



Analyzing U.S. Private Equity's Acquisition of Nursing Facilities: Financial Modeling in Healthcare

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Abstract

In order to comprehend the U.S. Private equity's influence on nursing facilities, financial modeling is a good metric to assess facilities' financial health and fundamentals. To achieve this, I utilize Discounted Cash Flow Models (DCF) and Leveraged Buyout Models (LBO), along with various financial valuation models. The financial fundamentals, market trends, and market sentiments of companies can indicate their operational and financial sustainability. The objective of this project is to gain insights into how different valuation models and methods can forecast a company's financial health before and after the private equity (PE) acquisition. The outcomes of this project demonstrate a correlation between financial modeling and fundamental analysis in analyzing skilled nursing facilities and their relationship with Private Equity sponsors. These results were obtained through the implementation of financial valuation models to make predictions. The financial data parameters were analyzed using a genetic financial modeling method, considering factors such as revenue, expenses, net operating income, earnings before interest, taxes, depreciation, and amortization (EBITDA), enterprise value, etc. Results were obtained after an extensive optimization and analysis process, involving approximately 200,000 data points, conducted over a duration of 200 hours.

Keywords

Skilled Nursing Facilities, Financial Modelings, Inceom Statements, Revenue, Discounted Cash Flow, Leveraged Buyout, Private Equity

1. Research background

A quote from the Nobel prize-winning Quantum physicist Niels Bohr states: "It is difficult to make predictions, especially about the future." This quote serves as a warning of the importance of testing the forecasting models. It's quite easy to build a model that fits past data well. However, it's much more difficult to find a model to accurately identify the past data's features and then replicate them in the future given factors like "noise." Yes, it is difficult for those institutional investors as well. Yet, this journal is to help us explore ways to make viable predictions in a specific area within one of the most critical components of today's world—financial market.

The financial market consists of two primary markets: the public market and the private market. The company market is usually referred to as a public market, a marketplace where corporate shares can be bought and sold, and it is an essential component of a market economy. The public market helps publicly listed companies raise capital,

while the private market enables privately owned companies to raise capital by allowing institutional investors such as Private Equity Sponsors to buy equity in the company. Though private companies are not as volatile as publicly traded companies, their profitability and valuation are still very difficult to validate. In order to access companies more accurately, Private Equity Sponsors have developed models to minimize risks and increase the accuracy of profiting from investments.

It is a method that helps Private Equity Sponsors determine the intrinsic value of a company, allowing them to calculate company's valuations. Two main types of company valuation methods exist: absolute and relative. Absolute valuation, also known as intrinsic valuation, is based on a company's fundamental information and involves analyzing various financial metrics in the company's financial statements. Common absolute valuation methods include DCF and DDM. This research will primarily use the DCF analysis for company valuation. Relative valuation, on the other hand, compares the target company to similar companies using multiples. Examples of comparative valuation methods include precedent transaction analysis and comparable company analysis. In this research, precedent transactions and comparable analyses will be further analyzed for selected companies.

2. Financial model and hypothesis

2.1 Literature review

Valuation modeling is a widely used mathematical method in various fields such as finance, business, engineering, and social science. In finance, researchers have investigated the impact of multi-source, heterogeneous data and different mathematical models on company markets. Multi-source data in the company market can come from other sources, including the company market, foreign exchange market, company prices, trading volume, public comps, precedent transactions, company news, company financials, and social networks. According to the efficient market hypothesis (EMH), information from various sources can impact the company's market. At the same time, behavioral finance suggests that financial markets can be predicted and explained by analyzing the individual behaviors of traders and the public. These studies indicate that the internal mechanism of the company market is very complex, similar to Brownian motion (Guo, 2021).

The discounted cash flow (DCF) analysis is a widely used valuation methodology in different fields, such as institutional investment, property valuation, and business valuation. This methodology is constructive in mergers, joint ventures, and acquisitions. Using the DCF analysis, analysts acknowledge that a common company represents ownership in a business, and the company's value should reflect the returns investors expect to receive from owning it. John Burr Williams proposed in his theory of investment value in 1938 that the value of a company's company is the proportion of the cash flows generated by the business to which shareholders have a right. This means that the value of a company is determined by discounting the expected cash flows at the shareholders' required rate of return. In other words, the shareholders' expectation of the returns they will receive from holding the company is a crucial determinant of its value. This can also be expressed in the below formula.

$$V_0 = \sum_{t=1}^n \frac{CF_t}{(1+k)^t}$$

V_0 : the value of the company in period $t = 0$ CF_t : the cash flow generates at period t
 K : the discount rate N : the number of years

2.2 Progress of skilled nursing facilities and PE sponsorships

In March 2022, President Biden announced a nursing home reform plan, stating that "private equity firms are buying up struggling nursing homes" as evidence for the administrative actions. At the same time, AHCA/NCAI stated that all long-term care facilities need support from policymakers to address governmental underfunding so the SNFs can make continuous care improvements for the American elderly. A myth vs. facts conception is that Private Equity firms own a large and growing portion of nursing homes. Whereas, in reality, only 4.7% of all nursing homes are owned by private equity firms, leaving a great blank spot for PE firms to sponsor.

At this point, many nursing homes are on their financial brink, as chronic underfunding of Medicaid and unfunded government mandates. This is also observed in some PE-sponsored nursing homes, as government funding for

Medicaid and Medicare is quite stringent and many nursing facilities are struggling to fill that occupancy benchmark where they can break even. The lack of financial support for the industry has forced a number of nursing home providers to sell off their assets and seek other revenue sources and capital sponsors to keep operation. With the help of Private Equity firms, the nursing facilities' management team will be able to implement a series of operation improvements, such as cutting costs, increase cash flow, use debt to fund expansion, etc. With the right funding the operation strategies, private equity backed nursing facilities are able to turn-around from bankruptcy and continue their operations, serving the American elderly.

3. Industry research and background

3.1 U.S. behavioral health market

The U.S. behavioral health market is characterized by a diverse range of companies offering services for substance abuse and eating disorders. However, there is a concerning trend of diminishing numbers of qualified providers, particularly psychiatrists specializing in addiction treatment. This growing disparity between supply and demand suggests significant potential for market expansion, with an urgent need for innovative solutions to address the short-fall in specialized healthcare professionals.

Reports underscore the scarcity of mental health professionals across the United States, with only an average of 30 psychologists and 15.6 psychiatrists per 100,000 individuals. This shortage is particularly acute in rural areas, where limitations in funding and infrastructure exacerbate the challenges of accessing mental healthcare services. The geographical imbalance in provider distribution further underscores the pressing need for targeted interventions to bridge this gap and ensure equitable access to mental health support nationwide.

In recent years, there has been a noticeable uptick in visits related to various mental health conditions, signaling a growing demand for behavioral health services. Notably, eating disorders saw a significant surge of 52.6%, followed by anxiety (47.9%), alcohol and substance use disorders (27.4%), depression (24.4%), and bipolar disorder (12.2%). This surge in demand underscores the importance of robust healthcare infrastructure and effective intervention strategies to meet the evolving needs of individuals grappling with mental health challenges.

3.2 U.S. behavioral health market size:

The U.S. Behavioral Health Market exhibited robust growth, reaching a valuation of USD 79.99 billion in 2022. Projections indicate further expansion, with market value expected to climb from USD 83.70 billion in 2023 to USD 115.21 billion by 2030, reflecting a Compound Annual Growth Rate (CAGR) of 4.7%. This growth trajectory underscores the increasing recognition of mental health issues and the rising demand for comprehensive behavioral health services nationwide. Health issues such as mental illness, anxiety, depression, substance use disorders, and eating disorders contribute significantly to distress and disability in the United States. According to a research report from Mental Health America, nearly 50 million Americans, representing 19.86% of adults, reported experiencing mental illness. Furthermore, approximately 25.2% of Americans are projected to require behavioral health services, indicating a 1.2% increase from 2021. These statistics underscore the urgent need for robust healthcare infrastructure and comprehensive support systems to address the growing prevalence of mental health challenges across the nation.

Substance use disorders remain a prevalent issue in the United States, with an estimated 61.2 million individuals (21.9% of the population aged 12 or above) reported to have used illicit drugs. According to the National Survey on Drug Use and Health (NSDUH) 2021 report, approximately 46.3 million individuals meet the criteria for substance use disorder, including 24 million with drug use disorder and 29.5 million with alcohol use disorder. These findings highlight the multifaceted nature of behavioral health issues and underscore the need for targeted interventions to address substance abuse and addiction effectively.

Financial constraints pose significant barriers to accessing behavioral health services for many individuals in the United States. Patients suffering from major depression, for example, incur substantial costs, spending an average of USD 10,836 per year on treatment. These financial burdens further exacerbate disparities in healthcare access and underscore the need for comprehensive healthcare reform to ensure equitable access to mental health support and

treatment options for all individuals.

3.3 Competitive landscape

In the competitive landscape of the U.S. behavioral health sector, Arcadia Health reported a noteworthy 10% growth in its behavioral health sector in 2021. Acadia Healthcare emerges as a prominent player, with operations spanning 227 facilities across 40 states. Other key market players such as BHG Holdings, American Addiction Centers, and Uprise Health are expanding their presence by introducing new services and facilities to cater to the growing demand for behavioral health services in the United States. Universal Health Services holds a significant market share, boasting a widespread presence across states with multiple facilities. These industry players play a pivotal role in shaping the landscape of the U.S. behavioral health market, driving innovation, and expanding access to comprehensive mental health services nationwide.

4. Research methodology

4.1 Data collection

In this research paper, I will be analyzing company value (price prediction) from the financial valuation aspect. This journal analyzes quantifiable data such as company financial fillings and company price data. Data in this research are all numeric data in the format of Excel. They are extracted from Yahoo Finance. There are 8 data sets of company price data from the year 2020 to 2022, and I also included 10 comparable companies' financial data. These data describe the financial performance of a publicly listed behavioral health company, the pennant group, a skilled nursing facility, and a behavioral health company in Tenses.

4.2 Executive summary

Pennant Group. Inc (NASDAQ: PNTG) is a leading provider of high-quality healthcare services to patients or residents of all ages, including the growing senior population, in the United States. It operates on multiple lines of business, including home health, hospice, and senior living across the states of the U.S. The company provides home health and hospice services through 95 agencies, deriving revenue from a diversified blend of payors, including Medicare and Medicaid programs, private pay patients and residents, and managed care payors. The company in Q1 2023 was able to hit strong revenue growth of 11% YoY to 126.5 million. Additionally, management recently acquired Bluebird Home Health, Hospice, and Home Care, providing health services across Southwestern Idaho.

4.3 Financial modeling

In the valuation model, the assumptions (revenue growth, cost of sales, operating expenses, depreciation and amortization, capital expenditure, and tax rate) are all based on the Wall Street assumptions. This model is to help us better understand the evolution of Pennant's valuation from a financial modeling perspective. Meanwhile, in Pennant's case study, I will use the data from 2017-2019 to calculate the company valuation range in 2020-2021 and then compare it with Pennant's 2020-2021 company price to examine the viability of DCF and Comparable company valuation.

In this DCF analysis, I used Pennant as the sample company to predict its company performance in the 2023-2032 year by using Pennant's financial data from 2020, 2021, and 2023. In this analysis, I will apply Discounted Cash Flow analysis, Comparable Company analysis, and Public Comps to calculate Pennant's enterprise value. Then, I applied the Leveraged Buyout model to analyze its buyout profitability for Private Equity firms. In this analysis, I gathered all of Pennant's financial statements and related information from the SEC website, equity research reports, Capital IQ, Bloomberg, and Romero's mentoring website. Before starting DCF valuation, I extracted Pennant's 2020-2022 financial statements (income statements, balance sheet, cash flow statement) from Pennant's 10K and 10Q. Then, I cleaned the data and put them into three sheets to forecast the 2023- 2032 financial statements based on the assumptions from Walls Street research reports.

5. Analysis of results

5.1 Results output

Income Statement:

\$ in thousand, except per share

	Historical			Projected									
	2020A	2021A	2022A	2023P	2024P	2025P	2026P	2027P	2028P	2029P	2030P	2031P	2032P
Revenue	\$390,953.0	\$439,694.0	\$473,241.0	\$546,930.5	\$634,519.5	\$738,754.5	\$859,972.6	\$999,921.4	\$1,160,911.1	\$1,345,392.1	\$1,555,932.7	\$1,795,189.1	\$2,065,869.0
Cost of services	296,874.0	350,236.0	376,638.0	428,752.3	502,611.1	584,085.6	678,424.7	790,484.4	917,148.1	1,062,618.6	1,229,390.0	1,418,184.9	1,631,997.4
Rent	39,191.0	40,863.0	38,018.0	49,864.6	55,931.3	63,940.3	76,213.8	87,767.3	101,753.6	118,415.8	136,631.5	157,664.8	181,559.1
Gross profit	\$54,888.0	\$48,595.0	\$58,585.0	\$68,313.6	\$75,977.1	\$90,728.5	\$105,334.0	\$121,669.7	\$142,009.4	\$164,357.8	\$189,911.2	\$219,339.5	\$252,312.5
General and administrative expense	\$31,296.0	\$36,259.0	\$33,981.0	\$42,718.84	\$49,148.94	\$55,990.17	\$66,319.65	\$76,782.90	\$88,886.02	\$103,358.86	\$119,381.02	\$137,700.83	\$158,559.68
Depreciation and amortization	4,675.0	4,784.0	4,900.0	1,531.4	3,146.5	4,870.3	6,722.6	8,722.4	9,358.0	11,039.8	11,255.1	11,526.0	13,700.6
Loss on asset dispositions and impairment, net	0.0	2,857.0	6,965.0	3,867.8	5,982.9	7,687.6	7,713.1	9,600.6	11,213.1	12,659.8	14,869.5	17,129.3	19,631.4
Operating Income (EBIT)	\$18,917.0	\$4,695.0	\$12,739.0	\$20,195.6	\$17,698.7	\$22,180.4	\$24,578.7	\$26,563.8	\$32,552.3	\$37,299.3	\$44,405.5	\$52,983.4	\$60,420.8
(+) Other (expense) income	\$225.0	(\$24.0)	(\$31.0)	\$345.1	\$808.2	\$986.6	\$798.9	\$794.0	\$705.5	\$620.4	\$325.3	\$161.0	\$273.4
(+) Interest expense, net	(1,239.0)	(1,941.0)	(3,816.0)	(\$13,031.6)	(\$13,720.3)	(\$14,008.6)	(\$14,083.8)	(\$14,166.1)	(\$14,044.5)	(\$13,199.3)	(\$11,689.7)	(\$10,523.6)	(\$10,132.9)
(+) Other expense, net	(1,014.0)	(1,965.0)	(3,847.0)	(\$12,686.5)	(\$12,912.1)	(\$13,022.0)	(\$13,284.9)	(\$13,372.3)	(\$13,339.0)	(\$12,778.9)	(\$11,364.4)	(\$10,362.6)	(\$9,859.5)
Income Before Taxes	\$17,903.0	\$2,730.0	\$8,892.0	\$7,509.0	\$4,786.6	\$9,158.4	\$11,293.8	\$13,191.7	\$19,213.2	\$24,720.4	\$33,041.1	\$42,620.8	\$50,561.3
(-) Provision for income taxes	2,350.0	582.0	1,649.0	3,567.2	3,393.8	4,094.8	4,530.7	4,964.8	6,031.3	6,919.2	8,254.8	9,831.6	11,217.4
Net income	\$15,553.0	\$2,148.0	\$7,243.0	\$3,941.9	\$1,392.8	\$5,063.7	\$6,763.1	\$8,226.9	\$13,181.9	\$17,801.2	\$24,786.3	\$32,789.1	\$39,343.9
(-) Net income (loss) attributable to NCI	(191.0)	(548.0)	600.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Net income and other comprehensive income attributable	\$15,744.0	\$2,696.0	\$6,643.0	\$3,941.9	\$1,392.8	\$5,063.7	\$6,763.1	\$8,226.9	\$13,181.9	\$17,801.2	\$24,786.3	\$32,789.1	\$39,343.9
Earnings per share:													
Basic	\$0.56	\$0.09	\$0.23	\$0.14	\$0.05	\$0.17	\$0.23	\$0.28	\$0.45	\$0.61	\$0.86	\$1.13	\$1.36
Diluted	\$0.52	\$0.09	\$0.22	\$0.13	\$0.05	\$0.17	\$0.22	\$0.27	\$0.44	\$0.59	\$0.82	\$1.09	\$1.31
Weighted average common shares outstanding:													
Basic	28029	28406	29064	28976	28976	28976	28976	28976	28976	28976	28976	28976	28976
Diluted	30228	30642	30159	30071	30071	30071	30071	30071	30071	30071	30071	30071	30071
Revenue Growth		12.5%	7.6%	15.6%	16.0%	16.4%	16.4%	16.3%	16.1%	15.9%	15.6%	15.4%	15.1%
D&A	\$4,675.0	\$4,784.0	\$4,900.0	\$1,531.41	\$3,146.55	\$4,870.31	\$6,722.56	\$8,722.40	\$9,358.03	\$11,039.77	\$11,255.14	\$11,526.03	\$13,700.63
EBIT	\$18,917.0	\$4,695.0	\$12,739.0	\$20,195.6	\$17,698.7	\$22,180.4	\$24,578.7	\$26,563.8	\$32,552.3	\$37,299.3	\$44,405.5	\$52,983.4	\$60,420.8
EBITDA	\$23,592.0	\$9,479.0	\$17,639.0	\$21,727.0	\$20,845.3	\$27,050.7	\$31,301.3	\$35,286.1	\$41,910.3	\$48,339.1	\$55,660.6	\$64,509.4	\$74,121.4

\$ in thousand, except per share

	Historical	Projected										
	2022A	2023P	2024P	2025P	2026P	2027P	2028P	2029P	2030P	2031P	2032P	
Top-Down Unlevered Free Cash Flow (UFCF) Calculations												
EBITDA	\$17,639.0	\$21,727.0	\$20,845.3	\$27,050.7	\$31,301.3	\$35,286.1	\$41,910.3	\$48,339.1	\$55,660.6	\$64,509.4	\$74,121.4	
(-) D&A	\$4,900.0	\$1,531.4	\$3,146.5	\$4,870.3	\$6,722.6	\$8,722.4	\$9,358.0	\$11,039.8	\$11,255.1	\$11,526.0	\$13,700.6	
EBIT	\$12,739.0	\$20,195.6	\$17,698.7	\$22,180.4	\$24,578.7	\$26,563.8	\$32,552.3	\$37,299.3	\$44,405.5	\$52,983.4	\$60,420.8	
(-) Taxes	\$1,649.0	\$3,567.2	\$3,393.8	\$4,094.8	\$4,530.7	\$4,964.8	\$6,031.3	\$6,919.2	\$8,254.8	\$9,831.6	\$11,217.4	
NOPAT	\$11,090.0	\$16,628.4	\$14,304.9	\$18,085.7	\$20,048.1	\$21,599.0	\$26,520.9	\$30,380.1	\$36,150.7	\$43,151.7	\$49,203.4	
(+) D&A	\$4,900.0	\$1,531.4	\$3,146.5	\$4,870.3	\$6,722.6	\$8,722.4	\$9,358.0	\$11,039.8	\$11,255.1	\$11,526.0	\$13,700.6	
(+) Working Capital Surplus / (Deficiency)	(\$9,090.0)	(\$5,072.7)	(\$3,194.2)	(\$4,452.2)	(\$5,194.1)	(\$5,715.0)	(\$6,777.1)	(\$7,740.1)	(\$8,760.0)	(\$10,024.4)	(\$11,319.2)	
(-) Capital Expenditures	\$7,657.0	\$8,883.3	\$10,342.6	\$12,039.6	\$13,998.9	\$16,252.8	\$13,453.9	\$15,559.3	\$17,951.9	\$20,658.7	\$0.0	
Unlevered Free Cash Flow	(\$757.0)	\$4,203.8	\$3,914.7	\$6,464.1	\$7,577.7	\$8,353.7	\$15,647.9	\$18,120.4	\$20,694.0	\$23,994.7	\$51,584.9	

Discounted Periods - Mid Year Convention	-0.5 -Years	0.5 -Years	1.5 -Years	2.5 -Years	3.5 -Years	4.5 -Years	5.5 -Years	6.5 -Years	7.5 -Years	8.5 -Years	9.5 -Years
Discounted Rate - WACC	9.7%										
Present Value of UFCF	\$4,013.7	\$3,407.1	\$5,128.5	\$5,480.4	\$5,507.4	\$9,404.2	\$9,927.2	\$10,334.6	\$10,923.4	\$21,407.2	
Sum of present value of UFCF	\$85,533.7										
NPV	\$81,664.6										

Weighted Average Cost of Capital (WACC)	
Stock Price	\$11.42
Fully Diluted Shares Outstanding	30159
Equity Value	\$344,415.78
Current Debt	\$316,215.0
Cash	\$2,079.0
Minority	\$0.0
Enterprise Value	\$662,709.78
Equity	\$344,415.78
Debt	\$316,215.0
Total Capitalization	\$660,630.78
CAPM	
30 year bond - risk free rate	3.9%
Equity risk premium	7.2%
Beta	2.04
Cost of Equity	10.6%
Tax Rate	17.7%
Costs of debt	5.60%
Cost of preferred stock	
WACC	7.7%
WACC	9.7%
Debt	
Total Capitalization	\$660,630.78

WACC	Sensitivity Analysis					
	Terminal EBITDA Multiple					
	10	11	12	13	14	
8.2%	\$4.04	\$5.21	\$6.37	\$7.53	\$8.69	
8.7%	\$3.55	\$4.66	\$5.77	\$6.88	\$8.00	
9.2%	\$3.07	\$4.14	\$5.20	\$6.27	\$7.33	
9.7%	\$2.62	\$3.64	\$4.66	\$5.68	\$6.70	
10.2%	\$2.19	\$3.16	\$4.14	\$5.12	\$6.10	
10.7%	\$1.78	\$2.71	\$3.65	\$4.58	\$5.52	
11.2%	\$1.38	\$2.28	\$3.18	\$4.07	\$4.97	
WACC	Sensitivity Analysis					
	Perpetuity Growth					
	4.0%	4.5%	5.0%	5.5%	6.0%	
8.2%	\$12.45	\$15.27	\$18.97	\$24.03	\$31.40	
8.7%	\$9.55	\$11.69	\$14.39	\$17.95	\$22.82	
9.2%	\$7.25	\$8.90	\$10.95	\$13.56	\$16.98	
9.7%	\$5.37	\$6.68	\$8.28	\$10.25	\$12.76	
10.2%	\$3.82	\$4.88	\$6.15	\$7.68	\$9.58	
10.7%	\$2.53	\$3.40	\$4.42	\$5.63	\$7.11	
11.2%	\$1.43	\$2.15	\$2.99	\$3.97	\$5.14	

- Assumed tax rate of 17.7%
- Cost of Debt is taken from the company's website for long-term debt
- Terminal EBITDA Multiple is taken from cornerstone OnDemand, being the most mature comparable and 10 years old from its IPO
- Assume 4.0% to 5.0% perpetuity growth rate due to the nature of the home-health industry

Market Trading Analysis of Selected Home-health, Hospice, and Senior Living Group

\$ in million, except per share

Company	Stock Price As of: 7/15/2023	Market Value of Equity	Enterprise Value	Enterprise Value / LTM			EPS	LTM Margins			Total debt / EBITDA	Debt / Equity Capitalization	Levered Beta
				Sales	EBITDA	PE		Gross	EBITDA	EBIT			
Home-health, Hospice, and Senior Living Group													
GeneDx (WGS)	\$6.72	172.0	45.4	0.2x	NM	23.2x	NM	NM	NM	NM	-0.2x	30.5% / 69.5%	1.9
Sharecare (SHCR)	\$1.74	621.9	469.8	1.0x	NM	NM	(0.33)	-25.2%	-16.4%	-27.4%	0.0x	0.4% / 99.6%	0.4
P3 Health Partners (PIII)	\$2.60	294.8	408.5	0.4x	NM	NM	NM	-24.9%	-14.4%	-22.5%	-0.8x	29.1% / 70.9%	1.3
Option Care Health Inc (OPCH)	\$32.51	5850.0	6700.0	1.7x	21.0x	NM	0.90	3.9%	7.9%	6.3%	3.6x	16.4% / 83.6%	1.3
Encompass Health Corp (EHC)	\$67.26	6742.0	9630.0	2.2x	10.6x	NM	2.80	6.1%	20.4%	14.8%	3.3x	30.6% / 69.4%	1.0
Atai Life Sciences N.V. (ATAI)	\$2.02	335.3	102.2	NM	NM	NM	(0.94)	0.0%	NM	NM	-0.1x	5.4% / 94.6%	0.7
Aveanna Healthcare Holdings Inc (AVAH)	\$1.56	289.9	1600.0	0.9x	NM	NM	(3.69)	-39.9%	4.1%	3.3%	NM	83.8% / 16.2%	1.2
Enhabit Inc (EHAB)	\$12.63	632.8	1210.0	0.0x	0.4x	2.3x	(1.28)	-6.0%	10.3%	7.2%	5.7x	49.5% / 50.5%	NM
Addus HomeCare Corporation (ADUS)	\$90.25	1462.0	1550.0	0.0x	0.5x	2.1x	3.19	5.2%	9.4%	8.0%	1.8x	10.0% / 90.0%	0.9
High				2.2x	21.0x	23.2x	3.19	6.1%	20.4%	14.8%	5.7x	98.2% / 78.6%	1.9
Low				0.0x	0.4x	2.1x	(3.69)	-39.9%	-16.4%	-27.4%	-0.8x	0.4% / 0.0%	0.4
Median				0.6x	5.6x	2.3x	(0.33)	-3.0%	7.9%	6.3%	0.9x	30.3% / 10.0%	1.1
Mean				0.8x	8.1x	9.2x	0.09	-10.1%	3.0%	-1.5%	1.7x	33.0% / 20.7%	1.1
The Pennant Group, Inc (Nasdaq: PNTG)	\$11.42	339.6	660.6	0.7x	38.8x	47.5x	(0.35)	1.5%	3.5%	4.8%	19.0x	48.8% / 51.2%	2.0

Figure 1. DCF Model.

IRR INVESTMENT SUMMARY

(in US\$ millions except shares & per share amounts)

Period Ending December 31	2022A	2023E	2024E	2025E	Estimates				
					2024E	2027E	2028E	2029E	2030E
Year to Exit	0.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0
EBITDA	\$24.6	\$37.7	\$45.7	\$51.8	\$72.9	\$81.6	\$91.3	\$120.5	\$133.8
Entry / Exit multiple	20.0x	20.0x	20.0x	20.0x	20.0x	20.0x	20.0x	20.0x	20.0x
Enterprise Value	\$491.5	\$754.3	\$914.8	\$1,035.7	\$1,457.7	\$1,632.2	\$1,825.9	\$2,409.7	\$2,475.7
Short term debt	\$96.2	\$94.3	\$86.3	\$74.5	\$46.9	\$14.0	\$0.0	\$0.0	\$0.0
Long-term debt	128.2	128.2	128.2	128.2	128.2	102.3	37.8	0.0	0.0
High yield debt	64.1	64.1	64.1	64.1	64.1	64.1	64.1	64.1	28.3
Mezzanine debt	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1
Operating lease liabilities	16.9	16.9	16.9	16.9	16.9	16.9	16.9	16.9	16.9
Long term operating lease liabilities	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0
Cash	(2.1)	(3.0)	(3.0)	(3.0)	(3.0)	(3.0)	(3.0)	(3.0)	(3.0)
Net Debt	\$885.4	\$582.6	\$574.6	\$562.8	\$535.2	\$502.3	\$462.4	\$397.9	\$324.3
Implied Equity Value	(\$93.9)	\$171.7	\$340.2	\$472.9	\$922.5	\$1,129.9	\$1,363.5	\$2,011.9	\$2,351.4
Initial investment	\$179.7								
IRR Calculation		-4.5%	37.6%	38.1%	50.5%	44.4%	40.2%	41.2%	37.9%
Multiple On Invested Capital (MOIC)		1.0x	1.9x	2.6x	5.1x	6.3x	7.6x	11.2x	13.1x

(in US \$ thousands)

Sources	Amount	%	Uses	Amount	%
Excess cash	\$1,779.0	0.2%	Purchase price (Equity value)	\$413,134.5	
Revolver	\$151,622.5	20.0%	Transaction fees	\$7,581.1	
Long term debt	\$75,811.2	10.0%	Refinanced debt	\$332,848.0	
High yield debt	\$75,811.2	10.0%	Debt financing fees		
Mezzanine debt	\$151,622.5	20.0%	Revolver	\$1,516.2	
Total debt	\$454,867.4	60.0%	Long term debt	\$758.1	
Equity investment:			High yield debt	\$758.1	
Financial sponsor	\$301,465.9	39.8%	Mezzanine debt	\$1,516.2	
Other	\$0.0	0.0%	Other	\$0.0	
Total sources	\$758,112.3	100.0%	Total uses	\$758,112.3	

Figure 2. LBO Analysis.

5.2 Valuation

Pennant Group is overvalued at \$606.6 million in enterprise value. Valuation analysis indicated an implied enterprise value of \$ xxx million and a range of \$218.9 to \$576.0 million. The company trades at higher than industry average multiples, with a 1.5% profit margin, and a 3.5% EBITDA margin. However, it is expected to expand its market and grow at a higher and more consistent rate than the rest of the industry.

In this LBO analysis, our assumptions are based on the above factors. The investor will acquire the Pennant Group at a 20% premium to its current enterprise value, a total buyback price of \$13.7 per share, implied EV/2023 EBITDA of 27.97x, debt interests are 3% for short-term debt, 4% for long-term debt fees, 6% for high-yield debt fees, and 9% for Mezzanine debt fees, 25% book to amortization, and 15 years of amortization period. With the above assumptions, we arrived at an internal rate of return (IRR) of 39% within the period of 5 years based on a 27.97x EV/EBITDA as an exit multiple. Thus, based on the above model, the buyout of the Pennant would be an accretive deal for its potential private equity investors.

6. Strengthen the study of financial modeling analyzing a company’s financial health

To summarize, Private Equity sponsors are able to inject more liquidity into distressed nursing facilities and bring them back to sound operating conditions. Through financial modeling, such as discounted cash flow and leverage buyout models, the private equity professionals will understand the target nursing facilities’ financial structure and come up with a viable deal structure for the acquisition. With the appropriate cash flow injections, distressed nursing facilities can continue to serve those in need.

It is important to note that this research provides a rough estimation of company prices, and future studies should consider more detailed metrics. Both the DCF and LBO models suffer from lagging problems, and market noise significantly impacts the accuracy of these financial models. In real life, many Private equity firms are smaller in size and thus would acquire and buy out nursing facilities within the middle market and lower middle market space. In

those scenarios, the financial sponsors usually Cap the rate and price per bed to value a nursing facility, as EBITDA multiple and DCF may be less applicable and accurate. Furthermore, our financial valuation models rely on rough assumptions from investment banks, and employing more detailed and accurate assumptions would improve the accuracy of predictions. These areas warrant further discussion and exploration in future research.

References

- (ISDA'05), Pretoria, South Africa, December 3-5, Piscataway: IEEE, pp. 192-96.
- “Electric Vehicle Market Size, Share, Analysis, Value, Report, 2030.” MarketsandMarkets, <https://www.marketsandmarkets.com/Market-Reports/electric-vehicle-market-209371461.html>.
- Ariyo, Adebisi A., et al. “Company Price Prediction Using the Arima Model.” 2014 UKSim-AMSS 16th International Conference on Computer Modelling and Simulation, 2014, <https://doi.org/10.1109/uksim.2014.67>.
- Avci, Emin. Forecasting daily and sessional returns of the ise-100 index with neural network models. *Dogus Universitesi Dergisi*, 2007, 8: 128-42.
- Chandola, Deeksha, et al. “Forecasting Directional Movement of Company Prices Using Deep Learning—Annals of Data Science.” SpringerLink, 1 Aug. 2022, <https://link.springer.com/article/10.1007/s40745-022-00432-6>.
- Choubey, Vijay. “How to Evaluate the Performance of a Machine Learning Model.” Medium, 4 Aug. 2020, <https://vijaychoubey.medium.com/how-to-evaluate-the-performance-of-a-machine-learning-model-d12ce920c365>.
- Dhaduk, Hardikkumar. “Company Market Forecasting Using Time Series Analysis with Arima Model.” Analytics Vidhya, 18 July 2021, <https://www.analyticsvidhya.com/blog/2021/07/company-market-forecasting-using-time-series-analysis-with-arima-model/>.
- Guo, Yixin. Company Price Prediction Using Machine Learning, 2022, <https://sh.diva-portal.org/smash/get/diva2:1672304/FULLTEXT01.pdf>.
- Hassan, Md Rafiul, and Baikunth Nath. Company market forecasting using hidden markov model: A new approach. Paper presented at the International Conference on Intelligent Systems Design and Applications. 2005.
- Hassan, Md Rafiul, Baikunth Nath, and Michael Kirley. A fusion model of hmm, ann and ga for company market forecasting. *Expert Systems with Applications*, 2007, 33: 71-80.
- Horstead, Andrew, and Serge Colle. “Six Essentials for Mainstream EV Adoption.” EY, 21 Mar. 2023, www.ey.com/en_us/energy-resources/six-essentials-for-mainstream-ev-adoption.
- <https://stateline.org/2024/01/31/private-equitys-growing-footprint-in-home-health-care-draws-scrutiny/>
- <https://www.ahcancal.org/News-and-Communications/Blog/Pages/Myths-vs--Facts-Private-Equity-and-Nursing-Homes.aspx>
- <https://zhuanlan.zhihu.com/p/270329722>
- https://zhuanlan.zhihu.com/p/290725183?utm_id=0
- International Journal of Theoretical and Applied Finance* 2: 221-41.
- Korean company price index (kosp). *Issues in Information System* 8: 372-8.
- Lee, Kyungjoo, Sehwan Yoo, and John Jongdae. Neural network model versus sarima model in forecasting. 2007.
- M, Padhma. “End-to-End Introduction to Evaluating Regression Models.” Analytics Vidhya, 28 Apr. 2023, <https://www.analyticsvidhya.com/blog/2021/10/evaluation-metric-for-regression-models/#:~:text=RMSE%20value%20with%20zero%20indicates,the%20model%20and%20its%20predictions.>
- Mondal, P., Shit, L., Goswami, S., 2014. Study of effectiveness of time series modeling (Arima) in forecasting company prices. *International Journal of Computer Science, Engineering and Applications*, 4, 13.
- White, Halbert. Economic prediction using neural networks: The case of ibm daily company returns. Paper presented at the IEEE 1988 International Conference on Neural Networks, San Diego, CA, USA, 1988, July 24-27, vol. 2, pp. 451-58.
- Yao, Jingtao, Chew Lim Tan, and Hean-Lee Poh. Neural networks for technical analysis: A study on klc.1999.