in the room occupancy rate for the county where the facility is located. The occupancy rate is calculated as the sum of occupied rooms divided by the available rooms (cost report worksheets S-2 and S-3). Although we examine accounting reporting and labor adjustments for only for-profit SNFs, we include all SNFs across different ownership types in the county to construct the occupancy rate because such occupancy rates are closest to the business fluctuations monitored by SNFs.

We conduct Fama-MacBeth (1973) cross-sectional regressions annually and report the average value across annual coefficients or R-squared estimates. The Fama-MacBeth procedure allows us to remove macroeconomic fluctuations and focus on county-level business fluctuations [15]. The 11,000+ for profit skilled nursing facilities across 3,000+ counties provide sufficient variations to examine the asymmetric accounting reporting and labor adjustment responses during the 17 years from 1998 to 2014. Accounting conservative judgment is present in accrual earnings but not in operating *cash flows*. Hence, we expect γ 3 to be significantly positive when *ROA* or *Accruals* is the dependent variable, but we expect γ 3 to be insignificantly different from zero when *cash flow* is the dependent variable.

To test our second hypothesis of whether skilled nursing facilities present asymmetric labor adjustments, we replace the dependent variable in equation (1) with the percentage growth in the number of employees (Δ *Employee*). Next, we examine labor adjustment costs in the following regression model:

 Δ Employee_i =

$$\begin{split} \rho_{o} + \rho_{1} D \Delta Occupancy_{j} + \rho_{2} \Delta Occupancy_{j} \\ + \rho_{3} (D \Delta Occupancy_{j} \times \Delta Occupancy_{j}) + \delta_{o} Skill_{i} + \delta_{i} (Skill_{i} \times D \Delta Occupancy_{j}) + \delta_{2} (Skill_{i} \times \Delta Occupancy_{j}) + \delta_{3} (Skill_{i} \times D \Delta Occupancy_{j} \times \Delta Occupancy_{j}) + \varepsilon_{i} ... (2) \end{split}$$

The subscripts i and j denote skilled nursing facilities and counties, respectively. Δ *Employee* is the annual growth rate in the number of employees (cost report worksheet S-3). Skill is the facility's proportion of total hours worked that is attributable to higher-skilled nurses (cost report worksheet S-3 Part V). Higher-skilled nurses include registered nurses (Bachelor's degree) and licensed practical nurses (a one or two year's program). According to the Bureau of Labor Statistics, the median hourly wage is \$ 31.6 for registered nurses, \$ 24.1 for licensed practical nurses, and \$ 13.4 for certified nursing assistants, and \$ 14.2 for non-nurse employees, consistent with differential skill levels.

RESULTS

Table 1 reports the number of observations, mean, quartiles, and standard deviation for each model variable. $\Delta Occupancy$ is the annual growth rate in the room occupancy rate for the

county in which the facility is located (CMS cost report), where the occupancy rate is the sum of occupied rooms divided by the sum of available rooms, based on all facilities across different ownership types in the county (Cost report worksheets S-2 and S-3). ROA is net income from services to patients deflated by beginning-of-year total assets (cost report worksheet G). Cash flow is ROA minus Accruals (i.e., ROA=Accruals+Cash flow). Accruals=changes in current assets-changes in current liabilitieschanges in the cash ending balance-depreciation and amortization expenses (cost report worksheet G). ΔEmployee is the annual growth rate in the number of employees (Cost report worksheet S-3). Skill is the facility's proportion of total hours worked that are attributable to higher-skilled nurses (Cost report worksheet S-3 Part V). Higher-skilled nurses include registered nurses (Bachelor's degree) and licensed practical nurses (a one- or two-year program). The sample includes 108,345 for-profit skilled nursing facilities-years from 1998-2014 for 11,350 distinct facilities. Skill is available only for 19,623 observations beginning in 2010, following the imposition of additional disclosure requirements in the CMS cost report. We require all variables to be not missing and all deflators to take positive values. All variables are winsorized at their 1% and 99% tails to

Table 2: Correlation Matrix.

avoid input errors.

Table 1: Variable Distributions.

	N	Mean	25 th	50 th	75 th	Std.
	N	Weall				dev.
Δ Occupancy	108,345	0.00	-0.02	0.00	0.02	0.05
ROA	108,345	0.02	-0.09	0.04	0.20	0.50
Accruals	108,345	-0.04	-0.15	0.05	0.26	0.87
Cash flow	108,345	0.06	-0.24	0.01	0.27	0.92
Δ Employee	108,345	0.23	-0.04	0.00	0.09	1.14
Skill	19,623	0.22	0.19	0.22	0.25	0.05

The mean of $\Delta Occupancy$ is 0%, with a standard deviation of 5%. The mean of $\Delta Employee$ is 23%, with a standard deviation of 114%. The mean of Skill is 22%, with a standard deviation of 5%. These standard deviations indicate sufficient variation, suggesting our tests should be reasonably powerful.

Table 2 reports the Pearson (upper right triangle) and Spearman (lower left triangle) correlations of the variables for the skilled nursing facility sample. *, **, and *** denote significance at the 10%, 5%, and 1%, respectively, levels in two-tailed tests.

	Δ Occupancy	ROA	Accruals	Cash flow	Δ Employee	Skill
Δ Occupancy		0.02	0.00	0.01	0.12	(0.01)
		***		***	***	**
ROA	0.04		0.26	0.28	(0.01)	(0.04)
	***		***	***	***	***
Accruals	0.01	0.26		(0.81)	(0.01)	0.02
	***	***		***	***	***
Cash flow	0.02	0.34	(0.71)		0.00	(0.04)
	***	***	***			***
Δ Employee	0.13	0.06	0.03	0.02		(0.05)
	***	***	***	***		***
Skill	(0.02)	(0.05)	0.04	(0.07)	(0.03)	
	**	***	***	***	***	

As expected, $\Delta Occupancy$ positively correlates with *ROA*, *Accruals* (Spearman only), *cash flow*, and $\Delta Employee$. Skill negatively correlates with $\Delta Occupancy$ and $\Delta Employee$, consistent with expanding (contracting) markets disproportionately hiring (firing) less-skilled employees.

Table 3 reports the time-series means and corresponding significance levels based on Fama-MacBeth (1973) standard errors of the estimated coefficients in annual OLS cross-sectional estimations of the equation (1) regression model. *, **, and *** denote significance at the 10%, 5%, and 1%, respectively, levels in two-tailed tests. Table 3: Conservative Accounting Judgment in Skilled Nursing Facilities.

Dependent Variable:	BOA	Aceruale	Cash
Dependent variable.	KUA	Acciuais	Flow
Intercept	0.04 ***	-0.01	0.06 ***
D Δ Occupancy	-0.02 ***	-0.01	-0.01
Δ Occupancy	-0.19	-0.67 ***	0.35 **
$D \triangle Occupancy \times \triangle Oc-$	0.92 ***	1.52 ***	-0.35
N	108,345	108,345	108,345
Adj. R ²	0.003	0.001	0.0003

The first column of **Table 3** reports the OLS estimation of equation (1) with the dependent variable *ROA*. The coefficient $\gamma 2$ on $\Delta Occupancy$ is insignificant, but the coefficient $\gamma 3$ on $D\Delta Occupancy \times \Delta Occupancy$ is significantly positive, consistent with scaled earnings reflecting conservative accounting judgment.

The second and third columns of Table 3 report the OLS estimation of equation (1) with the dependent variables Accruals and cash flow. For the Accruals model in the second column, the coefficient γ^2 on $\Delta Occupancy$ is significantly negative, perhaps because higher occupancy increases the usage of inventories or the accrual of payables for labor and other inputs. The coefficient γ 3 on *D* Δ *Occupancy* × Δ *Occupancy* is significantly positive, consistent with accrual earnings reflecting conservative accounting judgment. In contrast, for the cash flow model in the third column, the coefficient $\gamma 2$ on $\Delta Occupancy$ is significantly positive, and the coefficient y3 on $D\Delta Occupancy \times$ ΔOccupancy is insignificant, suggesting symmetric responses across business fluctuations. Results in Table 3 are consistent with conservative accounting judgment being present in only accrual earnings but not in non-accountant-involved operating cash flows.

Table 4 reports the OLS estimation of equation (2) with the dependent variable $\Delta Employee$ and the interactions of Skill with $\Delta Occupancy$ excluded in column (1) and included in column (2). The sample in column (1) includes all 108,345 observations with non-missing $\Delta Employee$, while the sample in column (2) includes 19,623 observations with non-missing $\Delta Employee$ and Skill. *, **, and *** denote significance at the 10%, 5%, and 1%, respectively, levels in two-tailed tests.

 Table 4: Changes in Employees and Labor Adjustment Costs in Skilled

 Nursing Facilities.

Model:	(1)	(2)
Intercept	-0.01	0.14
D Δ Occupancy	0.04***	-0.05
Δ Occupancy	4.63***	-0.96**
D Δ Occupancy × Δ Occupancy	-5.04***	1.69*
Skill		-0.41*
Skill × D \triangle Occupancy		0.15*
Skill × △Occupancy		5.42**
Skill × D \triangle Occupancy × \triangle Occupancy		-7.09*
Ν	108,345	19,623
Adj. R²	0.021	0.011

In the model that excludes the interactions of Skill with ΔOc cupancy reported in column (1), the coefficient on $D\Delta Occu$ pancy × $\Delta Occupancy$, is significantly negative, suggesting that the rate of layoffs during downturns is lower than the rate of recruiting during upturns. This evidence is consistent with the cost stickiness hypothesis that skilled nursing facilities are, on average, reluctant to curtail their employees during economic downturns.

In the model that includes the interactions of Skill with $\Delta Occu$ pancy reported in column (2), the coefficient on $D\Delta Occupancy \times \Delta Occupancy$ becomes slightly positive, and the coefficient on Skill $\times D\Delta Occupancy \times \Delta Occupancy$ is significantly negative. This additional finding reconciles the cost stickiness and the cost curtailment arguments. Since higher-skilled nurses have higher future adjustment costs (e.g., recruiting and training), skilled nursing facilities tend to retain higher-skilled nurses and lay off lesser-skilled employees during adverse business fluctuations.

DISCUSSION AND CONCLUSION

Overall, we find that SNFs' accounting performances decline more rapidly during economic downturns than the corresponding increases during economic upturns due to conservative accounting judgment. In contrast, SNFs are reluctant to lay off employees during adverse periods, possibly due to state-level minimum staffing requirements. When SNFs have to curtail employees during challenging times, lower-skilled employees are more likely to be laid off than higher-skilled employees, consistent with higher future adjustment costs for higher-skilled labor [16,17].

Our evidence on SNFs' supply-side frictions across business fluctuations complements existing studies focusing on SNFs' staff level and (demand-side) patient outcomes or quality. For example, Lin (2014) exploits state-level legislation changes in minimum staffing requirements to present a causal relationship between higher-skilled employees and the quality of patient care but insignificant associations for lower-skilled employees. Lin's evidence is consistent with our finding of SNFs retaining high-skilled nurses and laying off lesser-skilled employees during adverse business fluctuations.

Our study provides causal evidence of financial frictions faced by SNFs during economic downturns and identifies sources of these frictions as conservative accounting judgment and labor adjustment costs. In particular, we find that SNFs face three different sources of difficulties during economic downtowns:

- 1. A decrease in revenue due to lower demand, reflected in the declined occupancy rate,
- 2. A persistent level of (higher-skilled) employee costs due to expected higher future labor adjustment costs and state-level minimum staffing requirements, and
- 3. A potentially lower level of capital provided by external investors due to much more negative accounting performances related to conservative accounting reporting.

These results suggest that imposing minimum staffing requirements needs to consider the difficulties that SNFs face during economic hardship. Our results facilitate the debate over the federal-level minimum staffing requirements that are often based on demand-side evidence.

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CONFLICT OF INTEREST

The authors declare no conflicts of interest.

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