Proceedings of the 2023 International Conference on Management Research and Economic Development
DOI: 10.54254/2754-1169/18/20230082

REITs Analysis of Industrial Parks

—Take CCB Zhongguancun Industrial Park REIT for Example

Shuyu Wang[1,a,*]

[1]Computer Science and Business Administration (CSBA), Financial Engineering, Viterbi School of Engineering, University of Southern California, 1150 South Olive Street, Suite 1700, Los Angeles, CA, 90015 US
a. hahazuiniu@gmail.com
**corresponding author*

Abstract: In 2021, China's public offering infrastructure REITs officially set sail. The 21 public offering REITs products and projects that have been issued have excellent qualifications and are popular among institutional and individual investors, laying a solid foundation for the healthy development of the subsequent REITs market. Industrial parks usually have the advantages of clear property rights, stable income and value-added potential, and are an important part of the infrastructure REITs pilot. This paper reviews the market performance and typical characteristics of industrial park REITs since establishment, and, on this basis, analyzes the valuation methods applicable to industrial park REITs. Taking CCB Zhongguancun REIT as an example, starting from the location and operating status of the underlying assets and through the fundamental comparison of similar projects and P/FFO valuation, the research concluded that the market valuation of the project was at a high level in the industry and reached the average valuation level of industrial REITs in the United States, the good operating performance supported its market valuation. Finally, the future growth potential, operation management, and investment prospects of the industrial park REITs are prospected.

Keyword: industrial park REITs, Zhongguancun industrial park, valuation and pricing, P/FFO

1. Introduction

In April 2020, the China Securities Regulatory Commission and the National Development and Reform Commission jointly issued the Notice on Promoting the Pilot Work of Real Estate Investment Trusts (REITs) in the Field of Infrastructure, marking the official setting sail of publicly offered REITs [1]. It aims to invigorate the infrastructure investment and financing market, to achieve a virtuous cycle of infrastructure project investment and financing, and to open up new channels for institutional, pension, public, and other funds to participate in infrastructure investment.

Chinese public offering REITs have the same characteristics as standard REITs in terms of asset structure, income distribution, and other aspects, but the transaction structure is similar to that of the class REITs, but obviously different from the standard REITs. According to the organizational form, overseas REITs can be divided into corporate and contractual types. According to the Trust Law and the Company Law of the United States respectively, overseas REITs belong to trust products and

DOI: 10.54254/2754-1169/18/20230082

corporate legal body respectively in essence [2]. At present, we adopt the structure of "public offering funds + asset-backed securities (ABS)" to hold the equity of the project company, which is similar to the contract frame.

In June 2021, the first batch of public REITs was listed and traded on the Shanghai and Shenzhen Stock Exchanges. Together with the second batch of listed projects, the total amount of funds raised reached 36.41 billions yuan. The industries cover toll roads, industrial parks, warehousing and logistics, and ecological and environmental protection fields, covering the Beijing-Tianjin-Hebei region, the Yangtze River Economic Belt, the Guangdong-Hong Kong-Macao Greater Bay Area, etc. The original equity holders of the underlying assets are mostly central government-owned enterprises, local state-owned enterprises, listed companies, etc., and the overall project qualification is excellent. China's industrial park assets have a large scale, coupled with rich categories, stable cash flow and profit status, high market activity, and clear pricing logic. As the underlying asset of public offering REITs, they have many advantages.

Although the first and second batches of industrial park REITs listed on the first day of listing achieved a large increase in prices, they later appeared to experience a large price fluctuation, which triggers the question of whether the issue price is reasonable. Appropriate pricing not only helps investors get returns in line with the risks at the beginning of the issuance period, but also provides a benchmark for investors to compare prices later.

This paper takes CCB Zhongguancun REIT as the research object, analyzes and introduces its organizational structure, transaction structure, basic assets, and other basic information, and focuses on the analysis of its investment value from the perspective of valuation. The future growth potential, operation management, and investment prospects of the industrial park REITs are forecasted.

2. Industrial Park REITs Market Status

The REITs in mature overseas markets are mainly of equity types, and the investment objects include both the traditional commercial real estate assets and infrastructure assets. Up to now, more than 30 countries in the world have issued REITs products. At present, the largest market is in the United States, whose REITs market value exceeds 11 trillion yuan, accounting for about 3% of the stock market (only 0.05% in China), far exceeding the traditional real estate development industry [3].

The public offering REITs currently being piloted in China take infrastructure projects as the underlying assets. Compared with REITs-like products, REITs are equity asset management products, with their earnings completely linked to the underlying assets and stripped of the subject credit. At present, China's infrastructure public offering REITs give priority to supporting the infrastructure industries to strengthen weak spots. Real estate projects such as hotels, shopping malls, office buildings, apartments, and residential buildings are not included in the current pilot scope [4].

Industrial park REITs are an important part of China's infrastructure REITs market, among which the assets of industrial parks with higher maturity and conforming to the conditions of asset formation mainly include R&D buildings, standard workshops, and incubators based on industrial land or scientific research land. Due to the high technological innovation value and economic value of such assets, they usually have advantages such as clear property rights, stable income, and value-added potential, which are very consistent with the characteristics of China's pilot infrastructure REITs products, and have the market conditions for the continuous expansion and strengthening of REITs products [5].

On June 21, 2021, Boshi Shekou REIT, Hua'an Zhangjiang REIT and Soochow Suyuan REIT were listed as the first batch of projects, followed by CCB Zhongguancun REIT on December 17, 2021. The issuance scale of REITs in the four industrial parks totaled 9.946 billion yuan, second only to that of expressways. From the perspective of issuance terms, the durations of Boshi Shekou REIT, Hua 'an Zhangjiang REIT, Soowu Suyuan REIT and CCB Zhongguancun REIT are 50 years, 20 years,

DOI: 10.54254/2754-1169/18/20230082

40 years and 45 years respectively, which are mainly determined by the tenure of land use right. In terms of cash flow distribution rate, the expected cash flow distribution rate of the four projects in 2021 and 2022 is about 4.1% to 4.8%, which is lower than that of the franchise REITs. Among them, the expected allocation rates of CCB Zhongguancun REIT and Soowu Suyuan REIT are relatively high, Boshi Shekou REIT is the lowest, and Hua'an Zhangjiang REIT has relatively large fluctuations. From the perspective of underlying assets, the underlying assets of Boshi Shekou REIT and Hua'an Zhangjiang REIT are Wanhai Building, Wanrong Building, and Zhangjiang Everbright Park, respectively, and their land properties are for industrial use, while the underlying assets of Soowu Suyuan REIT are 2.5 industrial parks, and the land properties are for scientific research and design, and industrial use. The underlying asset of CCB Zhongguancun REIT is the Internet industrial park, and the land property is for science and education use.

3. REITs Characteristics of Industrial Parks and the Applicability of Valuation and Pricing Methods

3.1. Industrial Park REITs Asset Characteristics and Key Points of Concern

Similar to warehousing and logistics, long-rent apartments, office buildings, and retail properties, industrial parks have assets that can generate stable cash flows continuously. Their sources of income include rent, property fees, enterprise services, and value-added services. The combination of an industrial park and RETIs can increase the liquidity of the existing assets, so that the development risk of an industrial park is no longer limited to the original stakeholders and related parties, social capital can have the opportunity to participate in the establishment and development of the industrial park, and the problems of a long development cycle and large capital demand can be effectively alleviated [6].

From the perspective of asset characteristics, the ROI of industrial park assets is stable, and the underlying assets have great potential for appreciation: high-quality park assets have potential for appreciation and can bring a return on asset appreciation. As a property rights project, the industrial park has the ownership of its underlying assets. With the increase in rent and the number of enterprises, the assets of the industrial park will continue to appreciate in addition to the interval operating income. At the same time, it can also expand the scale of underlying assets through asset acquisition, which will bring investors value-added returns in addition to the basic rate of return. Therefore, this kind of asset will attract investors who expect to maintain and increase the value of assets to achieve high, stable returns, such as securities companies and insurance companies [7].

As for the REITs of industrial parks, the main income source of the basic assets of industrial park REITs is tenant rent, so the factors that have a great impact on their cash flows are mainly rental income scale and rental stability. The scale of rental income is affected by project location conditions, rental level and growth, and rental rate. The stability of rent is affected by the situation of tenants (distribution and concentration of tenants' industries) and the situation of leases (concentrated expiration and renewal rates). In general, the higher the city's energy level, the more concentrated the industrial sector, combined with relatively balanced supply and demand sides of the industrial park, the higher the industrial park's rental rate can usually be achieved, and the higher the rent's growth potential. In terms of project location, the rental rate, rent level, and capitalization rate of different cities and industrial parks can be compared in recent years.

3.2. Applicability of REITs Valuation Methods

The methods commonly used by overseas financial institutions to evaluate REITs can be divided into three categories: cost method, income method, and market method. The cost method refers to the valuation method that takes the value of the underlying assets held by REITs as the core and deducts

DOI: 10.54254/2754-1169/18/20230082

liabilities and expenses on it to determine the net assets of REITs. The specific method commonly used is the net asset value model. The income method refers to the valuation method used to determine the value of REITs by discounting its expected earnings cash flow. The specific method commonly used is the dividend discount model (DDM). The market method refers to the valuation method that determines the value of REITs by comparing it to the market price of a comparable sample. The specific methods commonly used include market price/net operating cash flow multiplier (P/FFO) and market price/adjusted net operating cash flow multiplier (P/AFFO) [8].

Since the development stage and information disclosure requirements of the Chinese public offering REITs market are different from those of overseas markets, the valuation methods commonly used overseas cannot be directly applied to the Chinese public offering REITs market. Exploring the valuation methods in line with the risks of Chinese public offering REITs market will not only help investors obtain returns consistent with the risks at the beginning of the offering period, but will also provide a price scale for the subsequent participation of investors.

In terms of the cost method, the use of the direct capitalization method depends on the premise that the income of the underlying asset is sustainable and stable. At present, the underlying assets of Chinese public REITs are generally divided into two types: franchise and property rights. The franchise has a limited income period, so direct capitalization method is not applicable. Income from property rights will change greatly with the changes of the rental market (rent, rental rate). Meanwhile, due to the nature of the property tenure of real estate in China, the sustainability of income may not be guaranteed, so the direct capitalization method is not applicable. In contrast, using the discounted cash flow method to evaluate the underlying assets is more in line with the characteristics of the underlying assets of Chinese public REITs.

In terms of the market method, the use of the market method for valuation requires the selection of comparable REITs that are similar to the target REIT in terms of underlying asset type, location, construction time, and financial leverage. The important reason why P/FFO and P/AFFO valuation are widely used in the US market is that the US REITs market is relatively mature and there are sufficient comparable REITs samples. At present, the number of publicly offered REITs listed in China is small, and market valuation is not applicable at the current stage. However, the P/FFO method provides an effective way to compare projects of the same type.

In terms of the income method, it is feasible to use the DDM model to estimate the share of public REITs in China. Since the income of infrastructure assets is relatively stable and the dividend ratio of the fund is stable, the future dividends of the fund can be predicted more accurately by referring to the historical operating data of the same type of assets. The discount rate can be determined by referring to the capital costs of the same type of listed companies or using the risk accumulation method, with timely adjustments according to the market trading prices [9].

The project valuation focuses on the two core factors of discount rate and rental income growth forecast, and compares the valuation rationality with the capitalization rate. The lower the discount rate and the higher the expected growth rate of rental income, the higher the valuation of the industrial park and the more expensive the price. If the actual rental income falls short of expectations in the future, it may have an adverse impact on the price of industrial park REITs.

4. Case Study of CCB Zhongguancun REIT

4.1. Basic Information of CCB Zhongguancun REIT

4.1.1. Product Overview and Transaction Structure

CCB Zhongguancun REIT (508099.SH) was listed on the Shanghai Stock Exchange on December 17, 2021, with a duration of 45 years, an issuance scale of 2.88 billion yuan, and an offering share of

900 million. The originator is Zhongguancun Development Group Co., Ltd., and the original owner and operation management agency is Beijing Zhongguancun Software Park Development Co., Ltd.. The underlying assets are Building 5 of the Internet Innovation Center, Building 4 of the Collaboration Center, and 3 buildings of the Incubation Accelerator, all located in Zhongguancun Software Park.

Table 1: Information of main participants[10].

Project Content	Project Content
Person of original interest	Beijing Zhongguancun Software Park Development Co. LTD
Infrastructure assets	Building 5 of Internet Innovation Center, Building 4 of Collaboration Center and Incubation Accelerator Project
Infrastructure Project Company	Beijing China Development No. 1 Technology Service Co., LTD
Operation management organization	Beijing Zhongguancun Software Park Development Co. LTD
Fund manager	CCB Fund Management Co., LTD
Asset Support special plan	CCB Zhongguancun Industrial Park asset support special plan
Special Project Manager	CCB Capital Management Co. LTD

Specifically, the transaction structure of CCB Zhongguancun REIT has two main layers, namely, the special plan and the infrastructure fund. The fund manager (on behalf of the Infrastructure Fund) holds all the shares of the special plan, and the plan manager (on behalf of the special plan) holds 100% of the equity and the corresponding liabilities of the project company.

4.1.2. Underlying Asset Overview

Operating indicators in the recent 3 years. Incubator: Excluding the impact of the COVID-19 epidemic in early 2020 and the rent and tax relief provided by the Beijing Municipal government to commercial tenants, the annual growth rate of the operating income of this asset in the past three years is about 1.2%, and the operating cost is basically flat every year, so the net operating cash flow has shown a slight growth in the past three years. In terms of the rental rate, after a brief adjustment after the outbreak of COVID-19, the rental rate has steadily picked up and reached 100% by the end of 2020.

Building 5 of the Internet Innovation Center, as the settled enterprises are mostly the leading enterprises in the domestic high-end and sophisticated industrial fields, with high leasing capacity, it can be seen that the annual growth rate of operating income in the past three years is nearly 5%. The rental rate remained at 95 percent despite the COVID-19 pandemic.

Building 4 of the Collaboration Center is highly resistant to risks due to the introduction of Duxiaoman Finance, a leading enterprise in the industry owned by Baidu. According to the data of the past three years, the leasing income and rental rate of its underlying assets have not been affected even in the face of emergencies such as the novel coronavirus outbreak.

It can be seen that, in general, the higher the degree of dispersion of tenants, the higher the degree of stability of earnings. However, the introduction of a single or a few leading enterprises as tenants reflects its advantages in the face of extreme market conditions. The risk resistance of the underlying assets is improved to ensure that they generate continuous and stable cash flows.

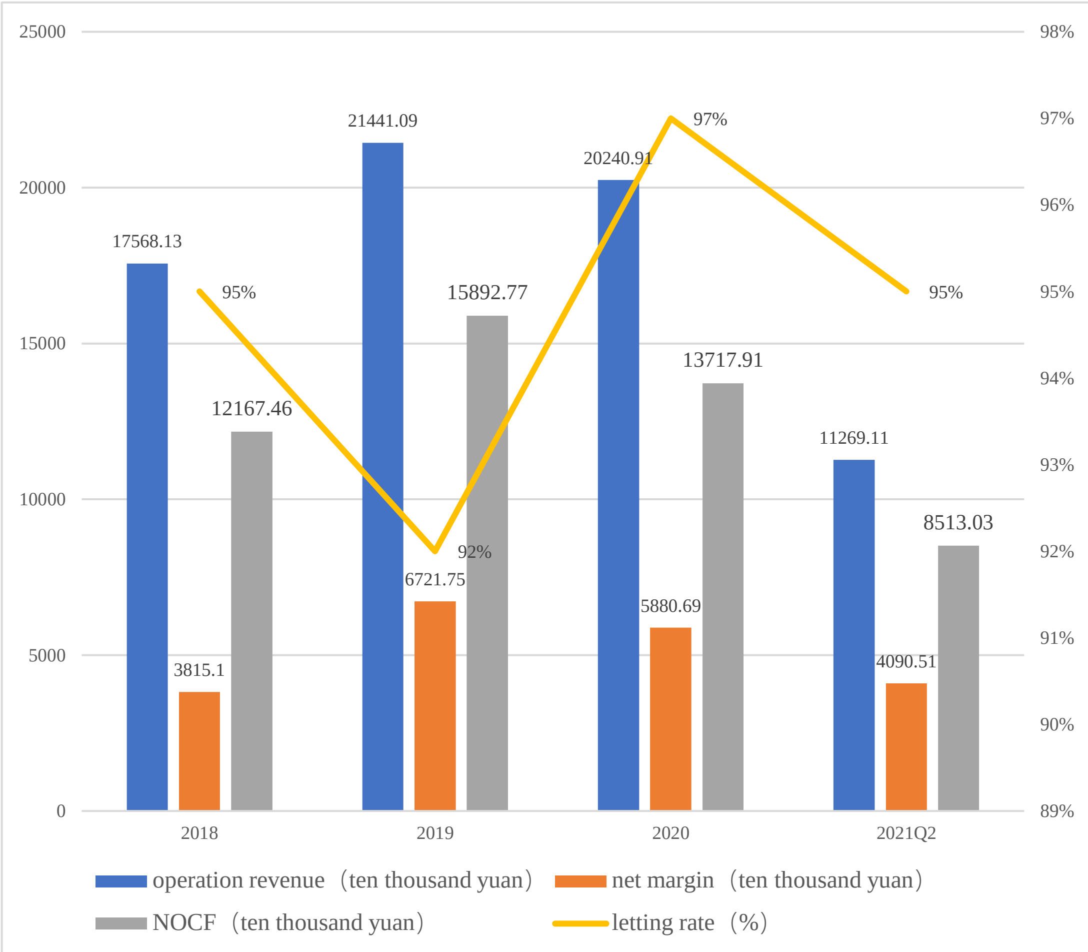

Figure 1: Operation of underlying assets [10].

Analysis of current operating indicators. In order to reflect the sources of income and the proportions of various costs and income more intuitively, this paper adopts the method of waterfall diagrams, defines the total operating income of the underlying infrastructure assets as 100, and compares and analyzes the situation of the sources of income and the proportion of cost expenditure of the three assets.

In terms of operating net cash flow, the assets of Incubation Accelerator and Internet Innovation Center Building 5 are lower than those of Synergy Center Building 4, which is mainly caused by the higher operating costs, indicating that the operation managers need to put more effort into service management while adopting the external decentralized leasing method to disperse risks.

In terms of income sources, the two assets of the incubator accelerator and Building 5 of the Internet Innovation Center need to be equipped with necessary business supporting facilities to meet the daily needs of tenants because they are distributed to individual tenants. Building 4 of the collaboration center is rented by a single tenant as a whole, so the related supporting facilities are configured by the tenant on the premise of not violating the use specifications.

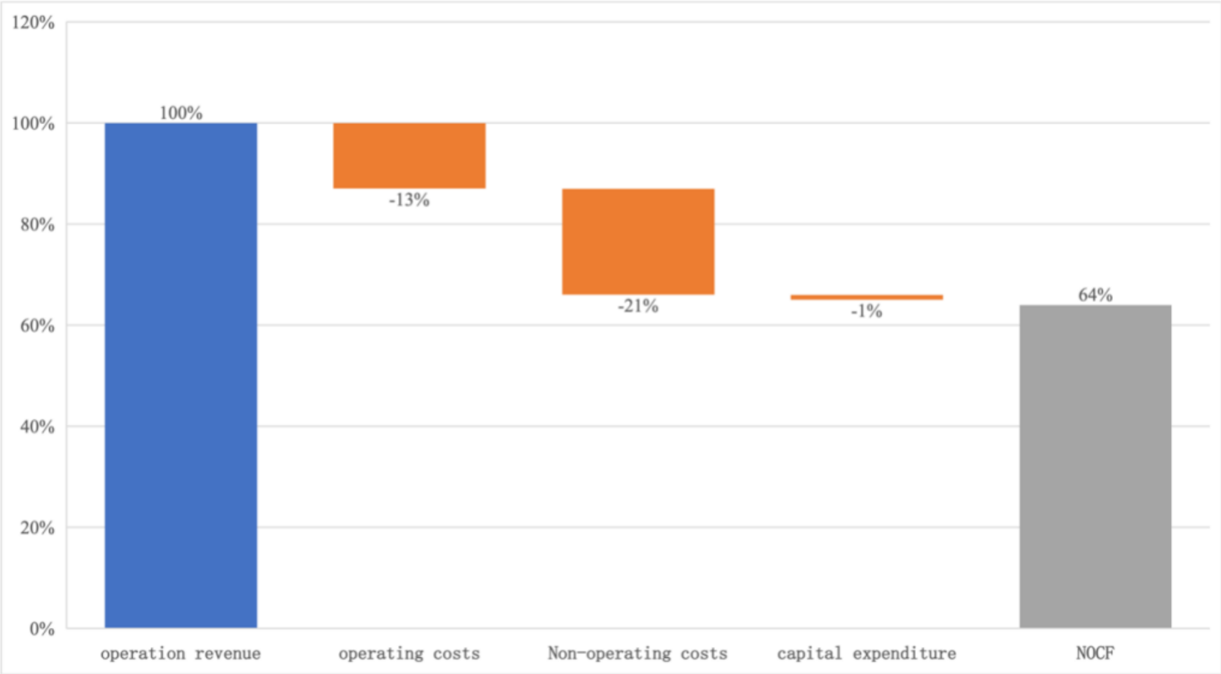

Figure 2: Analysis of income source and cost composition of incubation accelerator [10].

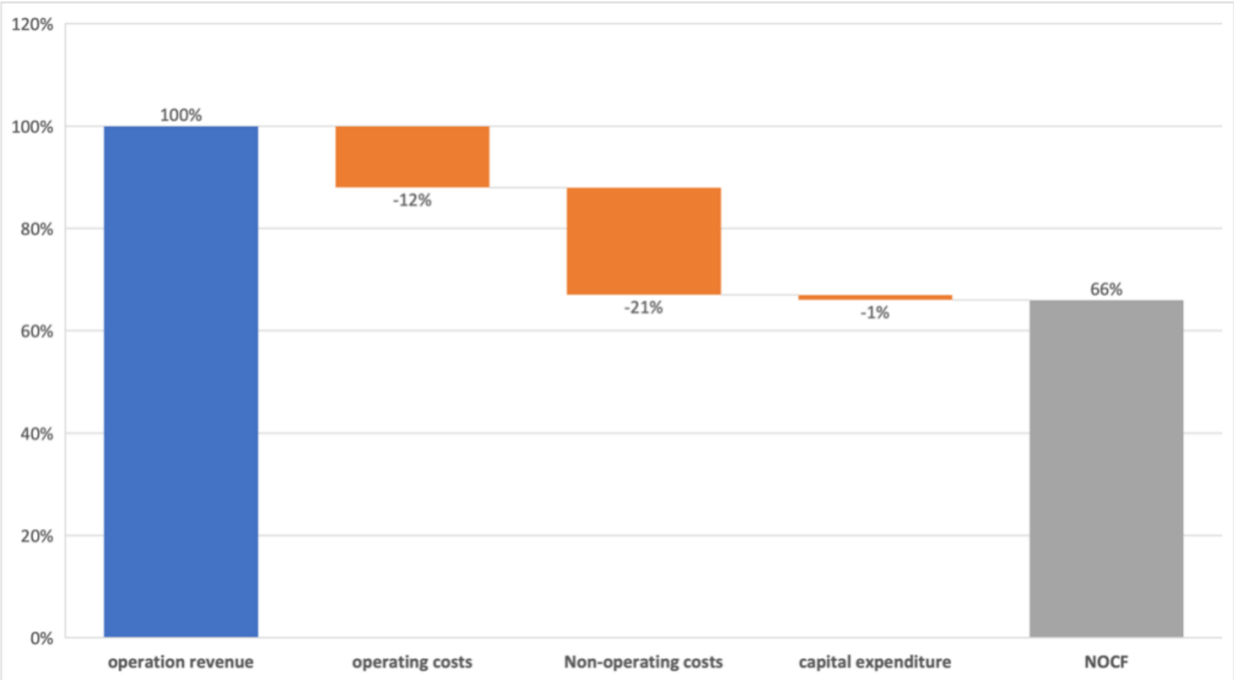

Figure 3: Income source and cost composition analysis of Building 5 of Internet Innovation Center [10].

DOI: 10.54254/2754-1169/18/20230082

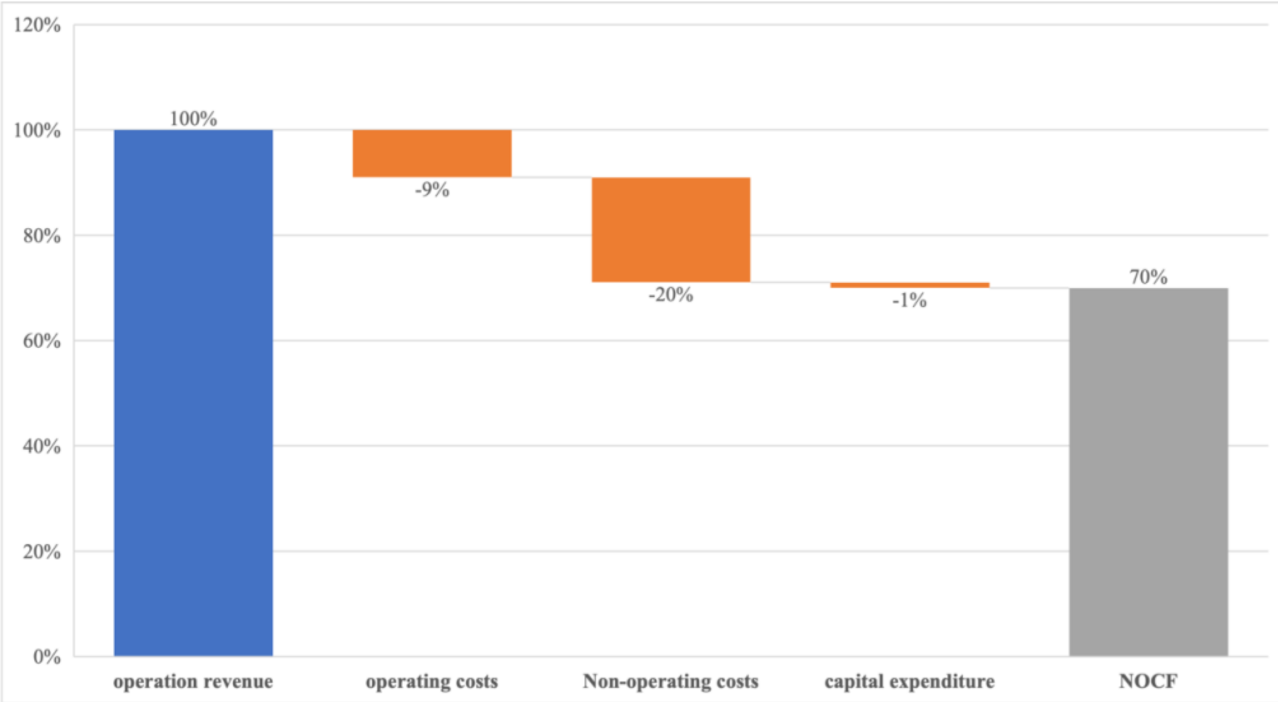

Figure 4: Analysis of revenue sources and cost composition of Building 4 of the Collaboration Center [10].

Analysis of tenant status structure. As of the time of value, the incubator was rented to 13 tenants (including 10 R&D tenants and 3 industrial supporting tenants). Building 5 of the Internet Innovation Centre was leased to 51 tenants, with the top 10 tenants accounting for 62.47% of the total leased area. Building 4 of the Collaboration Center was settled by Du Xiaoman Finance and its affiliated companies.

In terms of tenant structure, the collaborative center mainly focuses on science and technology promotion and application services, accounting for up to 84%. Building 5 of the Incubation Accelerator and Internet Innovation Center is dominated by the software and information technology service industries, accounting for more than 65% of the total. Among them, Building 5 of the Internet Innovation Center has introduced iFlytek, Nengke, Quantumctek, and other leading enterprises, and the incubation accelerator has introduced the headquarters of high-growth technology enterprises such as Kuaishou.

In terms of the leased area, Building 4 of the Collaboration Center is mainly dominated by large-area tenants and their associated tenants, with about 96.3% of tenants having leased areas over 2,000 square meters. Building 5 of the Internet Innovation Center is mainly occupied by tenants with less than 2,000 square meters. Medium and large enterprises account for a relatively small number of tenants, and the number of tenants is large. In the future, there will be certain pressure on tenant stability and tenant management. The incubation accelerator is dominated by large-area tenants. The leased area of the four enterprises is more than 2,000 square meters, accounting for 88% of the leased area of the R&D space.

Lease period analysis. The lease term of the signed tenants of Building 4 of the Collaboration Center is 2-5 years; the lease term of the signed tenants of Building 5 of the Internet Innovation Center is 1-5 years; and the lease term of the signed tenants of the incubation accelerator is 1-3 years. Excluding the influence of the whole tenant, the lease term of the tenants of the three properties is mostly 2-4 years.

DOI: 10.54254/2754-1169/18/20230082

4.1.3. Advantages of CCB Zhongguancun REIT

Based on the location and operating indicators of the underlying assets, this paper summarizes three advantages of CCB Zhongguancun REIT:

Location advantage. The infrastructure project is located in Zhongguancun Software Park, Shangdi District, Haidian District, Beijing. It is the first comprehensive high-tech industrial cluster area in China, which is dominated by the electronic information industry and integrates scientific research and development, production, operation, training, and service. This area gathers together Zhongguancun Software Park, Shangdi Information Industry Base, and other high-tech industrial parks, and gradually becomes a gathering area for high-tech industrial enterprise headquarters and enterprise R&D headquarters.

Industrial advantages. Known as the "Silicon Valley of China", Zhongguancun Software Park is the first state-level high-tech industrial development zone. Since its establishment, Zhongguancun Software Park has always adhered to the overall development idea of "government-led and market-based operation", taking the lead in forming a national leading characteristic industrial cluster in artificial intelligence, big data, 5G, cloud computing, mobile Internet, quantum science, and other aspects. The park covers a total area of 2.6 square kilometers, with a total construction area of 620,000 square meters in the first phase and 1.33 million square meters in the second phase. By 2020, the park has gathered more than 700 IT enterprise headquarters and research and development centers, employing 94,500 people, with a total output value of 336.6 billion yuan and an output value of 130 billion yuan per square kilometer. The output per unit density of the park is in the leading position in China.

Advantages in transforming scientific and technological achievements. Zhongguancun Software Park is close to Tsinghua University, Peking University, Chinese Academy of Sciences, and many other colleges and universities, which provide strong support for talent transfer and technology support for the subsequent development of the industrial park. With the continuous improvement and optimization of the industrial environment and services in the park, high-end talents continue to gather in the park, and new technologies, new products, new applications, and new achievements obtained by enterprises are surging. In terms of independent innovation, in 2020, the enterprises in the park invested 38.1 billion yuan in R&D, accounting for 11.3 percent of the total investment. The total number of intellectual property rights is 65,632. The enterprises in the park have won 45 national science and technology progress awards, including 1 grand prize of the National Science and Technology Progress Award, 7 first prizes of the National Science and Technology Progress Award, and 526 technological achievements transformation.

4.2. Valuation and Market Performance of CCB Zhongguancun REIT

4.2.1. Valuation

As mentioned above, the valuation of Chinese public REITs is anchored by the value of the underlying assets. In terms of specific operations, when REITs are listed, the value of underlying assets is measured by the fair value method in the simulated consolidated statement at the fund level, and the net asset value (total assets - total liabilities) of the fund is calculated accordingly, namely the NAV, and the inquiry is carried out on this basis. The value assessment of the underlying assets generally adopts the income method, which is also the main valuation method for the infrastructure project evaluation clearly stipulated by the regulation [11].

In practice, the income method involves the prediction of cash flows and the determination of the discount rates. As for the expected rent growth rate, according to the asset evaluation report, the rent growth rates of China Merchants Shekou, Hua'an Zhangjiang, and CCB Zhongguancun will fluctuate differently, but the compound growth rate in the next 15 years will be around 2.2%~3.0%, with a similar growth trend in general, and the growth rate of Soowu Su Garden will be around 2%~4%. The expected rent is calculated according to the time rental unit price and expected growth rate of each asset's valuation. The future rent of CCB Zhongguancun Innovation Center, Collaboration Center and Zhangjiang Everbright Park is relatively high, which is expected to exceed 225 yuan per square meter per month in 2033, while that of CCB Zhongguancun Incubator and Shekou Wanhai Building is slightly lower, which is expected to exceed 200 yuan per square meter per month in 2033. The Shekou Wanrong Building is expected to be the lowest among the three REITs, which are expected to reach 173 yuan per square meter per month in 2033. In addition, the vacancy rate of each infrastructure according to the valuation time data forecast, is overall stable. As for the discount rate, the discount rate of Soochow Su Garden is the highest, which is 6.5%, and the corresponding risk premium is the highest. The other three projects all adopt 6%. The main reason is that Soochow Su Garden is located in Suzhou, and its location advantage is slightly weaker than that of the other three projects, and its rent is also significantly lower than that of the other three projects.

According to the valuation results, the underlying asset valuation of CCB Zhongguancun REIT is not high, around 15,000~22,000 yuan per square meter, while the comparable asset trading price in Beijing in the past two years is around 15,000~45,000 yuan per square meter. The underlying asset valuation of Zhangjiang Everbright REIT and Boshi Shekou REIT is relatively high, around 25,000~29,000 yuan per square meter.

Table 2: REITs valuation comparison of industrial parks[10].

Indicators	Boshi Shekou REIT		Zhang Jiang Ever-bright REIT	Soochow Soyuan REIT		CCB Zhongguancun REIT		
	Wan-rong Build-ing	Wan-hai Build-ing	Zhang-jiang Ever-bright Garden	Science and Tech-nology Park	Indus-trial Park	Wan-rong Build-ing	Wanhai Building	Zhang-jiang Ever-bright Garden
Rate of discount	6.0%		6.0%	6.5%		6.0%		
Remaining life of land	45y		34y	34y	38y	42.17y	42.94y	42.05y
Valuation time NOI (ten thousand Yuan)	3,689.88	6,381.63	7,939.66	8,585.93	5,953.82	7,367.78	3,587.38	4,543.55
Market Rent (RMB/m2 / month)	Research and development room: 121~131 Matching: 88~238		162.3	43.2	56~75	166	175	160

Table 2:(continued).

Vacancy rate	-		0 inside the lease, 5 outside the term	-		10%	1~2y: 0% 3~10y: 2%	1~2y: 15% 3~10y: 10%
Valuation (100 million Yuan)	10.35	14.99	14.80	18.35	15.25	15.48	7.12	8.13
Unit Area valuation ($/ m2)	24,816	27,970	29,050	5,600	6,000	18,842	22,388	15,392
Capitalization rate in 2021	4.44%		4.73%	4.88%	4.43%	4.76%	5.04%	5.59%
Comprehensive value of assets	-		101.52%	86.76%	76.02%	178.19%	176.47%	116.41%

4.2.2. Market Performance

Since the emergence of REITs products in June 2021, the market has developed stably and steadily. As of October 21, 2022, the comprehensive rate of return of REITs reached 29%, including 40% for property rights, the total market value of listed products reached 72.8 billion yuan, and the market value of circulation reached 33.8 billion yuan. From the beginning of the year to October 21, 2022, the comprehensive return of REITs reached 4.9%, significantly outperforming the stock market, bond market, gold, and other assets. Historical data over the past year show, that the current REITs are far more similar to bonds than stocks. The correlation coefficient between REITs and the CSI all-Bond Index reaches 0.77, while that between REITs and the CSI 300 is -0.63. This feature is indeed different from the overseas REITs markets, and also contributes to the steady development of the domestic REITS market. This also shows that currently listed REITs products focus on high-quality assets in core cities and can obtain certain government subsidies in the face of the impact of the epidemic, thus avoiding risks such as unstable performance and operations of listed companies and capital expenditure. Therefore, the return and risk characteristics are different from those of stocks.

After the listing of REITs, the update frequency of the underlying asset valuation is generally annual, while the underlying real estate operation is disclosed quarterly, so the mismatch between the two frequencies will make it difficult for investors to evaluate the deviation degree of the secondary market price of REITs from the valuation according to the performance realization. Therefore, the relative valuation index P/FFO can be used as a reference to evaluate different REITs in the same industry by calculating the ratio of stock price to working capital, and then comparing their intrinsic values [12].

Taking the end of 2021 as the value time point, CCB Zhongguancun REIT's issuance scale is 2.88 billion yuan, and its operating cash flow in 2021 is about 155.797 million yuan, which is better than the predicted value, and its P/FFO is 18.48, which is at a medium-to-low level among the peers.

As of November 18, 2022, CCB Zhongguancun REIT's current market value is 3.848 billion yuan, based on the price of 4.276 yuan per unit. According to the third-quarter report, the completion rate

DOI: 10.54254/2754-1169/18/20230082

of the distributable amount in the first three quarters of CCB Zhongguancun REIT is 81.2%, which is better than the expected value of 75%. Taking 81.2% as the FFO of the first three quarters, with the FFO of the whole year 2022 of 157 million yuan, the current P/FFO valuation of CCB Zhongguancun REIT is 30.09. The valuation has increased since the end of 2021, and has basically reached the average level of the current US industrial REITs, indicating that the current valuation is already relatively high.

Table 3: FFO Predicted value[10].

	2021	2022	2023	2024	2025
+income	22,885.2	23,140.0	23,671.0	24,204.9	24,480.6
- Operating expenses, write-offs, depreciation, amortization, interest expense and general administrative expenses	13,948.3	13,644.0	13,558.0	13,263.2	13,135.1
Net income	8,936.9	9,495.9	10,113.0	10,941.6	11,345.6
-Capital gains	-	-	-	-	-
+depreciation and amortization	6,642.8	6,252.7	5,908.8	5,583.8	5,276.7
FFO	15,579.7	15,748.6	16,021.8	16,525.4	16,622.2

Table 4: Industrial REITs in the United States[13].

Name	Closing price	FFO($)		P/FFO($)		FFO growth	FFO Rate of dispatch	Total market value($M)
		2021	2022	2021	2022	2021~2022	2021Q3	
Americold Realty Trust	32.79	1.16	1.25	28.29	26.25	7.77	93.75	8,747.4
Duke Realty Corp	65.54	1.74	1.90	37.77	34.60	9.15	65.15	24,999.0
Eastgroup Properties	227.85	6.05	6.58	37.64	30.78	8.78	60.00	9,269.9
First Industrial Realty Trust	66.20	1.97	2.15	33.66	30.78	9.33	53.05	8,548.2
Industrial Logistics Properties Trust	25.05	1.88	1.93	13.36	13.00	2.75	80.49	1,635.8
INDUS Realty Trust Inc	81.06	1.41	1.54	57.48	52.54	9.40	-	824.7

Table 4: (continued).

Innovative Industrial Properties	262.91	6.38	8.75	42.21	30.01	37.30	76.09	6,290.5
Lexingten Realty Trust	15.62	0.78	0.75	20.13	22.77	-3.09	88.75	4,417.6
Monmouth REIT CIA	21.01	0.91	0.90	22.96	23.34	-1.63	44.74	2,055.3
Plymouth Industrial REIT	32.00	1.71	1.91	18.71	16.74	11.81	68.18	1,107.4
Prologis	168.36	4.66	5.09	36.14	33.09	9.23	-	124,548.2
PS Business Parks	184.17	6.95	7.42	26.50	24.81	6.79	62.87	5,070.0
Raxford Industrial Realty	81.11	1.62	1.88	50.12	43.06	16.39	53.33	12,287.1

5. Future Outlook

By the end of 2021, the scale of public REITs in the United States was about 1.6 trillion US dollars, accounting for about 7% of GDP, among which the scale of infrastructure REITs was about 520 billion US dollars, accounting for about 1/3 of the total scale of REITs and about 2.5% of GDP. According to these estimates, the market size of China's public infrastructure REITs is expected to reach 2-3 trillion yuan in the future. China's industrial parks have a large scale of assets and diversified types, and the listed industrial park infrastructure public offering REITs projects have a strong expectation of expanding insurance. According to statistics, China has more than 500 national-level development zones, nearly 2,000 provincial-level development zones, and nearly 20,000 industrial parks, with huge asset scale and vast market capacity.

"Development is important, operation is light" is a common problem in China's industrial parks. The public offering REITs platform can help the original equity holders to realize the full-cycle operation mode of "asset light + operation heavy", so that the original equity holders can focus more on the park's common technology services, the park's enterprise option services and other high value-added businesses, gradually expand their operation scale, and create a replicable operation model and service brand.

By introducing various kinds of capital, the public offering REITs of infrastructure in industrial parks can strengthen the market’s binding force, make the disclosure of infrastructure operation information more fully, provide long-term financial support for infrastructure construction, continuously enhance the investment management attributes of the public offering REITs of infrastructure in industrial parks, and gradually acquire the professional ability and market reputation for market-based mergers and acquisitions.

6. Conclusion and Shortcomings

This paper takes CCB Zhongguancun REIT as the main research object, and makes a detailed analysis of the research object from the aspects of transaction structure, underlying asset status, and future cash flows by combining the market performance of industrial park REITs with the mainstream REITs valuation methods at home and abroad. Meanwhile, the rationality of the valuation of CCB Zhongguancun REIT was studied by combining the initial pricing comparison between similar industrial park projects and the performance at different stages after listing. According to the research results, thanks to the favorable location of the underlying assets and the effect of industrial agglomeration, the operation of Zhongguancun Software Park remained stable before and after the epidemic. Despite repeated outbreaks since 2022, the park still achieved the predetermined performance target. In terms of the relative valuation level of the two time points in 2021 and 2022, it is at a higher level among similar projects, reaching the average valuation level of industrial REITs in the United States, which further confirms that the core of the investment value of public REITs lies in the underlying assets, and the subject credit is stripped away. The good market performance will help attract more high-quality underlying assets to be revitalized through public offering REITs.

Through the case study of Zhongguancun REITs, this paper aims to analyze the selection of valuation methods and the handling of relevant variables in the listing valuation and pricing process of REITs in typical industrial parks. In this process, the transaction structure of the case, the main business of the underlying assets, and all aspects of the cash flow were analyzed. But there are still some shortcomings in the analysis.

Since the case is relatively new, and the original underlying assets have a short time period since their establishment date, there are only a few audited annual data, and there are certain limitations in the understanding of the underlying assets. Therefore, there are certain errors in the valuation comparison between similar projects based on historical data and comparable situations. In this paper, when using the P/FFO model for valuation, other adjustment items in FFO are ignored, because they are not always available, such as the changes of receivable and payable items, and the future capital support reserved. Such an assumption will reduce the interference items in the valuation and pricing process, but it will also affect accuracy, especially in the future when the first few periods of FFO cash flow is more important. In view of the above deficiencies, the author will continue to make up for the above deficiencies in the study.

References

[1] *Wu Changhai. (2021). Research on Information Disclosure Responsibility Allocation System of public offering REITs. Fiscal science, 66, 60-61.*

[2] *Wang kai,Dong Dezhi. (2022). Overseas REITs development experience: Rules and lessons. International finance,2022(6), 37-38.*

[3] *Lin Hua. (2022). Chinese Public Offering REITs Operation Manual. 36-39.*

[4] *Gao Guohua. (2022). Steady Start to Ride the wind -- Review of public Offering REITs in 2021 and Outlook in 2022. Journal of Bonds, 12-14.*

[5] *Cheng Dan. (2022). Analysis of the application of REITs in industrial parks. Jiangxi University of Finance and Economics, 6, 12-15.*

[6] *Chen Qihao. (2022). Based on FFO discount method, this paper studies the REITs pricing of the underlying assets for the industrial park . Shanghai Normal University, 14-15.*

[7] *Guo Xu. (2022). Construction of cooperative operation mode of Industrial investment and industrial incubation -- A case study of Zhongguancun Software Park. Technology and industry, 22, 106-108.*

[8] *Zhang Jiahe. (2022). Valuation of public offering REITs based on income method. Zhejiang University of Finance and Economics, 12, 19-20.*

[9] *Li Tingting. (2022). Analysis on the underlying asset evaluation method of infrastructure public offering REITs. Architectural economics, 42, 106-108.*

DOI: 10.54254/2754-1169/18/20230082

[10] *CCB Fund Management Co., LTD. CCB Zhongguancun REIT Recruitment prospectus (2021). Online: http://www.sse.com.cn/reits/info/index_detail.shtml?audit_id=18465.*
[11] *Li Wenzheng. (2022). Pricing of infrastructure REITs. Chinese finance, 14, 58-59.*
[12] *He Tianxiang. (2022). Research on Valuation Optimization of infrastructure Public Offering REITs. East China Normal University, 5, 14-16.*
[13] *Data source, National Association of Real Estate Investment Trusts, Online: https://www.reit.com/data-research, website of*