Evaluating the Development of a Continuing Care Retirement Community Based on the Example of the Taikang Insurance Group

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Abstract. The aging population poses significant challenges globally, altering age structures and straining societal resources. Continuing Care Retirement Communities (CCRCs) offer an innovative solution, yet their development in China remains nascent. The essay has combined an array of enterprise valuation methods to acquire a reliable estimated value for the company. The article introduces the Discounted Cash Flow (DCF) method and combines it with the Weighted Average Cost of Capital (WACC) and the Capital Asset Pricing Model (CAPM). Furthermore, the relative valuation model is also applied in the article in order to demonstrate a comprehensive valuation for the enterprise. When conducting the calculations, the article referred to the annual report of the Taikang Insurance Group and collected relative data. The article calculated a series of figures such as operating revenue, and free cash flow to evaluate the company. Results indicate that Taikang's valuation is underestimated, reflecting reduced market risk but limited public adoption due to high costs and novelty. The DCF analysis projects long-term growth potential, while relative valuation highlights discrepancies between intrinsic and market values. Challenges include scarce benchmarking data, forecasting limitations, and industry immaturity. The study underscores CCRCs' potential in addressing elderly care demands but emphasizes the need for government subsidies, standardized industry practices, and corporate strategies to enhance affordability and transparency. By bridging valuation insights with policy and operational recommendations, this research contributes to understanding CCRCs' viability in China's aging society.

Keywords: DCF, WACC, CAPM, Relative Valuation Model, CCRC

1 Introduction

The ageing population has been a serious problem across the world since the burst of population. According to the data publicized by the Civil Department of China, there are now 296.97 million people over 60, making up 21.1% of the population. (Fig. 1) Under such circumstances, the need for elderly care has increased dramatically, and providing such service to the elderly is a significant problem that remains to be solved.

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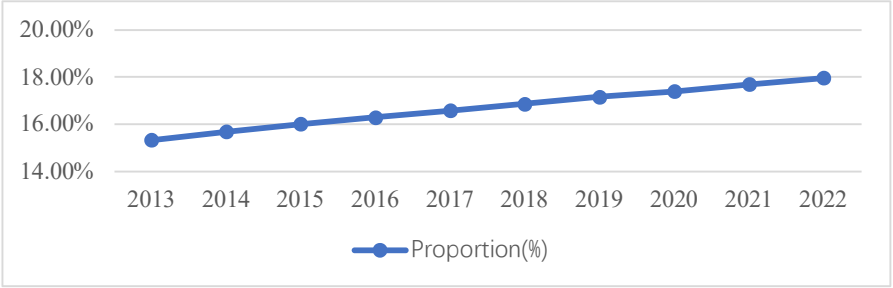

Fig. 1. The percentage of the general population that is elderly

Continuing Care Retirement Community, (hereafter CCRC) is a residential campus designed for the old. It provides an array of long-term care services encompassing nursing homes, assisted living facilities, and home-based services [1]. Moreover, senior adults may expect various social activities essential for relieving their loneliness and ensuring their welfare in later life [2]. CCRC's characteristic of comprehensiveness and social sustainability makes it a perfect option for solving the current problem [3].

The CCRC originates from the USA. It has already occurred even in the 1950s and has developed for decades, ending it with a mature management system and the perfect soil to develop. However, China has not introduced such elderly care communities until recent years, when the ageing trend has gradually become more serious. The development of CCRC currently remains in the starting phase with few representative enterprises, and it faces uncertainty on the long road ahead. Therefore, this essay will explore and evaluate the current situation of the CCRC industry based on a typical corporation named Taikang Insurance Group, thus providing insights into the development of the CCRC.

Several renowned and reliable methods in enterprise valuation exist, such as the Discounted Cash Flow (hereafter DCF) in the absolute valuation model and the Price/Earnings ratio (hereafter P/E) in the relative valuation model. Given the DCF model's intrinsic adaptability and apparent legitimacy, it is reliable and generally accepted to convey the analyst's findings [4]. Therefore, this article will use the DCF method and the P/E method to perform a detailed enterprise analysis, obtaining further insight into the industry.

By assessing the status quo, this article aims to illustrate the specifics of the CCRCs while testifying to the validity of such an elderly-care approach, which will eventually provide a basis for the public to choose among various elderly care methods. Furthermore, the essay seeks to find the potential drawbacks that lurk under the current CCRC model and provide possible suggestions for improvement that may help ameliorate the dilemma faced by families' social pressures of the ageing population. More possibly, the essay seeks to identify the potential drawbacks that lurk under the current CCRC model and provide possible suggestions for improvement, which may help ameliorate the dilemma families face and the tremendous pressure the ageing population places on society.

2 Method

There are generally two generally accepted models for evaluating an enterprise's value: the absolute valuation model and the relative valuation model.

2.1 The Absolute Valuation Model

The absolute valuation model consists of several sub-models, such as the DCF and Economic Value Added models (hereafter EVA). It aims to predict a company's intrinsic value by analyzing the financial statistics [5]. Among the sub-models, the DCF is the most frequently used one. It predicts the possible future cash flow of the corporation and discounts it back to the current time, thus calculating the value of the enterprise [6].

2.2 The DCF Model

In the DCF model, the sum of the future cash flow of a corporation should be computed first through the following equation (1).

$$V = \frac{CF_1}{1+r} + \frac{CF_2}{(1+r)^2} + \frac{CF_3}{(1+r)^3} + \cdots + \frac{CF_t}{(1+r)^t} = \sum_{t=1}^{n} \frac{CF_t}{(1+r)^t} \tag{1}$$

Where V refers to the value of the enterprise, CFt refers to the cash flow in year t, and r refers to the discount rate.

This equation only considers the future cash flow, while for an enterprise, its terminal value should not be neglected. Some investments offer a perpetuity, a profit that investors may gain. Therefore, such income should also be taken into consideration through the following equation (2).

$$Terminal\ Value = \frac{CF_t}{(1+r)^t} \times \frac{(1+g)}{(1+r)} + \frac{CF_t}{(1+r)^t} \times \frac{(1+g)^2}{(1+r)^2} + \cdots + \frac{CF_t}{(1+r)^t} \times \frac{(1+g)^n}{(1+r)^n} \tag{2}$$

Where g refers to the perpetual growth rate.

Through observation, it can be easily figured out that the equation is illustrated as a geometric progression.

In the geometric sequence, the first term a0 is represented as follows in Equation (3).

$$a_0 = \frac{CF_t}{(1+r)^t} \times \frac{(1+g)}{(1+r)} \tag{3}$$

The common ratio q is represented as follows in Equation (4).

$$q = \frac{(1+g)}{(1+r)} \tag{4}$$

Therefore, the terminal value can be calculated through the sum formula of a geometric sequence. (Equation (5))

$$S_n = \frac{a_0(1-q^n)}{1-q} \tag{5}$$

The eventual equation regarding the terminal value is calculated in Equation (6).

$$Terminal\ Value = \& \frac{a_0}{1-q} = \frac{CF_t}{(1+r)^t} \times \frac{(1+g)}{(1+r)} \times \frac{1}{1-\left(\frac{1+g}{1+r}\right)} = \& \frac{CF_5}{(1+r)^5} \times \frac{(1+g)}{(r-g)} \tag{6}$$

By adding up the sum of cash flow and the terminal value, it can obtain the final DCF equation, which is Equation (7).

$$V = \sum_{t=1}^{n} \frac{CF_t}{(1+r)^t} + \frac{CF_t}{(1+r)^t} \times \frac{(1+g)}{(r-g)} \tag{7}$$

The Weighted Average Cost of Capital (hereafter WACC). While adopting the DCF model, it may find the absence of the value of the discount rate r. Therefore, the WACC is needed to calculate such figure. The specific equation is listed as follows in Equation (8).

$$WACC = \left(\frac{E}{V} \times R_e\right) + \left(\frac{D}{V} \times R_d\right) \tag{8}$$

In this equation, E represents the equity, Re refers to the cost of equity, D represents debt, Rd is the cost of debt after tax and V represents the total capital.

The Capital Asset Pricing Model (hereafter CAPM). While calculating the WACC, its cost of equity (R_e) remains ambiguous. Therefore, the CAPM can be adopted to figure out the cost of equity through the following formula in Equation (9).

$$r_i = r_f + \beta_i(r_m - r_f) \tag{9}$$

Where r_i stands for the cost of equity, β_i stands for the sensitivity coefficient, r_f stands for the risk-free rate and $(r_m\text{-}r_f)$ stands for the market risk premium.

2.3 The Relative Valuation Model

The objective of a relative evaluation is indeed different from the absolute one. While the absolute valuation model focuses more on the intrinsic perspective, the relative model measures an asset based on the market's valuation of comparable assets [7]. To begin with, it picks out a few reference enterprises that are relative to the target enterprise. Then, it analyzes and compares the related financial indicators of the target and reference corporation, respectively, and concludes [8]. Finally, it modifies the target company's value according to the previous conclusion. The model consists of three sub-models according to the difference in their ratio coefficients, which are the Price-to-Earing (hereafter P/E) model, the Price-to-Book Ratio (hereafter P/BV) model and the Price-to-Sales (hereafter P/S) model, respectively.

The P/E method. The P/E method is the most widely used and, at the same time, most reliable when evaluating the value of companies that are either unlisted or recently went public [9]. The basic equation is listed as follows in Equation (10).

$$PE = \frac{P}{E} \tag{10}$$

Where *P* stands for the price per share, and *E* represents the net profit per share. Furthermore, it is worth mentioning that the equation can be derived by multiplying the numerator and denominator with the total share capital *N*. (Equation (11))

$$PE = \frac{P * N}{E * N} \tag{11}$$

Where P*N represents the total market value, and E*N represents the total net profit. However, the P/E is a relative valuation indicator instead of an absolute judgment standard. It can not be treated as a direct standard in evaluating the corporation's value [10].

The P/BV method. The P/BV method calculates the ratio of a company's book value to its capital market value. Precisely speaking, it gauges the market's willingness to pay for each of the business's net assets [11]. (Equation (12))

$$PBV = \frac{P}{A} \tag{12}$$

Where *P* stands for the price per share, and *A* stands for the net asset per share. This method provides investors with a distinct and stable measurement; however, it involves measuring book value, which correlates with accounting principles. Therefore, different book values may be due to using different accounting principles, thus making the valuation somewhat unreliable.

The P/S method. The P/S method is suitable for assessing new-born companies or those with great potential. It shows how much investors are willing to spend on each unit of the business's sales, which makes it easy to calculate [12]. (Equation (13))

$$PS = \frac{P}{S} \tag{13}$$

Where *P* stands for the price per share, and *S* stands for the sales per share. Compared with the previous two methods, the P/S method will not yield a negative result, which can grant investors a meaningful multiplier. Nevertheless, it is not capable of reflecting the change in costs, which is significant when it comes to valuing the company. Furthermore, it is sensitive to certain parameters, such as sales, which may cause a substantial error in the result of valuation [13].

2.4 Problems in Valuation

Scarcity of comparable companies for benchmarking. The CCRC is an emerging industry that enjoys rapid development. The CCRC senior care sector has a promising future thanks to government support, which also motivates other businesses and

investors to enter the market. However, it also means that the companies vary in their scale and asset, thus posing difficulties in selecting a representative benchmarking company.

Difficulty in acquiring the previous data of the industry. The CCRC does not have a long history in China, most companies in the Chinese CCRC industry are still in its early operational phase. The companies will undoubtedly have few available data that is disclosed. Therefore, in certain time of the valuation, the parameters are predicted according to historical or empirical data, resulting in possible error in the final valuation process.

Limitation inherent in cash flow forecasting. Most of the CCRC industries have great potential in the future development. The actual cash flow of the companies may vary due to different market environment, certain operational decisions or executive adjustments. Therefore, a possible error may occur between the predicted value and the actual value.

3 Analysis and Discussion

3.1 Analysis of the Absolute Valuation Model

Based on the absolute evaluation model, it may conduct an array of calculation. This essay will stand on the perspective of 2018, and treat all the cash flow from 2018 to 2023 as the future cash flow. Next, all the cash flow will be discounted back to 2018 and calculate the theoretical value, thus comparing it with the actual value to come to a conclusion of whether the business performance of the corporation matches with the expectation. All the data used in this part are collected from the financial statement of Taikang Group [14-16].

3.1.1 Prediction of the Operating Revenue.

Table 1. Previous operating revenue

Year	2019	2020	2021	2022	2023	Average
Growth rate	23.59%	20.10%	7.01%	-10.53%	19.06%	11.85%
Revenue	203,815	244,782	261,933	234,340	279,004	

The data above indicates that the average growth rate of the operating revenue is 11.85%. (Table 1) Therefore, this essay assumes that during 2024 and 2028, the operating revenue of the company will keep increasing and the increase degree will decrease gradually. Eventually, considering that the enterprise can never keep an ascending revenue at the speed of above the GDP growth rate of the country, the essay assumes that the perpetual growth rate will remain at 4% from 2028. (Table 2)

Table 2. Predicted operating revenue

Year	2024	2025	2026	2027	2028
Growth rate	11.85%	10%	8%	6%	4%
Revenue	312,066	343,273	370,735	392,979	408,698

3.1.2 Prediction of the net Profit Rate.

Table 3. Previous net profit rate

Year	2019	2020	2021	2022	2023	Average
Net profit	21,802	23,701	24,448	10,710	12,567	18,645.6
Revenue	203,815	244,782	261,933	234,340	279,004	244,774.8
Ratio	10.70%	9.68%	9.33%	4.57%	4.50%	7.62%

The data above illustrates the average net profit rate. (Table 3) Therefore, this essay assumes that the net profit rate in the future 5 years will be 7.62%.

Table 4. Predicted net profit rate

Year	2024	2025	2026	2027	2028
Net profit	23,779	26,157	28,250	29,945	31,143
Revenue	312,066	343,273	370,735	392,979	408,698
Ratio	7.62%	7.62%	7.62%	7.62%	7.62%

According to the net profit rate, it may calculate the net profit from year 2024 to 2028. (Table 4)

3.1.3 Prediction of the Net Operating Cash Flow.

Table 5. Previous net operating cash flow

Year	2019	2020	2021	2022	2023	Average
Net profit	21,802	23,701	24,448	10,710	12,567	18,646
CF_o	64,266	87,953	90,052	137,867	154,422	106,912
Ratio	2.95	3.71	3.68	12.87	12.29	5.73

To predict the operating cash flow, it need to figure out the ratio between the net profit and the operating cash flow (CF_o) of the previous years and calculate the average ratio. (Table 5)

Table 6. Predicted net operating cash flow

Year	2024	2025	2026	2027	2028
Net profit	23,779	26,157	28,250	29,945	31,143
CF_o	136,254	149,879	161,872	171,585	178,449
Ratio	5.73	5.73	5.73	5.73	5.73

Next, it can use the average ratio to predict the operating cash flow in the following years. (Table 6)

3.1.4 Prediction of the Capital Expenditure.

Table 7. Previous expenditure

Year	2019	2020	2021	2022	2023	Average
Expenditure	4,029	12,547	10.130	9,659	10,650	9,403

After calculating the average fund-raising cashflow, it may use the value in predicting the future cash flow. (Table 7, 8)

Table 8. Predicted expenditure

Year	2024	2025	2026	2027	2028
Expenditure	9.403	9.403	9.403	9.403	9.403

Prediction of the free cash flow. The following formula is used to determine the free cash flow. (Equation (14))

$$FCF = CF_0 - Expenditure \tag{14}$$

Table 9. Free Cash Flow

Year	2024	2025	2026	2027	2028
CF_o	136,254	149,879	161,872	171,585	178,449
Expenditure	9,403	9,403	9,403	9,403	9,403
FCF	126,851	140,476	152,469	162,182	169,046

The calculated free cash flow can be substituted into the equation later. (Table 9)

Prediction with the CAPM. First, the cost of equity should be calculated based on the CAPM. For the risk free rate, the nation debt in 2023 was 2.8%. Furthermore, for the insurance market, the generally accepted risk premium and the coefficient β_i is 6% and 1.1 respectively. Therefore, according to the data, the cost of equity can be obtained in Equation (15).

$$r_i = r_f + \beta_i(r_m - r_f) = 9.4\% \tag{15}$$

Prediction with WACC. Next, according to the data disclosed in the corporate annual report, the WACC should be acquired, which is also the discount rate. However, before substituting the figure into the equation, certain figures need to be calculated.

The equity E equals to the sum of the equity of both parent and shareholders. Moreover, the debt D is the sum of both bonds payable and the money for selling financial asset that is repurchased. Furthermore, Moreover, the sum of debt and equity is the total capital V. Besides, the cost of equity is calculated through the CAPM and the cost of debt is calculated through the following equation (16).

$$R_d = profit \times (1 - tax\ rate) \tag{16}$$

The figures will be demonstrated distinctly in the chart below. (Table 10)

Table 10. Data for calculating WACC

Figure	Calculation	Result
Equity (E)	137,301+594	137,895
Debt (D)	5,997+2675+122,698	131,370
Total Capital (V)	137,895+128,695	269,265
Total tax expense	196+134+3,681	4,011
Tax rate (T_c)	2,276/10,291	22.1%
Cost of Equity (R_e)		9.40%
Cost of Debt (R_d)	4,011/131,370	3.05%

Finally, the figure can be substituted into the formula. (Equation (17))

$$WACC = \left(\frac{E}{V} \times R_e\right) + \left(\frac{D}{V} \times R_d \times (1 - T_c)\right) = 5.97\% \tag{17}$$

After calculating the discount rate, it may get back to the DCF equation. After taking the GDP growth rate and the inflation into consideration, it may assume that g is roughly 4% from Equation (18). And the value is 8,094,292.81

$$\begin{aligned} V &= \sum_{t=1}^{n} \frac{CF_t}{(1+r)^t} + \frac{CF_t}{(1+r)^t} \times \frac{(1+g)}{(r-g)} \\ &= \sum_{t=1}^{5} \frac{CF_t}{(1+r)^t} + \frac{CF_5}{(1+r)^5} \times \frac{(1+0.04)}{(5.87\% - 4\%)} \end{aligned} \tag{18}$$

The computation's outcome suggests that the company has a lot of room to grow.

3.2 Analysis of the Relative Valuation Model

Based on the relative valuation method, it may conduct a more comprehensive assessment of the enterprise. The data that is required for calculation is extracted from the annual report and listed in the following chart.

Table 11. Data for calculating the relative valuation model

Figure	Value
Estimated market capitalization	1,556.28
Net profit	125.67
Net asset	1,378.95
Operating revenue	2,790.04

First, for the price earnings ratio, it simply need to divide the market capitalization with the net profit, which is 12.38. It is generally acknowledged that if the value of PE ranges between 0 and 13, it means that the value of the company is underestimated. Therefore, it may come to a conclusion that the current value of the company in 2023 is underestimated and should be higher. (Table 11)

Next, for the price to book ratio, it need to divide the market capitalization with the net asset of the corporation, which is 1.13. The PB of the corporation is rather low, meaning that the company will receive less risk from the market. If the company unluckily goes bankrupt, the shareholders can withdraw more asset that is invested previously.

Finally, for the price to sales ratio, it need to divide the market capitalization with the operating revenue. The PS of Taikang remains at a rather low level, which is 0.56, which means that the daily operation of the enterprise will receive less risk.

3.3 Discussion

There are certain reasons why such calculation results occur. To begin with, it may easily observe that such industry is almost risk-free according to the PB and PS. The CCRCs are just at the beginning phase in the Chinese society. It is indeed a new-born industry remained to be explored and nurtured. Therefore, enterprises in such field are granted with a competition that is less fierce, abundant time to develop and adequate chances for making mistakes, thus making the industry less risky than others. Besides, it may also witness that the value of the companies tends to be underestimated. There are several reasons why such phenomenon occurs. On the perspective of the society, the CCRC is new, but is way too new and innovative. In terms of the welfare of their parents, the children of the elderly people may prefer choosing an approach that is typical and trustworthy instead of an innovative way that may not necessarily be reliable or practical. From the perspective of the economy, the CCRCs expense will be a vital problem for most individuals. The CCRCs usually cooperates with insurance companies and is provided as a value-added service, creating a high entrance threshold. Moreover, for those independent CCRCs, they charge substantial entrance fee and collects considerable operating fee annually. The expensiveness of CCRC makes it a less preferrable choice for most consumers [17], thus making the valuation of the companies being underestimated.

4 Conclusion

A significantly higher percentage of older people will result from the anticipated shift in the age distribution of industrialized nations. China is a typical representative of such countries. From the year of 1949 to 2025, China has gradually become industrialized and modernized, resulting in the ascend in the amount of elderly people and pressure for the society. The public policymakers are only now starting to recognize that the population is aging at an accelerated rate, resulting in certain welfare crisis among the old all over the globe.

The society and countries require an effective and innovative way to resolve such concerning problem, which is exactly the purpose of this essay: providing a reliable and conceivable assessment for the current situation of CCRC and having a deep insight into possible suggestions for improvement.

There are mainly two valuation models adopted in this essay, which are the absolute valuation model and the relative valuation model. The two models are different in their applications and methods, thus combining the two models for analyzing will be a preferred method.

The result of analysis illustrates that the CCRC is currently a less risky industry and tends to be underestimated. Such a thing is intended to receive less risk but less popularity at the same time, which leads to the CCRC being underestimated because of its costly, novel, and innovative intrinsic characteristics.

The previous analysis suggests that the CCRC is a promising and growing industry that is capable of implementing certain improvements. However, ameliorating the CCRC requires the cooperation between the government, the society and the corporation itself.

First and foremost, the government ought to be a key player in promoting the growth of the CCRCs. The fiscal situation of the companies will undoubtedly be ameliorated through legislative and governmental policies, which will at the same time improve the popularity of the CCRCs. For example, government may provide subsidies to people intending to purchase the such elderly-care services to stimulate consumption. Besides, the government should be promoting the standardization within the industry, which may improve the overall service quality and boost the profitability of the company at the same time.

The CCRC is a preferred option for senior care for a number of reasons such as pressure in family elderly care. The old people nowadays face serious problem in their activity of daily living (ADL) and requires aids from relatives. Therefore, their children will have to devote considerable time into looking after them. This actually endows adults an additional task, poses a threat to their balance between work and daily life for adults and increases their pressure. Nowadays, most adults are facing the dilemma of looking after their parents and children at the same time. Therefore, the entities in the society such as communities or elderly care institutions should grasp the chance and encourage the adults to choose the CCRC. For example, communities may publish an authoritative report on the CCRC, thus enhancing the confidence of consumers. Furthermore, traditional elderly care institutions may advance industrial upgrade by imitating the CCRC mode, thus enhancing the competitiveness.

The previous research indicates that the high expense is the primary concern of the citizens. Therefore, the corporation may consider adjusting the approach of payment to flexibly. Moreover, the company can improve the transparency of the fiscal data and the fee, which strengthens the confidence of the consumers.

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