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## Equity Research and Valuation of CBRE Group, Inc.

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## **ABSTRACT**

This dissertation values CBRE stock, an American commercial real estate and investment company. The company is listed in the S&P 500, a highly regarded index that comprises the largest publicly traded companies in the US.

The purpose of this valuation is to determine CBRE's fair value and make a recommendation to buy, hold, or sell based on its intrinsic value at the start of the fiscal year in 2024. Accurate explanations and appropriate justifications will be provided to support this computation.

The pandemic has significantly altered the business environment, requiring a comprehensive analysis of its effects on companies like CBRE and the broader economy. The dynamic business landscape underwent transformative shifts that potentially revolutionized the conventional work paradigm. The emergence of AI, E-commerce, and remote work presents both opportunities and challenges for established firms. This could potentially serve as the rationale for the assessment that will be presented in this document, which suggests selling the stock.

These findings will be compared to a report from Zacks Investment Research, a reputable American firm specializing in research, analysis, and recommendations on the financial markets, in order to determine if the results align.

## RESUMO

Esta dissertação avalia o preço das ações da CBRE, uma empresa americana de Real Estate comercial e de investimentos. A empresa está listada no S&P 500, um índice altamente conceituado que engloba as maiores empresas listadas publicamente nos Estados Unidos.

O objetivo desta avaliação é determinar o valor da CBRE e fazer uma recomendação de compra, manutenção ou venda com base no valor intrínseco no início do ano fiscal de 2024. Explicações precisas e justificações apropriadas serão fornecidas para apoiar esse cálculo.

A pandemia alterou significativamente o ecossistema dos negócios, exigindo por isso uma análise abrangente de seus efeitos em empresas como a CBRE e na economia em geral. O cenário dinâmico dos negócios passou por mudanças transformadoras que potencialmente revolucionaram o paradigma convencional do trabalho. O surgimento de IA, E-commerce e o trabalho remoto, apresentam tanto oportunidades quanto desafios para empresas estabelecidas. Isto pode servir como justificativa para a avaliação que será apresentada neste documento, sugerindo a venda das ações da empresa mencionada.

Estes insights serão comparados com um relatório da Zacks Investment Research, uma empresa americana respeitável e especializada em pesquisa, análise e recomendações sobre o mercado financeiro, a fim de determinar se os resultados estão alinhados.

## **ACKNOWLEDGMENTS**

Firstly, I would like to express my gratitude to Professor José Carlos Tudela Martins for his mentorship and availability in addressing every question.

Second and most importantly, I want to thank my kids, Xavier and Tomás, for giving me the courage to pursue this diploma. Despite not being aware of their influence, they are the guiding stars. This work is dedicated to them.

With equal importance, I would like to thank Lara; without her, this venture would not be possible.

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## EXECUTIVE SUMMARY

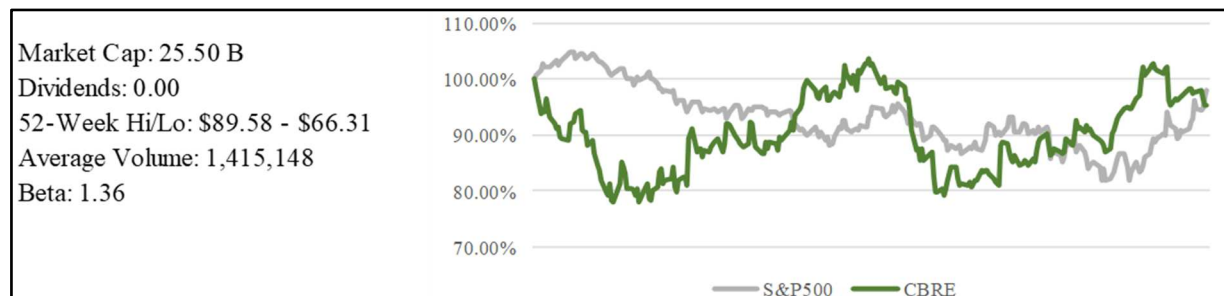
### CBRE Group Inc Class A

Industry: Real Estate	Recommendation: Sell (18.08.2023)
Primary Index: XNYS	Current Price: \$82.29
Ticker: CBRE	Price Target (2024): \$40.12
ISIN: US12504L1098	Zacks Price Target: \$70.00

### Company Profile

CBRE is the world's largest commercial real estate services and investment firm, according to 2022 revenue, offering a wide range of services to tenants, owners, lenders, investors, and others. The organization, which was founded in 1906, currently has approximately 115,000 employees as of December 31, 2022. Currently, Robert Sulentic serves as the chairman and CEO of the organization, which is headquartered in Dallas, Texas.

### Stock Performance (18.08.2022 - 18.08.2023)



The company's EPS has experienced a notable decline from \$6.06 on September 30, 2022, to \$2.64 on June 30, 2023, indicating a substantial decrease in profitability over this period.

### Summary

Based on the DCF and comparable multiples analysis, the estimated average price as of August 18, 2023, is approximately \$41.00. This indicates that the stock is being traded at a price that is higher than its inherent value. The DCF was determined utilizing WACC and a two-stage model spanning a period of 5 years. The model incorporates a short-term growth rate of 8.58% and a long-term growth rate of 2.00%.

(See Appendix XIII)

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## **LIST OF ABBREVIATIONS**

APV - Adjusted Present Value

AS - Advisory Services

BPS - Basis Points

CAGR - Compound Annual Growth Rate

CapEx - Capital Expenditures

CAPM - Capital Asset Pricing Model

CBRE - Coldwell Banker Richard Ellis

CEO - Chief Executive Officer

CFO - Chief Financial Officer

COGS - Cost of Goods Sold

COO - Chief Operating Officer

CRE - Commercial Real Estate

D&A - Depreciation and Amortization

DCF - Discounted Cash Flow

DDM - Dividend Discount Model

DPS - Dividends Per Share

EBIT - Earnings Before Interest and Taxes

EBITDA - Earnings Before Interest, Taxes, Depreciation, and Amortization

EPS - Earnings Per Share

ESG - Environmental, Social, and Governance

EV - Enterprise Value

EVA - Economic Value Added

FCF - Free Cash Flow

FCFF - Free Cash Flow to Firm

FP&A - Financial Planning and Analysis

GWS - Global Workplace Solutions

IFRS - International Financial Reporting Standards

M&A - Mergers and Acquisitions

MRP - Market Risk Premium

NOPAT - Net Operating Profit After Taxes

NOPLAP - Net Operating Profit Less Adjusted Taxes

NPV - Net Present Value

NWC - Net Working Capital

PPE - Property, Plant, and Equipment

PV - Present Value

R&D - Research and Development

REI - Real Estate Investment

ROC - Return on Capital

ROE - Return on Equity

ROIC - Return on Invested Capital

S&P500 - Standard & Poor's 500

SWOT - Strengths, Weaknesses, Opportunities, Threats

TTM - Trailing Twelve Months

TV - Terminal Value

WACC - Weighted Average Cost of Capital

YOY - Year Over Year

# 1. INTRODUCTION

The well-known book 'Valuations' by McKinsey begins by describing a historical period known as the dot-com bubble, when intrinsic valuation methods were somewhat overlooked, leading to significant mistakes by investors and other financial stakeholders. During this period, the internet boom created numerous opportunities and a new world to be explored. There was exponential growth in companies capitalizing on these opportunities. However, caught up in the euphoria, companies were often traded at high multiples, neglecting fundamental financial analysis and company performance. This speculation eventually led to a severe recession following the bubble's burst.

Investors interested in understanding an asset's underlying value for making educated investment decisions based on its true value often find the intrinsic valuation approach essential but, at the same time, more time-consuming, as it requires extensive data and assumptions, making it a complex method.

This dissertation will examine both approaches to determine whether CBRE's stock price is trading at fair value, providing hypothetical guidance for buying or selling this security.

## 2. LITERATURE REVIEW

### 2.1. Intrinsic Valuation

Fundamental analysis aims to ascertain the intrinsic value of assets by evaluating their potential future cash flows while considering their risk attributes. There is a vast array of methodologies that can be employed.

#### 2.1.1. Discounted Cash Flows model (DCF)

To employ the DCF method, it is crucial to consider three key elements: the projection of FCF, the estimation of the terminal value, and the determination of the discount rate.

#### Free Cash Flow to the Firm

FCFF serves as a vital indicator of the company's financial well-being and its capacity to create value for its stakeholders. The formula is stated as follows:

$$FCFF = NOPLAT + D\&A - Capital\ Expenditures - Changes\ in\ NWC$$

NOPLAT (Net Operating Profit Less Adjusted Taxes) represents the operational earnings.

Non-cash expenses, such as D&A, need to be added to NOPLAT because they do not involve an actual outflow of cash from the company. CapEx refers to the expenditures made on assets to increase future performance or to maintain operations and functionality.

Changes in NWC also must be deducted, which represent the capital used for the firm's day-to-day operational activities.

$$NOPLAT = EBIT (1 - t)$$

Where  $t$  is the corporate tax rate and EBIT is calculated by subtracting operational expenses from revenue.

FCFF is calculated through a forecast analysis that aims to predict the short-term future of a specific company and evaluate its performance over a period of 3, 5, or 10 years. Once the

forecast has been obtained, it is necessary to determine the terminal value of the firm as well as the discount rate, which represents the cost of capital.

NOPLAT also allows for the calculation of Return on Capital using the following formula:

$$ROC = \frac{NOPLAT}{Equity + Debt - Cash}$$

The ROC metric evaluates the extent to which a company's operations are producing value. A firm is creating value if its ROC exceeds its cost of capital. If the ROC is below the cost of capital, the firm destroys value.

### **Weighted Average Cost of Capital**

The WACC is a frequently employed metric in DCF analysis for assessing the cost of capital that serves as the discount rate. It denotes the average rate of return that both equity and debt investors anticipate. This method is widely utilized for valuing cash flows that are subject to risks and financed through a mix of equity and debt. However, applying WACC can be challenging in situations of high leverage where the capital structure is subject to change over time (Mitra, 2010).

WACC is derived by assigning weights to the cost of each capital source (debt and equity) based on its proportion in the company's capital structure. The formula for WACC is:

$$WACC = \frac{E}{E + D} \times ke + \frac{D}{E + D} \times kd \times (1 - t)$$

Where:

$E/(E+D)$  denotes the equity proportion in the company's capital structure;

$ke$  is the cost of equity;

$D/(E+D)$  denotes the debt proportion in the company's capital structure;

$kd$  is the cost of debt;

$t$  is the corporate tax rate.

The interest paid to debt holders is tax-deductible, providing a tax benefit if the company or project is financed through a combination of debt and equity (Mitra, 2010).

## Capital Structure

The selection of an optimal capital structure significantly influences a company's risk profile, cost of capital, and financial flexibility, making this decision pivotal. A company with a larger debt component in its capital structure is considered to have higher financial leverage. This scenario can enhance shareholder returns in favorable economic conditions but also escalate the risk of financial distress in instances of repayment difficulties. Alternatively, a company with a predominantly equity-based capital structure exhibits lower financial leverage but may incur a higher cost of capital, as equity investors typically seek more substantial returns.

## Cost of Equity

The cost of equity serves as a proxy for the return that investors who contribute money to the company in exchange for ownership expect. It represents the opportunity cost for investors, considering the potential inclusion of other assets with comparable risk in their portfolio.

The cost of equity is represented as  $k_e$ , and it is always higher than  $k_d$  (cost of debt). Shareholders, as residual claimants, are compensated only after ensuring that all other creditors are paid. This higher risk necessitates a higher expected return.

## CAPM

The Capital Asset Pricing Model (CAPM) is a financial model that aids in calculating the expected return on investment based on its systematic risk. It is frequently used in finance to determine the required rate of return for an investment and to estimate the cost of equity.

The model considers the risk-free rate, the expected return of the market, and the beta of the investment.

$$E(R) = R_f + \beta \times (E(R_m) - R_f)$$

Where:

$E(R)$  represents the expected return on the investment;

$R_f$  is the risk-free rate;

$\beta$  represents the beta of the investment;

$E(R_m)$  represents the expected return of the market.

Discount rates should be included in valuation calculations because predicted payoffs must be adjusted for risk and the temporal worth of money. With the use of this technique, some degree of guesswork is possible, Penman (2006) refers to the fact that specialists must be aware of the enormous impact changes in beta estimations, or the market risk premium have on the discount rate and computed value.

### **The Risk-Free Rate**

The return from government default-free bonds is used as a measure for the risk-free rate. For using CAPM, the risk-free rate is the rate that can be obtained now (at the time when the cost of equity is calculated) by purchasing risk-free government bonds, particularly those with a high credit rating that have low default risk (Fernández, 2004).

The risk-free rate is frequently used as a benchmark to estimate the expected return on other investments, and it serves as a foundation for using the CAPM. It represents the minimum return an investor would expect to receive for taking on no risk.

### **Beta**

Beta is a measure of risk and represents the sensitivity of a stock's price change when the market price changes. But Beta does not reflect all risks equally. It's important to note that beta is not the only factor to consider when assessing an investment's risk. Other factors, such as company-specific risks and industry dynamics, should also be considered.

A security's systematic risk, as measured by beta, is the sensitivity (or covariance) of its returns to movements in the economy.

Diversification can remove residual risk, often known as "diversifiable" risk. The CAPM contends that since these risks can be easily reduced through diversification, investors won't benefit from taking them on. As a result, investors' projected returns are only connected to their systematic risks, and stocks are valued based on the systematic risks of their portfolios (Rosenberg, B & Rudd, A., 1992)

Rosenberg and Rudd (1992) also suggest a compromise approach that balances the historical beta of a company with a conservative prediction of 1.0.

This approach considers two factors: the historical beta of the company and the fact that it will tend to be the average of all companies.

$$\text{Adjusted beta} = \frac{2}{3} \times \text{Raw } \beta + \frac{1}{3} \times 1.00$$

## **Market Risk Premium**

The market risk premium (MRP) is the return that investors require for taking an additional risk compared to a risk-free investment. It is compensation that they demand for bearing the risk of a volatile investment.

$$E(R_m) = R_f + MRP$$

It's important to state that the risk premium is not an universally agreed-upon value. For this reason, Welch (2008) conducted a survey to provide useful insights on MRP estimates.

It was concluded that the typical finance professor, responding to Welch's survey, estimates the long-term market risk premium to be 5% on a geometric basis and 5.8% on an arithmetic basis.

## **Cost of Debt**

The cost of debt is an important component when calculating the cost of capital associated with a company or project. This is the company's effective interest rate to its bank, bondholders, or other creditors. The risk-free rate (most commonly, associated with U.S. Treasury bonds) is normally used for this purpose and added to the credit spread of the analyzed company.

$$\text{After tax Cost of Debt} = (R_f + CS) \times (1 - t)$$

Where CS is the credit spread.

## **Terminal Value**

The terminal value represents the aggregate of all future cash flows extending beyond the forecast period, embodying the anticipated liquidation value of a company at that moment.

This component holds a pivotal role in overall valuation, often contributing over 90% to the final figure. Young, Sullivan, Nokhasteh, and Holt (1999) determined that the terminal value accounts for, on average, 94% of the total valuation when using three-year forecasts, 90% with five-year forecasts, and 79% with ten-year projections. Intriguingly, even after a decade, the terminal value continues to be a dominant factor in ascertaining market value.

Given that terminal value estimates refer to the distant future, the fundamental assumptions about a company's performance and growth are critical. Consequently, the practice of

conducting sensitivity analyses is indispensable to exploring diverse scenarios and measuring the impact of minor changes in these assumptions on the valuation.

A variety of methods exist for calculating terminal value, including the perpetuity growth model and the exit multiple method. The perpetuity growth model asserts that a company will sustain cash flows indefinitely at a steady, consistent rate beyond the forecast period. This method computes terminal value by dividing the cash flow of the first year after the forecasted period by the difference between the discount rate and the anticipated growth rate. The formula employed is:

$$TV = \frac{FCFF_{(t+1)}}{(r - g)}$$

Where,  $FCFF (t + 1)$  symbolizes the future cash flow in the first period post the terminal forecast year.

### **DCF Valuation**

The FCFF for the forecasted period must be discounted using the WACC. This discounted value is then summed with the PV of the TV. This step ensures the PV of all future cash flows is accurately accounted for in the firm's valuation. This methodology aligns with the standard valuation practice, encapsulated in the following formula:

$$Enterprise Value (EV) = \sum_{t=1}^{t=n} \frac{CF_t \text{ to Firm}}{(1 + WACC)^t}$$

To compute the Equity Value of a firm, it is essential to deconstruct the EV. This process involves reversing another formula that aggregates all the components of EV and by doing so, one can isolate and identify the Equity Value:

$$Enterprise Value (EV) = Equity Value + Value of Debt + \\ + Preferred Stock + Minority Interest - Cash and Cash Equivalents$$

By deducting debt, preferred stock, and minority interest and adding cash and cash equivalents to the EV this method effectively captures the net value accessible to the equity holders.

The following step is to divide the Equity Value by the number of outstanding shares to determine the intrinsic value per share of the company. This calculation provides investors with a tangible metric to assess the worth of an individual share relative to the market price.

$$\text{Intrinsic Value per Share} = \frac{\text{Equity Value}}{\text{Number of Outstanding Shares}}$$

### 2.1.2. Dividend Discount Model (DDM)

This method is exclusively applicable for evaluating companies that have a long-standing track record of consistently distributing dividends.

The valuation assumes a firm's value equals the present value of all expected future dividends.

$$\text{Value}_0 = \frac{DPS_1}{(1 + ke)} + \frac{DPS_2}{(1 + ke)^2} + \frac{DPS_3}{(1 + ke)^3} + \dots$$

Where  $DPS_1, DPS_2, DPS_3$  and so forth represent the dividend per share of the respective year, and  $ke$  is the cost of equity.

For stable companies using a Gordon Growth Model, this formula can be simplified:

$$\text{Intrinsic Value per Share} = \frac{DPS_1}{ke - g}$$

ROE multiplied by retention rate (plowback) yields growth.

$$g = ROE \times b$$

And:

$$b = 1 - \text{dividend payout percentage rate}$$

ROE is calculated by dividing Net Income by the Book Value of Equity. Additionally,  $g$  can be used to assess the stock price.

$$P_1 = P_0 \times (1 + g)$$

DDM also enables a simplification through a 2-stage analysis, consisting of an initial non-stable phase followed by a subsequent stable period. This assumes growth will automatically stabilize after an initial period. Still, this analysis is recommended for companies with regular dividends.

$$Value_t = \sum_{t=1}^n \frac{DPS_t}{(1 + ke, hg)^t} + \frac{DPS_{n+1}}{ke, st - g_n} \times \frac{1}{(1 + ke, hg)^n}$$

Where  $DPS_t$  is the expected dividends per share in the year t, hg is the high growth phase, while st is the stable growth phase, and  $g_n$  is the growth rate forever, after year n.

### 2.1.3. Economic Added Value (EVA)

EVA represents economic profit over a specific period and assumes that real value is created when shareholders receive returns above their required rate. If the company's net operating profit after taxes (NOPAT) exceeds the finance charge, then the company is generating value. The company destroys value if the opposite happens.

$$EVA = NOPAT - (WACC \times Invested Capital)$$

Invested Capital is equity plus long-term debt at the start of the period. The product of WACC and invested capital is also referred to as the finance or capital charge.

EVA is calculated by adjusting accounting profits and balance sheet data, making it susceptible to anomalies and analyst adjustments.

There are two common approaches to EVA valuation: forecasting annual EVAs and forecasting year-on-year EVA differences.

The first approach calculates the cumulative present value of annual EVAs over the explicit forecast period, as well as a terminal value at the end of the forecast period. Combining these factors with the company's initial invested capital yields its value.

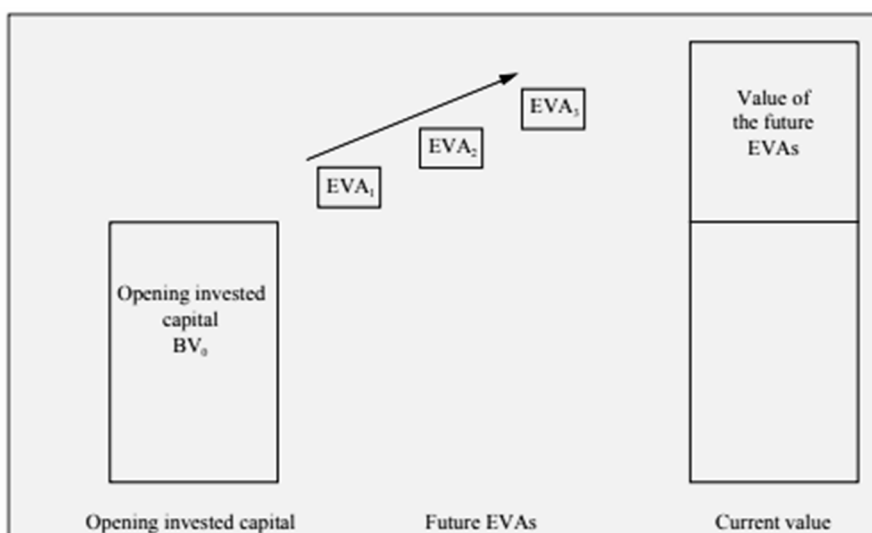


Figure 1- Illustration of the EVA valuation (Source: UBS Global Research)

The second method treats annual EVA differences as annuities. The company's value is the cumulative present value of these annuities, the last actual EVA, and invested capital. Operating profit less tax is expressed as a percentage of opening invested capital to calculate the after-tax ROIC for each forecast year. A return spread is calculated by subtracting the WACC from the ROIC and multiplying by the starting capital to calculate each year's EVA. Equity value is calculated by adding future EVAs to invested capital and subtracting debt. The stock's fair price is equity value per share.

#### 2.1.4. Adjusted Present Value (APV)

The APV method estimates firm value in two steps. Before incorporating the costs and benefits of debt financing, which are considered in the second step, the firm or project is initially valued using full-equity financing.

$$APV = PV \text{ of unlevered firm} + PV \text{ of the side effects associated with financing}$$

To determine the unlevered firm's present value, one must assume that all of its funding comes from equity and discount the unlevered cash flow at the unlevered cost of equity. To calculate the NPV of the unlevered project, the initial investment is subtracted.

$$NPV_{all \text{ equity}} = \frac{\text{Unlevered } CF_{\text{per year}}}{r_{all \text{ equity}}} - \text{initial investment}$$

When debt financing is used, the interest paid is eligible for a tax rebate. In the case of perpetual debt, the yearly interest payment remains unchanged, and the tax shield per year is determined by multiplying the debt interest rate ( $rd$ ), the debt amount ( $D$ ), and the relevant tax rate ( $t$ ). The overall APV includes this tax shield's discounted present value at  $rd$ .

$$NPV_{tax\ shield} = \frac{tax\ shield_{per\ year}}{rd} = \frac{rd \times D \times t}{rd} = D \times t$$

In addition to tax-shield benefits, debt financing may incur issue costs, bankruptcy costs, and agency costs. These side effects are considered separately.

$$APV = NPV_{all\ equity} + NPV_{tax\ shield} + PV_{other\ side\ effects}$$

APV is better than the above methods when capital and tax structures are uncertain, according to Mitra (2010). When debt levels fall year after year, the debt-to-equity ratio changes, making CCF, FTE, and WACC methods unsuitable.

### 2.1.5. Residual Income Model

The residual income model divides the intrinsic value of a stock into two components: the book value of equity and the present value of the expected future residual income.

Book value of equity is assumed to be the fair value of net assets, and if the firm is not expected to make economic profit, intrinsic value should be book value. Investors should not pay more than its book value if no economic profits are expected. However, if the company is expected to generate economic profit, the resulting increase in value should be clearly reflected in the current stock price of the company.

$$Value_0 = B_0 + \sum_{t=1}^{\infty} \frac{RI_t}{(1+r)^t}$$

For constant earnings growth, use a degenerate formula. Like other methods of valuation, the earning growth rate plays a crucial role in the process of determining the value. Also, a firm generates economic profit when its ROE exceeds the required return.

$$Value_0 = B_0 + \frac{ROE - ke}{ke - g} \times B_0$$

## 2.2. Relative methods

Relative valuation methods, like comparable multiples, figure out how much an asset is worth by comparing it to ratios from similar companies and industry standards. An often-cited example to explain this type of valuation is assessing a property's value based on the per-square-meter value of nearby houses. This method is straightforward and easily compares assets, but it may fail to capture the unique characteristics and prospects of the individual asset.

### 2.2.1. Comparable sector multiples

Multiples persist because DCF or other intrinsic methods require ROIC, growth, and FCF projections. The future is hard to predict, so financial analysts use multiples to avoid subjective forecasts (Koller, T., Goedhart, M., & Wessels, D., *Valuation: Measuring and Managing the Value of Companies*, 2010)

Multiples are only relevant when compared to peers with similar ROIC and expected growth. The results are heavily influenced by current market sentiment and the degree of comparability with the chosen companies. Furthermore, this assessment fails to consider the details of the company.

Equity multiples and EV multiples are two frequently employed types of multiples in the field of finance. After selecting the suitable multiple, it is subsequently multiplied by the corresponding metric it pertains to. For example:

$$Enterprise\ Value = EBITDA \times EV/EBITDA$$

And,

$$Equity\ Value = EBITDA \times EV/EBITDA - Net\ Debt + Cash$$

When evaluating stocks, it is essential to consider the quality of the metric being employed. For example, EBITDA can appear in different manifestations: Reported EBITDA, recurrent EBITDA or Run Rate EBITDA.

### *2.2.2. Precedent transaction multiples*

This method employs a similar approach to determine the price but relies on a smaller amount of available data. The data primarily originates from the records of previous transactions, and the multiple is inherently reflected in the price paid, which also encompasses the auction price. The concept here is to identify comparable companies to the one you are evaluating that have been acquired and utilize the implicit multiple paid for those companies to assess the value of the target company.

After gathering the data, it is necessary to construct a table to compute the paid ratios and subsequently compare them to the company in question.

### **2.3. Which methods, and why?**

For this dissertation's evaluation, we will primarily rely on intrinsic valuation based on fundamentals with a DCF analysis while using comparable multiples to establish value ranges within which the intrinsic value is expected to fall.

DCF is a detailed method that relies on cash flows and all significant business assumptions. The decision to utilize the DCF method instead of the DDM was based on the absence of dividend distribution by CBRE.

In addition, the relative analysis was restricted to comparable multiples due to the absence of reliable transaction multiple data for companies like CBRE.

## **3. INDUSTRY OVERVIEW**

### **3.1. Industry**

The commercial real estate services industry primarily focuses on properties that are specifically utilized for business or for income-generating purposes. These spaces are usually office, retail, industrial, or multifamily. These include hotels, restaurants, hospitals, and more. Based on condition, these entities can be divided into Class A, the highest quality, and Classes B and C. The latter category is considered less desirable due to factors such as age, location, and maintenance requirements.

The industry primarily focuses on providing leasing and related services to investors who prefer to allocate their investments towards such assets rather than engaging in the unpredictable nature of the stock market. Additionally, the services are also extended to tenants, typically businesses, who favor renting over purchasing and managing their own property. There are also mortgage services, project management, property management, and other services in this industry.

### **3.2. Five Forces of Porter**

The Porter's Five Forces Model is a widely recognized strategic management tool utilized to assess the competitive dynamics within an industry. Each of the five forces in the model and their strengths help strategic planners understand an industry's profit potential.

When considering the threat of newcomers, it is evident that they do not pose a significant threat within this industry. The difficulty of economies of scale gives large capacity producers like CBRE a cost advantage and makes newcomers more expensive. Market entry requires high capital and strict licensing and legal requirements, reducing the threat. On the other hand, new entrants can easily establish distribution channels, which strengthens the threat.

CBRE and others can easily switch suppliers due to the presence of standardized products and low switching costs. The suppliers' bargaining power is not negligible due to the absence of any viable substitutes for these products.

This industry is also characterized by the relatively low bargaining power of buyers. Difficulties in locating substitutes and a high degree of product differentiation diminish the bargaining power of buyers.

The emergence of remote work has led to a notable decrease in the utilization of office space, thereby augmenting the potential for substitute products. However, it should be noted that this fact solely applies to office space, and there are limited alternatives available for other forms of CRE.

Competition among incumbent firms in this industry is varied. The few competitors with large market shares may use competitive strategies to gain market leadership, increasing rivalry. Differentiated products make it hard for firms to compete for customers, reducing rivalry. However, the industry's tendency toward overproduction and high exit barriers due to significant capital and regulatory requirements intensify rivalry. Different firm strategies can lead to direct competition, which also strengthens rivalry.

### **3.3. Cyclicity**

Real Estate is inherently a cyclical industry. CRE cycles are complex and affected by interest rates, demographics, the economy, and regulation. From an investment perspective, it is crucial to possess the ability to discern and categorize each stage of the economic cycle and subsequently align properties and investment strategies accordingly.

Analogous to the broader economy, these phases can be characterized as Recovery, Expansion, Hyper Supply, and Recession.

Recovery begins after a recession or market pullback. This phase is likely to have low occupancies, low space demand, and low leasing activity. New construction may be minimal, and rental rate growth may be negative or flat. The expansion phase is characterized by an improving economic outlook. Wage growth may increase, and job growth may improve. Strong job growth may attract new residents, creating a virtuous cycle. Sometimes expansion gets out of hand. When it does, new construction and projects rush in to capitalize on the growth. Hyper-supply can occur if new projects outpace growth and there are not enough people and businesses to fill the space. Increasing demand by lowering prices is the most logical response. Real estate markets enter recession when defaults and losses cause falling rental rates, property values, job losses, foreclosures, and company failures. Generally, at this stage, property supply exceeds demand, and the economy is poor.

CBRE's strategy is to differentiate in the services it provides in order to avoid being subjected to cyclical events, and the company's success can be seen in the revenue chapter, which includes figures from the last two decades.

### **3.4. Trends**

Players in the commercial real estate market can navigate trends such as PropTech, Sustainability and ESG, Flexible Workspaces, Urbanization and Mixed-Use Developments, Data Analytics, Market Intelligence, Globalization, and Cross-Border Investments. Appendix I, II, and III provide a concise description of the potential impact that each of these trends can have on the industry.

However, it is apparent that the industry is facing a significant challenge that can be attributed to the post-Covid working environment and the prevailing macroeconomic conditions.

### **3.5. SARS-CoV2**

The COVID-19 had a significant impact on CRE. Remote working has changed office space demand, as many companies now have a permanent remote work policy, reducing the need for large offices. This has left London, Los Angeles, and New York with too many empty office spaces. Online shopping also affects retail mall demand. Mall foot traffic has dropped as consumers embrace e-commerce, leaving landlords and lenders with vacant properties. These properties may take longer to recover, putting investors at risk.

The pandemic is also affecting CRE in the financial sector. Global banks hold a large portion of CRE debt, making them vulnerable to market changes. The possibility of loan defaults and financial losses is significant, particularly due to the challenges faced by tenants in meeting their rental responsibilities. Some banks in the United States have become hesitant to refinance commercial properties out of concern for the possibility of a flight of deposits and liquidity issues.

Policymakers are confident that the work culture shift will not cause a credit crisis, but investors must adjust their expectations. Property risk premiums and returns in CRE are expected to fall. Investors must anticipate a new industry norm and adjust their strategies (Cruise, Raitano, & Jackson, 2023)

### **3.6. Macroeconomic Outlook and Geopolitical Factors**

Comprehensively examining the macroeconomic environment and its effects on CRE is crucial. Businesses are cutting costs, especially in talent and office space, as revenue expectations fall

to their lowest level since 2018. Rising interest rates and a high cost of capital are also affecting financial performance in the CRE industry. Global property sales have fallen due to tighter loan standards, fewer lenders, and higher borrowing costs.

Traditional offices are losing popularity to hybrid work models, while data centers and cell towers are growing. Quality assets outperform others in this segment.

Single-family rentals, build-to-rents, senior care, and life sciences are growing. Mortgage structures and central bank policies affect the global housing market. Multifamily rental property demand remains high despite recent interest rate hikes hurting home sales.

In the retail industry, there is a noticeable trend towards improving consumer attitudes and sustaining a consistent level of leasing activity. Industrial facilities are being built to meet demand from e-commerce and third-party logistics.

Corporate travel remains low, but leisure travel is helping the hotel industry recover.

Real estate companies are placing a high emphasis on the integration of sustainability and technology in order to maintain competitiveness and adhere to regulatory requirements. These domains have emerged as critical factors for firms to maintain a leading position in the industry (Deloitte, 2023).

The Ukraine war and Russia sanctions have also affected CRE worldwide. Geopolitical issues have disrupted supply chains and raised food, shelter, and energy prices. Inflationary pressures affect housing affordability and commercial property demand, affecting the CRE market. Nonetheless, by carefully navigating the geopolitical and economic landscape, CRE stakeholders can mitigate risks and find opportunities for success even in uncertain times (Brooks, 2022).

### **3.7. Risks, Opportunities and Industry Growth**

Companies operating in the CRE industry are confronted with a multitude of risks, including litigation, regulatory challenges, alterations in tax regulations, impairment of assets, investment risks, disturbances caused by economic and political factors, as well as fluctuations in the market. Nevertheless, CRE presents various opportunities, such as the notable success of multifamily properties, the increasing need for affordable housing and the possibility of innovative approaches, the surge in e-commerce leading to a higher demand for industrial space, the transformation of retail spaces into mixed-use properties through redevelopment, and the enhancement of office spaces to attract a talented workforce. Despite geopolitical issues and

high inflation, CRE owners and investors with strong balance sheets can use the industry's cyclical nature to grow their portfolio at a lower cost during a recession.

The global CRE industry grew consistently from 2017 to 2022. Over this time, the market has grown annually, indicating a strong industry. Overall, the CRE market grew moderately but steadily at 2.28% per year over this period.

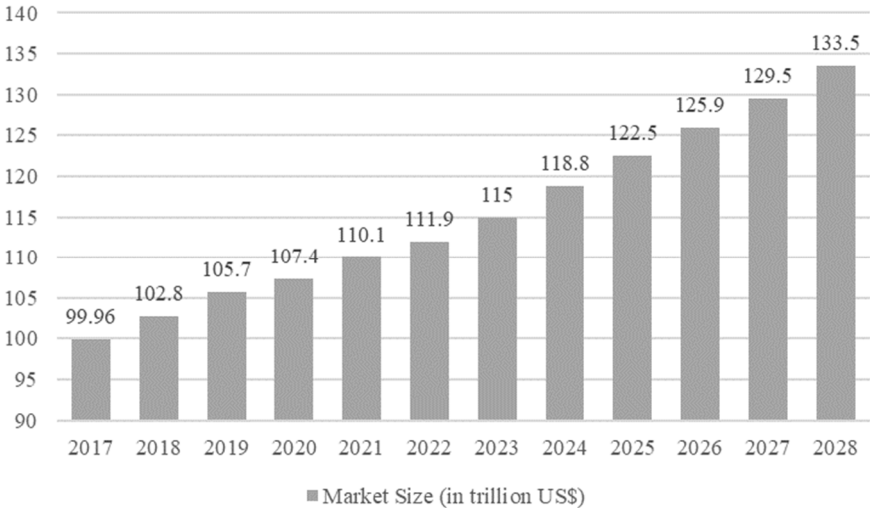


Figure 2 - CRE Market Size. Historical data and future projections (Source: Statista, 2023)

This steady growth shows the industry's ability to adapt to changing economic conditions. The average growth rate expected for 2023-2028 is about 3.03% CAGR according to this data, and suggests a balanced and sustainable growth pattern, not too rapid to raise concerns over a potential bubble nor too slow to indicate stagnation.

## 4. COMPANY OVERVIEW

### 4.1. History

CBRE Group, Inc. has a rich history that dates back to the aftermath of the 1906 San Francisco earthquake. Originally founded as Tucker, Lynch & Coldwell, it went through various transformations before becoming Coldwell Banker. In the 1960s and 1970s, the company experienced significant growth through mergers and acquisitions, expanding its services, and entering international markets. After Sears acquired Coldwell Banker in 1981, a management-led buyout group bought its commercial unit in 1989 and renamed it CB Commercial Real Estate Group. The residential arm retained the Coldwell Banker name.



*Figure 3 - Damage from the 1906 San Francisco Earthquake at the intersection of Grant Avenue and Post Street*

In 1998, CB Commercial acquired Richard Ellis International Limited, marking a substantial global expansion and leading to the company's renaming as CB Richard Ellis (CBRE). CBRE went public in 2004 and joined the Fortune 1000 and S&P 500 in 2005 and 2006, respectively. The acquisition of Trammell Crow Company in 2006 created a large real estate services entity. CBRE became a market leader in real estate investment management after acquiring a portion of ING Group, N.V.'s business in 2011. In 2015, CBRE formed Global Workplace Solutions through a merger. The company reorganized into three segments in 2019, Advisory Services, Global Workplace Solutions, and Real Estate Investments. CBRE has continued to strengthen its position through acquisitions and investments, including acquiring a majority stake in Turner & Townsend in 2021. As of 2022, CBRE is ranked 126th on the Fortune 500 and remains a leader in the CRE services industry (CBRE, Culture & History, 2023)

## **4.2. Business Model and Segments**

CBRE's core value proposition lies in its comprehensive suite of commercial real estate services. Its key competencies include brokerage services, global corporate services, property and facility management, investment management, valuation and advisory services, and development services, organized into business segments.

**Advisory Services:** This segment includes property leasing, capital markets, property management, and valuation, offering strategic real estate solutions.

**Global Workplace Solutions:** It concentrates on integrated facilities management, project management, and consulting services for real estate occupiers.

**Real Estate Investments:** This entails investment management and development services, catering to institutional investors and real estate developers.

The company caters to a diverse range of customer segments, including property owners, investors, tenants, corporate clients, developers, and lenders. CBRE utilizes various channels to reach and serve its customers, including direct sales, online platforms, strategic partnerships, and its global network of offices. Customer relationships are fostered through personalized service, customer support, thought leadership, and client events and networking.

It generates revenue through various sources, including commissions and fees, management and advisory fees, and development services. Cost structure, on the other hand, comprises a variety of elements, including employee compensation, office and operational expenses, and expenses associated with acquisitions and integration.

Strategic assets encompass various elements, such as human capital, intellectual property, a well-established brand, and a comprehensive international network. The organization forms strategic alliances with technology providers, industry associations, academic institutions, real estate developers, and financial institutions.

## **4.3. SWOT**

The detailed SWOT analysis that assesses CBRE's strategic position can be observed in the Appendix IV. In an industry with fierce competition and rapid innovation, CBRE faces many challenges and opportunities. The organization's internal strengths and weaknesses and external business opportunities and threats will be examined in this analysis. This evaluation aims to create a holistic view of CBRE's market position and future direction.

CBRE's global network, diverse integrated services, and strong financial position make it a strong real estate player. Strategic acquisitions and global construction industry growth present promising opportunities, but CBRE must remain vigilant against regulatory changes across markets. Balancing these dynamics will be key to maintaining and enhancing its market position.

#### **4.4. Management**

A key element of an organization is its management team. Successful companies rely on managers who can effectively communicate value creation, align shareholders' interests, engage in capital participation, and exhibit a long-term perspective.

Robert Sulentic is the Chair and CEO of CBRE Group, Inc. He has been in this position since December 2012 and was appointed Board Chair in November 2023. Sulentic has played a crucial role in making CBRE the world's largest CRE services and investment firm, with \$30.8 billion in 2022 revenues. Over the years, Sulentic rose through the ranks and held various leadership roles before becoming President and CEO in October 2000. He also served as Chairman of the Board in April 2002. Prior to his current role, Sulentic was the President overseeing all business segments and served as the company's CFO in 2009.

Emma Giamartino is the CFO of CBRE, responsible for overseeing the company's global finance organization. She then held notable roles in the technology, media, and telecommunications group at Nomura before becoming Verizon Communications' Director of Corporate Development. In February 2018, Giamartino joined CBRE to lead Americas M&A. She served as Chief Investment Officer and Global Head of Corporate Development before becoming CFO.

Vikram Kohli is the COO of CBRE, appointed in April 2023. He works closely with CBRE's global CEO, CFO, and business segment CEOs on strategic initiatives, growth, margin targets, and talent development. He has been with CBRE since 2001 and has held various leadership roles, including CEO of CBRE Platform, Global Group President of Business Intelligence, and leader of FP&A, Business Finance, and the FIO.

## 4.5. Shareholders

CBRE has many distinguished shareholders. These influential stakeholders exert a substantial influence on the long-term performance of CBRE as well as its corporate governance and decision-making procedures.

Holder	% Out	Shares
Vanguard Group Inc	15.98%	48,698,380
Blackrock Inc.	9.07%	27,641,774
Harris Associates L.P.	5.03%	15,321,916
State Street Corporation	4.29%	13,084,297
FMR, LLC	3.11%	9,465,982
Generation Investment Management I	2.58%	7,864,292
Geode Capital Management, LLC	2.39%	7,275,305
Invesco Ltd.	2.32%	7,083,778
Principal Financial Group, Inc.	2.24%	6,820,818
Allspring Global Investments Holdings	1.91%	5,824,186

*Table 1 - Top 10 Shareholders*

The ownership of the majority of outstanding CBRE Group Class shares is attributed to other institutional entities.

## 4.6. Market Players and Competition

The CRE services industry is fragmented and competitive, with some regions or service areas stronger than others.

In their annual report, CBRE defines a peer group to compare stock performance to industry peers and S&P 500. This group comprises eight companies: Jones Lang LaSalle Incorporated (JLL), Colliers International Group Inc. (CIGI), Cushman & Wakefield plc (CWK), ISS A/S (ISS), Marcus & Millichap, Inc. (MMI), Newmark Group Inc. (NMRK), Savills plc (SVS.L), and Walker & Dunlop, Inc. (WD).

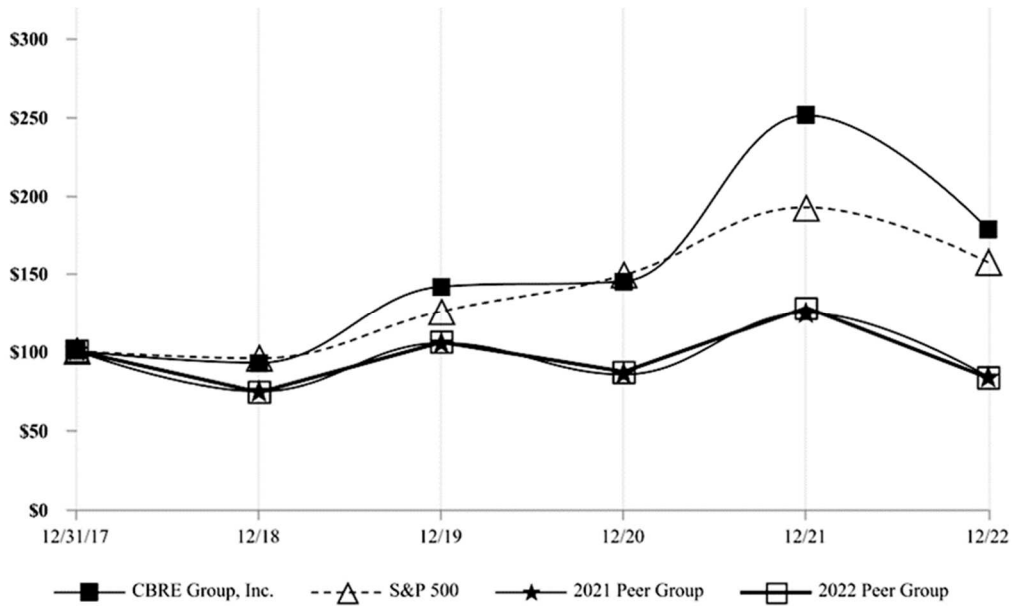


Figure 4 - 100\$ invested in CBRE vs. Peers vs. S&P500

From 2021 to 2022, Sodexo S.A. (EXHO.PA) was excluded from this peer group. Facilities management's small role in Sodexo's services prompted this decision. The figure 5 tracks CBRE common stock, S&P 500 index, and the peer group from December 31, 2017, to December 31, 2022, assuming \$100 investment value (including dividend reinvestment). CBRE beats both, but that does not guarantee future performance.

Despite being the largest CRE services firm by 2022 revenue, CBRE faces diverse competition across geographic markets, property types, and services. This competition comes from global, national, regional, and local CRE service providers like those above and market-specific firms like Eastdil Secured and others. Additionally, CBRE contends with firms in outsourcing, project management, and flexible office-space solutions, including ISS, Sodexo S.A., Arcadis, AECOM, WeWork, and IWG/Regus/Spaces, alongside Industrious, in which it holds a non-controlling interest.

## 5. COMPANY VALUATION

### 5.1. Relative Valuation

#### 5.1.1. Peer Group

When comparing CBRE to the peers listed in the previous chapter, it is imperative to acknowledge that companies with divergent growth rate and profitability, should not be regarded as comparable peers for the purpose of calculating financial multiples.

Figure 6 displays the growth of companies in relation to their respective base revenue in 2018. Looking at growth by examining this chart, it is evident that CBRE is growing at a steady rate, without the fluctuations observed in companies like MMI, and even at a higher rate when compared to the big players like Savills and JLL.

Based on a geometric average, peers were selected from this analysis that adhered to the principle of CAGR ranging from 5% to 10% (see Appendix XI). The selected companies are JLL, SVS.L, CWK, and NMRK.

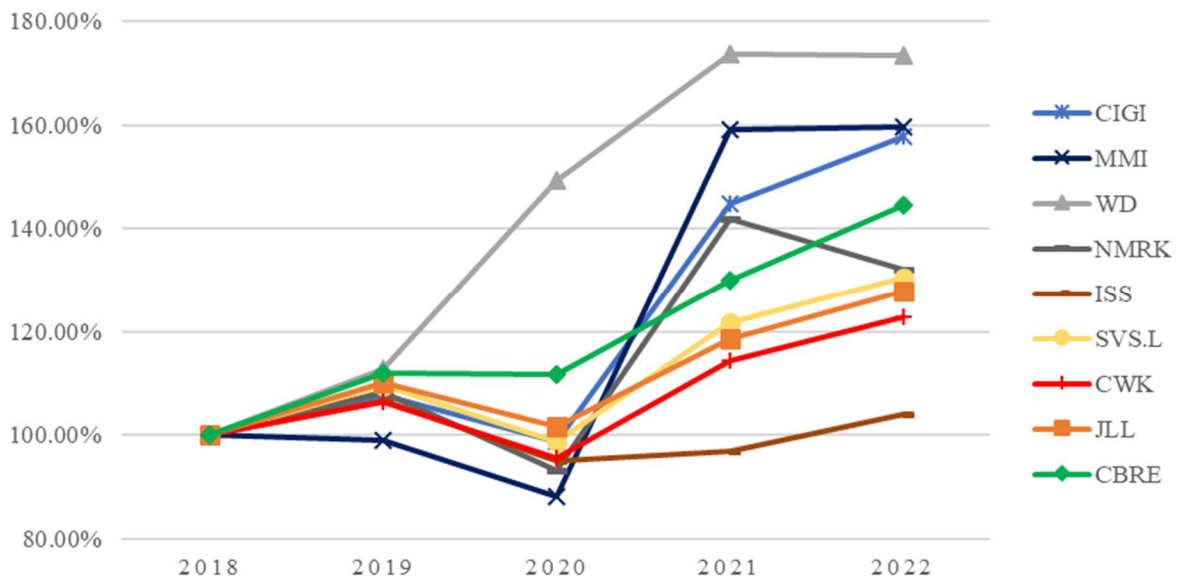


Figure 5 - CBRE vs Peers (Revenue growth)

CBRE is only outpaced in terms of growth rate by smaller-scale firms such as CIGI, MMI, and WD, which in total account for a maximum of 15% of CBRE's total volume in terms of revenue.

When analyzing profitability to filter peers, a lower operating expense ratio may indicate a competitive advantage in terms of cost management. Given the diversity in the accounting cost structures of CBRE’s peers, and the inability to specifically analyze operating expenses individually among these peers, we have opted to analyze the data by summing the Cost of Revenue and Operating Expenses. In this approach, the impact of D&A is not considered for the analysis of the operating margin.

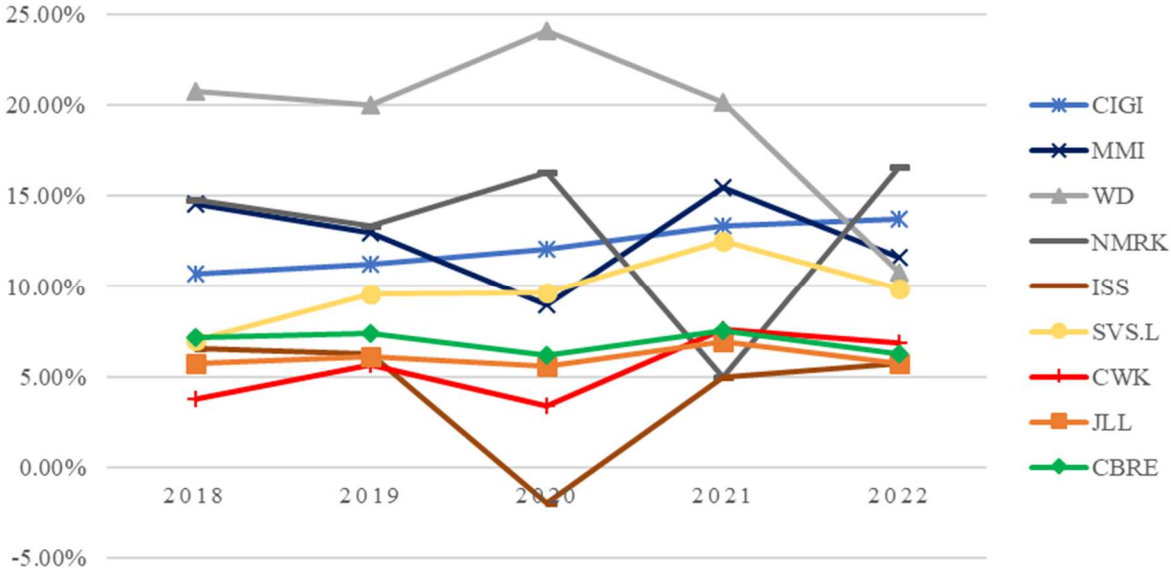


Figure 6 - CBRE vs. Peers (Operating Margin)

The chart demonstrates that smaller companies such as NMRK, WD, CIGI, and MMI achieve higher levels of operational profitability. On the other hand, JLL, SVS.L, and CWK have lower profit margins but present greater stability, with operating margins ranging from 5.45% to 9.71%. Regarding profitability, the criterion specified an average profitability range of 5% to 10%. NMRK exhibited a higher margin, exceeding the average of 10%, which led to its removal from the previously established peer group (see Appendix XI).

Also, for calculating P/E multiples, it is important to differentiate companies that have distinctive capital structures. An analysis was conducted considering the capital structures, specifically excluding firms with a debt/(debt+equity) ratio exceeding 45%.

Companies	Ticket	Market Data							
		Share Price	Shares Outstanding	Equity Value	Net Debt	Capital Structure	Cash & Equivalents	Minority Interest	Enterprise Value
(\$ in millions), Numbers have been rounded for presentation purposes. Totals may not add due to rounding.									
Jones Lang LaSalle Incorporated	JLL	163.18	48.0	7,835.9	4,206.0	34.93%	402.5	127.3	11,766.7
Cushman & Wakefield plc	CWK	9.01	227.1	2,045.7	3,588.1	63.69%	502.3	600.0	5,731.5
Savills plc	SVS.L	1.05	1,416.0	1,485.5	687.8	31.65%	535.7	42.0	1,679.6

Table 2 - Peer Groups and their associated market data

The table provided above illustrates the refined peer group, wherein CWK have been excluded from P/E multiples due to their significantly distinct capital structures. This refined peer group will be employed for the computation of financial comparable multiples.

### 5.1.2. Comparable Multiples

To calculate the multiples, the indirect approach was used to determine the Enterprise Value (EV) for each company in the peer group. The formula applied was:

$$\text{Enterprise Value (EV)} = \text{Market Capitalization} + \text{Value of Debt} + \text{Preferred Stock} + \text{Minority Interest} - \text{Cash and Cash Equivalents}$$

Two EV-based multiples (EV/Sales and EV/EBITDA) and the P/E ratio were chosen due to their relevance and applicability to the sector and maturity of the companies. These multiples offer a comprehensive view of a company's value in relation to its sales, EBITDA, and Net Income respectively, providing a balanced perspective on valuation.

Companies	Ticket	Financials			Valuation		
		Revenue	EBITDA	Net Income	EV/Sales	EV/EBITDA	P/E
(\$ in millions), Numbers have been rounded for presentation purposes. Totals may not add due to rounding.							
CBRE Group, Inc.	CBRE	30,855.0	1,543.4	846.0			
Jones Lang LaSalle Incorporated	JLL	20,550.3	966.9	308.3	0.57x	12.17x	25.42x
Cushman & Wakefield plc	CWK	9,817.4	547.6	(17.6)	0.58x	10.47x	-
Savills plc	SVS.L	2,724.7	322.0	164.0	0.62x	5.22x	9.06x

Table 3 - Multiples Valuation

After this, the statistical median of these multiples was established and applied to CBRE's respective financial data.

	EV/Sales	EV/EBITDA	P/E
High	0.62x	12.17x	25.42x
75th Percentile	0.60x	11.32x	21.33x
Average	0.59x	9.28x	17.24x
Median	0.58x	10.47x	17.24x
25th Percentile	0.58x	7.84x	13.15x
Low	0.57x	5.22x	9.06x

*Table 4 - Applicable Multiples*

The EV/Sales multiple suggests a valuation of \$41.69, the EV/EBITDA multiple indicates a valuation of \$35.77, and the P/E ratio points to a valuation of \$46.40. The figures are based on a small peer group of three, as presented earlier.

CBRE Group, Inc. Valuation	EV/Sales	EV/EBITDA	P/E
Implied Enterprise Value	18,013.5	16,154.2	19,494.7
Cash & Equivalents	1,261.2	1,261.2	1,261.2
Net Debt	5,376.6	5,376.6	5,376.6
Minority Interest	795.6	795.6	795.6
Implied Market Value	13,102.5	11,243.2	14,583.7
Shares Outstanding	314.3	314.3	314.3
<b>Implied Share Price, \$</b>	<b>41.69</b>	<b>35.77</b>	<b>46.40</b>

*Table 5 - Multiple Valuation results*

Relative valuations dominate Wall Street valuations. However, their effectiveness is contingent upon the specific peer group that is chosen. Despite its relative nature, this method constitutes an essential initial stage in the construction of a robust framework for valuation.

## **5.2. Discounted Cash Flow valuation**

The strategic framework for this DCF analysis consists of segment-wise and consolidated evaluations. Revenue, EBIT, D&A, and other relevant financial metrics across distinct business segments are dissected in the segment-wise business analysis spanning 2019-2022. This analysis, which uses data from 2019 to 2022, provides an in-depth understanding of each segment's financial performance and evolving trends.

Since not all data was segment-wise available, a consolidated data analysis spanning 2017–2022 had to be used. Financial elements that are not limited to individual segments, such as CapEx and NWC, are viewed holistically, using a slightly longer period of historical data, spanning 2017 to 2022 (See Appendix V, VI, VII and VIII).

All analyses use the latest data, as of August 18, 2023, to ensure relevance and accuracy across the financial landscape.

### 5.2.1. Revenue

Companies with a sales history are easier to assess for future revenue than start-ups but the post-pandemic economy, on the other hand, presents uncertainty. Under such circumstances, past data from CBRE serves as a foundation for the assumptions that are required to project the future.

CBRE has achieved an impressive 20-year revenue growth rate of CAGR 16.73%, with key milestones including the acquisition of GWS in the end of 2015, which resulted in a significant revenue increase (60% growth in the following year). In contrast, the 2008-2009 financial crisis and the 2020 pandemic posed challenges, highlighting the company's strategic need to focus on resilient, anti-cyclical market segments.

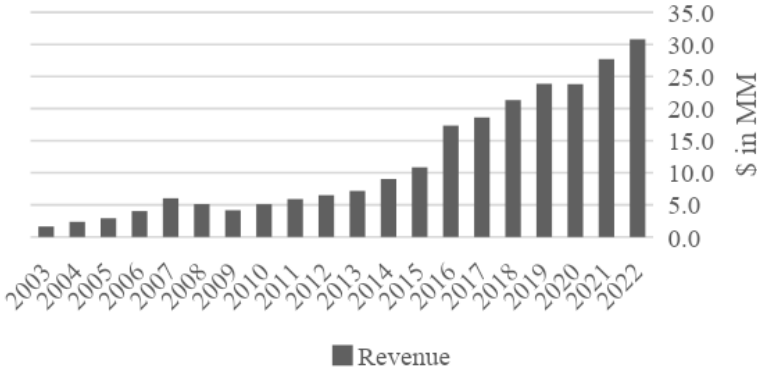


Figure 7 - 20-year revenue history (2003-2022)

Figure 8 shows an upward growth trajectory over the past 20 years. However, Figure 9 shows that growth has slowed in recent years and contracted in recent quarters. These trends are anticipated to impact the 2023-onward estimates, possibly reflecting the effects of the pandemic and rising interest rates that may have begun to slow fractions of the economy. This impact varies across different segments.

Figure 9 further demonstrates CBRE's successful strategy in mitigating cyclical events, as evidenced by the comparison between the Great Recession of 2008-2009 and the recession caused by the pandemic. Although the US GDP experienced a more significant decline during

the pandemic compared to the 2008-2009 financial crisis, CBRE's revenue remained constant in 2020, in contrast to the contraction experienced during the previous crisis. This suggests that despite the dissimilar characteristics of those crises, the company's expansion into non-cyclical sectors has yielded a more consistent stream of revenue.

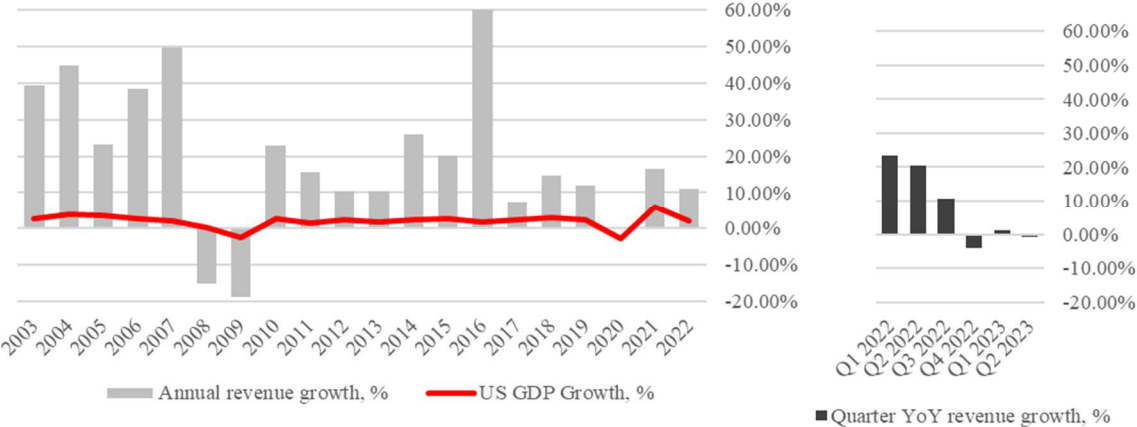


Figure 8 - Revenue growth by year (left), by quarter YoY (right)

As outlined in Chapter Five, CBRE divides its operations into three primary segments: AS, GWS, and REI. Additionally, in its annual report, it further categorizes data into two other segments: Corporate and Eliminations (C&E), and Others. A breakdown of the revenue by segment from 2019 to 2022 is represented in Figure 10.

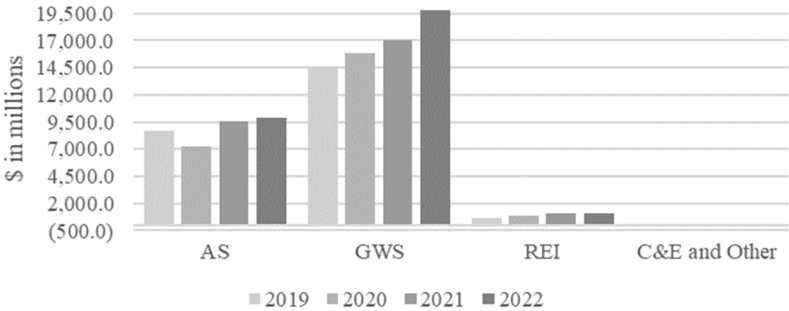


Figure 9 - Revenue by Segment (2019-2022)

The C&E segment primarily includes corporate overhead costs, such as executive officers' compensation and certain central functions. The Others segment comprises activities from strategic non-core, non-controlling equity investments.

The fluctuating economies of various countries may influence these results. Hence, in terms of revenue concentration, CBRE's revenue is broadly diversified across a wide customer base in multiple countries, suggesting minimal dependence on a small number of significant clients. Conversely, the US market constitutes a substantial portion of the revenue, indicating a certain level of dependence on this economy. This distribution is illustrated in Figure 11.

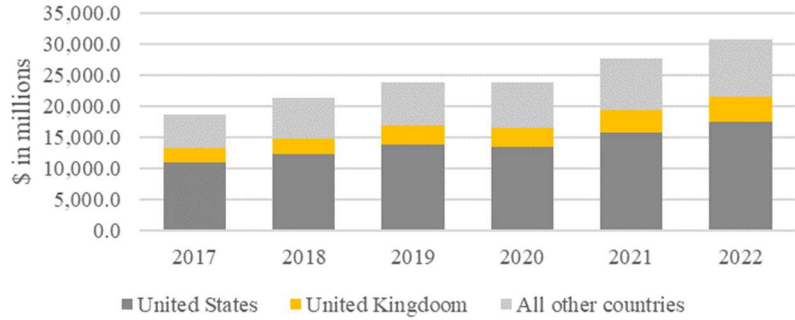


Figure 10 - Revenue by Country

To predict future outcomes, however, this information is insufficient; further analysis of the numbers is required.

Firstly, a comprehensive analysis of 2017–2022 was undertaken, capturing the pre- and post-COVID effects and normalizing the data to establish a reasonable growth rate that mitigates the crisis's impact. This period is also critical as it follows the major acquisition of GWS, significantly shaping today's CBRE, as illustrated in Figure 8.

The geometric average growth rate from 2017 to 2022 yielded a CAGR of 10.60%.

Second, since annual reports since 2019 include detailed segment-wise data, this segmentation was considered more insightful for predicting future trends.

By examining segment revenue growth separately and aggregating annual results, a more nuanced view emerges. This approach incorporates quarterly data up to 2Q of 2023, facilitating a deeper understanding of seasonality in CBRE's operations.

CBRE is sensitive to seasonality, with lower first-quarter earnings and higher fourth-quarter earnings. Yet, the recent leap in interest rates to counter inflation and resulting economic uncertainties may have altered these historical patterns for the present year. These economic conditions influence the timing and volume of real estate transactions, thereby impacting CBRE's quarterly revenue.

The forecasting methodology that was ultimately adopted involves conducting a comprehensive analysis of the YoY quarterly growth rates spanning from 2019 to 2022. Each

of CBRE's segments was analyzed using this comprehensive approach to understand their performance. Consequently, the cumulative sum of all individual segments comprises CBRE's overall revenue for the specified forecasted year, which is outlined as follows.

For example, the AS segment recorded revenue of \$1.7444 billion in the first quarter of 2019, which increased to \$1.8539 billion in the first quarter of 2023. If the geometric average is computed for these two numbers, it will reveal average growth, enabling us to infer the average growth rate at which revenues will increase in homologous periods.

$$g_{Q1} = \frac{1.7444}{1.8539}^{\left(\frac{1}{4}\right)} - 1 = 1.53\%$$

It can be deduced from these figures that CBRE, on average, experienced a YoY growth of 1.53% during the specified period of the first quarter. Subsequently, this methodology was implemented across all quarters.

Average growth rate (YoY by Quarter)				
Q1	Q2	Q3	Q4	
1.53%	-0.51%	4.48%	-0.99%	

Table 6 - Average Growth rate for the AS segment

Given the historical growth rate of the AS segment, it is now possible to make predictions regarding future growth based on these assumptions for this same segment. As an illustration, it is anticipated that the revenue for the first quarter of 2024 will amount to 1.8823 billion dollars.

$$Revenue_{2024Q1} = 1.8539 \times 1.53\% = 1.8823 \text{ billion dollars.}$$

This procedure was replicated across all subsequent time periods and segments, resulting in the projected revenue for 2023 and the subsequent period of 2024-2028.

Based on this analysis, the projected total revenue for the end of 2023 is estimated to be approximately \$31.92 billion, indicating an increase of about 3.55% from 2022.

	2019	2020	2021	2022	2023E
(\$ in millions), Numbers have been rounded for presentation purposes. Totals may not add due to rounding.					
CBRE SEGMENT TOTAL					
AS Revenue	8,654.5	7,214.7	9,575.8	9,883.5	9,025.8
GWS Revenue	14,601.9	15,808.0	17,098.9	19,851.2	21,802.0
REI Revenue	660.7	831.5	1,091.7	1,109.6	1,111.1
C&E Revenue	(23.0)	(28.0)	(20.4)	(16.0)	(16.5)
OTHER Revenue	0.0	0.0	0.0	0.0	0.0
TOTAL Revenue	23,894.1	23,826.2	27,746.0	30,828.3	31,922.5

Table 7 - Forecast for the year ending 2023

Over the next five years, CBRE is expected to grow 8.58% from 2024 to 2028. This estimate is marginally lower than the figure of 10.60% derived from the comprehensive examination of past consolidated data. This prudent estimation considers the possibility of challenging economic circumstances in the forthcoming years.

	2023E	2024E	2025E	2026E	2027E	2028E
(\$ in millions), Numbers have been rounded for presentation purposes. Totals may not add due to rounding.						
CBRE SEGMENT TOTAL						
AS Revenue	9,025.8	9,141.4	9,258.4	9,377.0	9,497.1	9,618.7
GWS Revenue	21,802.0	24,132.4	26,711.9	29,567.0	32,727.4	36,225.6
REI Revenue	1,111.1	1,290.6	1,499.1	1,741.2	2,022.4	2,349.1
C&E Revenue	(16.5)	(16.5)	(16.6)	(16.6)	(16.6)	(16.7)
OTHER Revenue	0.0	0.0	0.0	0.0	0.0	1.0
TOTAL Revenue	31,922.5	34,547.8	37,452.8	40,668.6	44,230.3	48,177.7

Table 8 - Forecast for the short-term period 2024-2028

Despite being conservative, the projected CAGR of 8.58% exceeds industry growth. This positive outlook is rooted in CBRE's historical track record of surpassing industry growth trends. The company has consistently proven its ability to expand its revenue streams at a rate exceeding the overall industry average. To verify that, revenue quality was examined to determine if growth was organic or M&A. In Appendix X, the results indicate that organic growth has consistently ranged from 7.6% to 9.8% in the recent past, while acquisitions have accounted for approximately 1.6% to 7.8%. This is regarded as evidence of CBRE's capability. Several analyses were conducted and compared to validate the previous forecasting growth rate and to reduce the risk of relying on one (Appendix IX).

Despite the competitive landscape, CBRE maintains a stable and relatively superior growth trajectory compared to its peers. As the largest revenue-generating firm in its category, it is evident that the firm has competitive advantages.

5.2.2. Cost of Revenue

The cost of revenue, which includes the direct costs of providing and producing services, is a key indicator of a company's financial dynamics. For businesses like CBRE these costs primarily consist of employee compensation, subcontractor charges, and project-specific expenses. Nonetheless, each business segment within CBRE reflects a unique cost composition, indicative of the diverse factors that drive revenue generation across these segments.

When looking at the gross margin, a significant variation is observed since 2017. Gross margin is calculated by subtracting the Cost of Goods Sold (COGS) or Cost of Revenue, from total revenue and then dividing the result by total revenue. This indicator represents the company's ability to generate profit from its operations without considering fixed costs.



Figure 11 - Gross Margin and Revenue

An increase in the cost of revenues, as a percentage of total revenue, results in a decrease in gross profit. Over the last two years (2022 and 2023), this has occurred, mainly due to an increase in employee compensation.

In terms of trends, it is also observed that the mix of segments has contributed to this variation. For instance, an increase in the GWS segment, which has a lower margin, ends up being more significant in terms of revenue weight than in other segments, thereby affecting the overall percentage. Thus, the dynamics between the different business segments of the company significantly impact the overall gross margin.

5.2.3. Operating Expenses

The relationship between operating expenses and revenue is an important indicator of a company's profitability and operational efficiency. A comparative analysis of the growth rates

of operating expenses and revenue reveals insights into CBRE's cost management effectiveness and operational scalability. If operating expenses are growing at a faster rate than revenue, it may indicate cost inflation or operational inefficiencies. Conversely, if operating expenses are growing at a slower rate than revenue, it suggests effective cost management and scalability.



Figure 12 - Revenue vs. Operating Expenses

Based on Figure 15, CBRE has been relatively balanced over the past few years. In some years, revenue growth has exceeded operating expense growth, while in other years, the opposite has happened. It is also feasible to confirm that, in certain years when revenue declined, operating expenses decreased even further. On the other hand, operating expenses exceeded revenue growth even in instances where revenue growth was higher. This suggests that CBRE can manage its costs when revenue declines, even though it may also point to some challenges in scaling the business even further. In this particular case, it is plausible to hypothesize that the increase in operating expenses subsequent to 2020 can primarily be attributed to inflationary factors. Figure 16 shows a major rise in inflation after 2020.

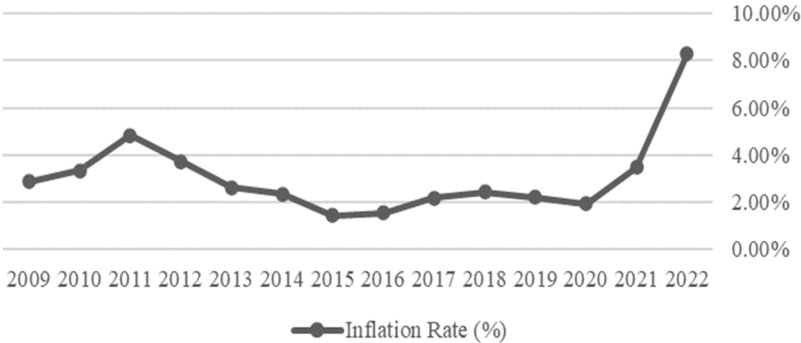


Figure 13 - Inflation rate, worldwide (Source: Macrotrends)

The headcount of CBRE exhibits a consistent upward trend, with a notable increase observed from 2021 to 2022, amounting to a growth rate of 9.52%. This figure represents a relatively lower value in comparison to the growth in 2022 revenue, which amounts to approximately 11.10%.

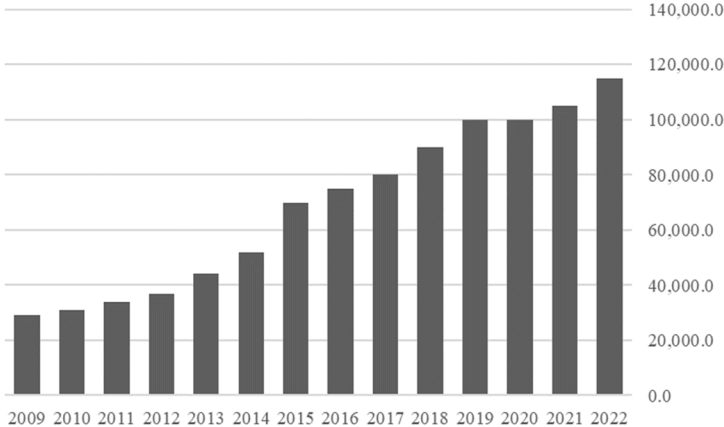


Figure 14 - CBRE Headcount Evolution

It is important to acknowledge that the anticipated revenue figures for the year 2023 are relatively low, which is likely to lead to a decrease in operational profitability for the ongoing fiscal year.

#### 5.2.4. Measuring Earnings

In terms of Net Income, which accounts for the results after taxes as reported in the annual reports, the figures for the last 10 years have consistently hovered between 5% and 10% annually. Over the last 20 years, the only instance of NI falling below zero was in 2008, a year marked by a significant global crisis in the real estate sector. It is also observed that there was a slight decrease in margin starting in 2016, a year that coincides with the acquisition of GWS. As GWS is a business with lower margins but a substantial weight on the total revenue, its inclusion proved to be significant when integrated into the overall total.

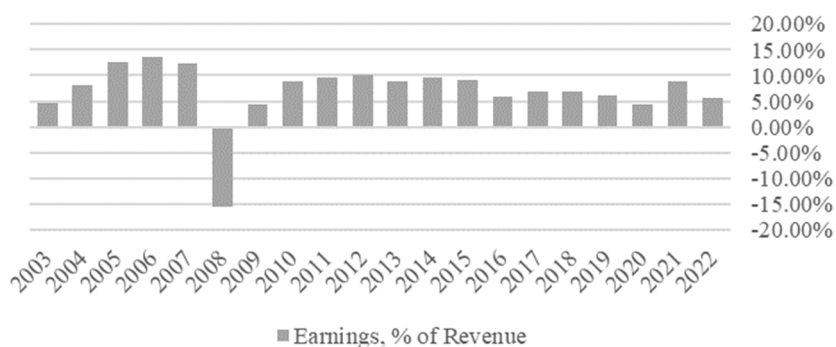


Figure 15 - Profit margin after Taxes

When valuing a company, it is important to consider not only the terminal profits but also the FCF generated by its operations. Again, the forecast was conducted individually for each segment, meaning each segment's estimated profitability for 2023–2028 will differ, with these components then aggregated to compute the total value for CBRE.

2019      2020      2021      2022      2023E

(\$ in millions), Numbers have been rounded for presentation purposes. Totals may not add due to rounding.

	2019	2020	2021	2022	2023E
CBRE SEGMENT TOTAL					
AS EBIT	1,412.0	920.1	1,735.9	1,526.9	1,179.3
GWS EBIT	309.4	346.3	499.7	569.9	571.3
REI EBIT	(109.2)	70.8	(110.2)	(115.0)	(66.3)
C&E EBIT	(352.3)	(367.4)	(463.1)	(468.8)	(442.3)
OTHER EBIT	0.0	0.0	(24.8)	(1.1)	(6.3)
TOTAL EBIT	1,259.9	969.8	1,637.5	1,511.9	1,235.6

Table 9 - EBIT by segment

Post-analysis, CBRE's EBIT for the period from 2019 to 2022 was approximately 5.06%, but a decline to 4.24% is anticipated for the future. This projection is due to notable declines in performance observed in the first two quarters of 2023 across multiple sectors, which are anticipated to persist and impact future performance. This assumption suggests that there will be an observed increase in the OPEX by approximately 107 basis points. Consequently, the proportion of OPEX in relation to revenue is expected to rise from an average of 93.01% for the period 2019-2022 to 94.08% for the forecasted period. This increase will not be entirely transferred to the selling price during the projected period.

In order to compute NOPLAT, it is necessary to subtract the tax expenses from operating income. The annual report already includes the percentage values, eliminating the need for any additional adjustments or calculations for the historical period.

	2017	2018	2019	2020	2021	2022
(\$ in millions), Numbers have been rounded for presentation purposes. Totals may not add due to rounding.						
EBIT	1,266.4	1,314.0	1,259.8	969.8	1,637.5	1,511.9
Tax Rate, %	40.16%	22.74%	5.20%	22.10%	23.60%	14.10%
NOPLAT	757.9	1,015.2	1,194.3	755.5	1,251.1	1,298.7

Table 10 - NOPLAT 2017-2022

Considering this, the subsequent table has been meticulously computed to encapsulate the relevant data:

	2017	2018	2019	2020	2021	2022	Average
(\$ in millions), Numbers have been rounded for presentation purposes. Totals may not add due to rounding.							
NOPLAT	757.9	1,015.2	1,194.3	755.5	1,251.1	1,298.7	
ROC (NOPLAT/(BVequity+BVdebt - Cash))	10.2%	11.9%	12.9%	8.1%	11.2%	12.0%	11.1%
ROE (NI/BVequity)	16.9%	21.3%	20.6%	10.6%	19.7%	16.5%	17.6%

Table 11 - ROC and ROE

ROC shows some fluctuation but remains predominantly in the double digits, indicating that CBRE is efficient in managing its capital and generating earnings. A significant drop was observed in 2020 in both ROC and ROE, attributed to the challenges posed by COVID-19. However, there was a recovery in the following years, maintaining an average of 11.1%, suggesting that, in the long term, the company is likely to consistently generate returns.

When examining the ROE, similar conclusions can be drawn. Despite the fluctuations, the post-COVID recovery is apparent, and the average is robust at 17.6% and shareholders can expect a strong return on their investment.

### 5.2.5. Depreciation and Amortization (D&A)

CBRE has reported AS, AWS, REI, Corporate, and Other D&A values since 2009.

Before 2019, operating leases had to be converted into capital leases by recognizing them as assets and liabilities on the balance sheet. IFRS 16 eliminates the need to adjust and capitalize them. This adjustment better shows the company's financial obligations.

The assets subject to depreciation and amortization range from tangible assets like property and equipment to intangible assets like software. The report states that property and equipment are treated as straight-line over 10 years, while other tangible real estate assets are treated with different periods over 15 to 39 years. For other assets, the report does not specify but uses

present value, depreciated replacement cost, market values, and selling prices less costs to dispose.

As a non-cash expense, depreciation lowers earnings without affecting cash flow.

By computing an average of D&A recorded in each segment relative to the recorded Revenue, it was possible to identify a trend in these values for the future based on historical data recorded from 2019 to 2022. Therefore, the forthcoming tables will present the projected depreciation forecast, which will be computed based on the anticipated figures from CapEx. To accomplish this, we must examine the D&A in relation to the values of Property, Plant, and Equipment, and calculate the historical depreciation rate of CBRE using the formula below:

$$D\&A\ rate = \frac{D\&A}{PPE}$$

(\$ in millions), Numbers have been rounded for presentation purposes. Totals may not add due to rounding.

	2017	2018	2019	2020	2021	2022	Average
Depreciation and amortization	491.6	517.1	439.3	501.7	525.9	613.1	
PPE	617.7	721.7	836.2	815.0	816.1	836.0	
Depreciation and amortization, % of PPE	79.58%	71.66%	52.53%	61.56%	64.44%	73.33%	67.18%

Table 12 - Average depreciation rate (2017-2022)

Later, Capex will be disclosed at a lower value than D&A. Maintenance CapEx is the company's asset maintenance investment, and higher D&A values suggest the company may want to become asset light.

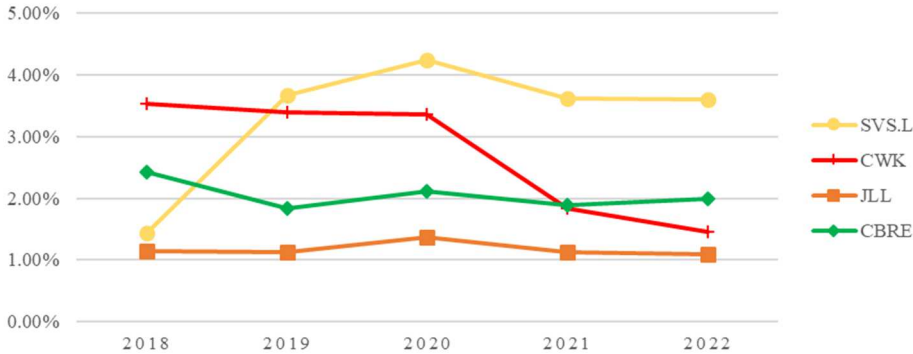


Figure 16 - CBRE vs Peers (D&A)

D&A as a percentage of revenue varies from 1.04% to 3.59% among peers.

5.2.6. Capital Expenditures

As previously indicated, CBRE presents CapEx values that are relatively low compared to the recorded depreciation of assets. This leads to the speculation that there might be significant CapEx being omitted or categorized as operational expenses, such as is commonly the case with Research and Development. However, the reports do not seem to provide evidence of substantial spending on R&D or indicate that such expenditures are significant. Therefore, no capitalization calculation of R&D into CapEx was performed.

Instead, adjustments were made to classify acquisitions, which are typically not categorized in this manner but should be, as CapEx.

An indirect method of calculating CapEx could be through the balance sheet and income statement, via the line items for PPE, and depreciation. The more direct method of calculation is by examining the value related to capital expenditures in the Cash Flow from Investing Activities section. The financial report does not specify which values correspond to maintenance CapEx or growth CapEx so this latter approach was employed, in which the investment in the VTS software was also included to the Capital Expenses line, resulting in the next table.

2017      2018      2019      2020      2021      2022

(\$ in millions), Numbers have been rounded for presentation purposes. Totals may not add due to rounding.

	2017	2018	2019	2020	2021	2022
CASH FLOWS FROM INVESTING ACTIVITIES :						
Capital expenditures	(178.0)	(227.8)	(293.5)	(266.6)	(209.9)	(260.1)
Investment in VTS	-	-	-	-	-	(100.7)
Total Capital Expenditures	(178.0)	(227.8)	(293.5)	(266.6)	(209.9)	(360.9)

Table 13 - Capital expenditures (2017-2022)

There is evident volatility in the reported values, varying with the business cycles and the beginning and ending of significant projects or other strategic activities. Due to this volatility, the results should be smoothed out to arrive at a forecast for future capital needs, not without first adding the respective value and adjusting for acquisitions also reported in the financial statements.

Since there is no reference to the amortization period of acquisitions in CBRE's reports, a useful life of 7 years was assumed, and based on this, the value of Capex was adjusted following this formula:

$$AdjustedCapEx = Capital\ Expenditures + Acquisitions\ of\ other\ firms - Amortization\ of\ such\ acquisitions$$

Consequently, the adjustments were made to the results and can be observed in the next table (see Appendix XII).

	2017	2018	2019	2020	2021	2022
(\$ in millions), Numbers have been rounded for presentation purposes. Totals may not add due to rounding.						
Capital Expenditure	178.0	227.8	293.5	266.6	209.9	360.9
Acquisition - Amortization	(321.3)	(73.1)	(83.1)	(343.1)	319.9	(86.7)
AdjCapex = Capex + Aquisitions - Amortization of Aquisitions	(143.2)	154.7	210.4	(76.5)	529.7	274.2

Table 14 - Adjusted Capex with Acquisitions

This approach to estimating future capital needs is grounded in historical data averages. For the forecasted period, it is assumed that CapEx will represent 0.73% of total revenue. The year 2020 will be excluded from the calculation of this average, as it is deemed an atypical year that does not reflect the typical functioning of the company.

	2017	2018	2019	2020	2021	2022	Average
(\$ in millions), Numbers have been rounded for presentation purposes. Totals may not add due to rounding.							
Total revenue	18,628.8	21,340.1	23,894.1	23,826.2	27,746.0	30,828.2	
AdjCapex	143.2	(154.7)	(210.4)	76.5	(529.7)	(274.2)	
Capex, % of rev	0.77%	-0.72%	-0.88%	0.32%	-1.91%	-0.89%	-0.73%

Table 15 - Capex needs

It is possible to hypothesize that CBRE's conservative asset allocation strategy aims to reduce asset exposure by exercising caution in CapEx in anticipation of economic downturns.

We can estimate future CapEx and depreciation based on the revenue forecast using these figures. CBRE will stabilize after 2025 when CapEx and D&A converge.

	2022	2023E	2024E	2025E	2026E	2027E	2028E
(\$ in millions), Numbers have been rounded for presentation purposes. Totals may not add due to rounding.							
PPE Opening	-	836.0	506.5	418.2	410.9	432.0	464.4
Capex	-	232.1	252.0	273.6	297.1	322.6	350.3
Depreciation	-	561.7	340.3	281.0	276.1	290.2	312.0
PPE Closing	836.0	506.5	418.2	410.9	432.0	464.4	502.7

Table 16 - Depreciation Schedule (2023-2028)

### 5.2.7. Changes in Net Working Capital

This section pertains to liquidity, or the funds necessary to support CBRE's day-to-day operations that are exclusively operational and not financial. The calculation method employed

involves deducting current operational liabilities from the current operational assets, or even the following formula:

$$NWC = \text{Accounts Receivables} + \text{Inventory} - \text{Accounts Payable}$$

Typically, current operational and essential categories for CBRE's operation should be included for an accurate assessment of the company's NWC requirements. Due to their importance, some non-current items have also been added.

In assessing CBRE's assets, several key categories were considered:

**Restricted cash:** Cash allocated for specific purposes, and not available for immediate operational use.

**Receivables:** Refer to the amounts owed to CBRE by customers, representing anticipated future cash receipts.

**Current and non-current contract assets:** Recognized revenues awaiting billing upon contract fulfillment, common in brokerage, development, and incentive fees.

**Prepaid Expenses:** These typically represent payments made before receiving goods or services, like insurance or rent, which will become expenses.

**Other Current Assets:** Liquid assets expected to convert into cash within a year, excluding the above assets.

**Real Estate Under Development:** Properties under development may be current or non-current depending on completion and sale dates. The computation will use this as inventory.

In liabilities, these were essential:

**Accounts payable and accrued expenses:** CBRE's supplier debts and unpaid expenses, indicating future cash outflows.

**Compensation and Benefits Payable:** The company's employee compensation and benefits obligations.

**Accrued Bonus and Profit Sharing:** This includes performance-related bonuses and profit-sharing accrued but not distributed.

**Contract liabilities:** CBRE has received payment but has not performed services or delivered goods, indicating future service obligations.

**Taxes Payable:** Government taxes are accrued but not due at balance sheet date. It is a short-term company obligation paid in the next financial period.

**Other Current Liabilities:** This category would include other short-term non-financial obligations not otherwise classified, which could impact CBRE's liquidity.

The primary objective of this analysis is to ascertain the annual necessities pertaining to NWC for CBRE. The YoY changes in NWC are the most important, as these fluctuations determine the additional capital required to run the business efficiently. A key insight to be drawn here is that any increment in NWC represents an allocation of funds from the firm's FCF. This allocation effectively reduces the surplus cash that is available for other purposes, such as investments, debt repayment, or shareholder distributions.

	2017	2018	2019	2020	2021	2022
(\$ in millions), Numbers have been rounded for presentation purposes. Totals may not add due to rounding.						
Accounts Receivable	3,112.3	3,668.6	4,466.7	4,395.0	5,150.5	5,326.8
Inventories	0.0	0.0	0.0	0.0	0.0	0.0
Other Operating short term assets	788.9	894.2	1,009.0	1,049.6	1,153.1	1,346.7
Other Operating long term assets	0.0	0.0	387.3	431.3	462.0	309.7
Accounts Payable	3,556.5	4,230.4	5,023.0	5,164.1	6,150.2	6,228.9
Other Operating short term liabilities	245.7	241.1	261.2	380.5	726.1	687.0
Working Capital	99.0	91.4	578.7	331.1	(110.7)	67.4
Changes in NWC	-	7.6	(487.3)	247.6	441.8	(178.1)

Table 17 - NWC

The analysis of the annual changes in NWC for CBRE reveals that the average yearly requirement for additional working capital is approximately 0.25% of total revenue. The year 2020 was excluded from the calculation as it does not reflect the standard year for this company.

	2017	2018	2019	2020	2021	2022	Average
(\$ in millions), Numbers have been rounded for presentation purposes. Totals may not add due to rounding.							
Total revenue	18,628.8	21,340.1	23,894.1	23,826.2	27,746.0	30,828.2	
Changes in NWC	-	7.6	(487.3)	247.6	441.8	(178.1)	
Changes in NWC, % of rev	-	0.04%	-2.04%	1.04%	1.59%	-0.58%	-0.25%

Table 18 - Changes in NWC

This notably low percentage reflects CBRE's effective working capital management, indicating a strong liquidity framework and little need to allocate significant portions of its FCF to operational needs. This assumption considers that CBRE can optimize its operations, benefiting from its scale and cost controlling measures.

### 5.2.8. Forecast

Considering the assumptions, the forecasted figures are as follows:

For 2023, revenue growth is expected at 3.55%. From 2024 to 2028, we expect 8.58% annual revenue growth. EBIT margin is expected to average 4.19% from 2023 to 2028. Additionally, capital expenditure is expected to be 0.73% of revenue and NWC 0.25%.

These findings allow for a provisional FCF distribution for 2024–2028. Considering CBRE's current level of stability, a 5-year period was selected for the short-term analysis, utilizing a 2-stage model.

### 5.2.9. Free Cash Flow to Firm

The following data was considered a representation of the historical outcomes:

	2017	2018	2019	2020	2021	2022
(\$ in millions), Numbers have been rounded for presentation purposes. Totals may not add due to rounding.						
Revenue	18,628.8	21,340.1	23,894.1	23,826.2	27,746.0	30,828.2
EBIT	1,266.4	1,314.0	1,259.8	969.8	1,637.5	1,511.9
Tax Rate, %	40.16%	22.74%	5.20%	22.10%	23.60%	14.10%
NOPLAT	757.9	1,015.2	1,194.3	755.5	1,251.1	1,298.7
Depreciation and amortization	491.6	517.1	439.3	501.7	525.9	613.1
Capital Expenditure	143.2	(154.7)	(210.4)	76.5	(529.7)	(274.2)
Changes in NWC	-	7.6	(487.3)	247.6	441.8	(178.1)
FCFF	-	1,385.3	935.8	1,581.3	1,689.0	1,459.6

Table 19 - FCFF for the historical period

An analysis of the consolidated data from 2017 and the average tax rate during that period was conducted to estimate future tax payments. As of December 2017, President Trump had signed legislation that reduced the corporate tax rate from 35% to 21%. That justifies CBRE's abrupt tax reduction, which can be seen in Table 22. This number remained unchanged after President Biden's election.

This is the tax rate regarded as the projected value for future years, and therefore, it was also utilized in the calculation of WACC.

Tax Rate	2017	2018	2019	2020	2021	2022
Historical tax rate, %	40.16%	22.74%	5.20%	22.10%	23.60%	14.10%
Average tax rate, %						<u>21.32%</u>

Table 20 - Average tax rate (2017-2022)

The forecast for the period 2023-2028 is based on the previously delineated assumptions. Throughout the forecast period, the tax rate remains constant at 21.32%, simplifying the

assessment of tax implications on future profitability and allowing for a more direct calculation of post-tax financial indicators.

	2023E	2024E	2025E	2026E	2027E	2028E
(\$ in millions), Numbers have been rounded for presentation purposes. Totals may not add due to rounding.						
Revenue	31,922.4	34,661.3	37,635.3	40,864.4	44,370.5	48,177.5
EBIT	1,235.6	1,470.7	1,596.9	1,733.9	1,882.7	2,044.2
Tax Rate, %	21.32%	21.32%	21.32%	21.32%	21.32%	21.32%
NOPLAT	972.2	1,157.2	1,256.5	1,364.3	1,481.4	1,608.5
Depreciation and amortization	561.7	340.3	281.0	276.1	290.2	312.0
Capital Expenditure	(232.1)	(252.0)	(273.6)	(297.1)	(322.6)	(350.3)
Changes in NWC	(78.9)	(85.7)	(93.1)	(101.1)	(109.7)	(119.1)
FCFF	1,222.9	1,159.7	1,170.8	1,242.2	1,339.2	1,451.0

Table 21 - FCFF for the forecasted period

The forecasted FCFF for 2023 is expected to decrease when compared to 2022, and then the projected FCFF is expected to increase, in line with the anticipated growth. The low need for new NWC and CapEx investments boosts CBRE's liquidity projection.

### 5.2.10. Capital Structure

Having established the FCF forecast for the short-term of CBRE, our next step involves determining the discount rate to compute the present value of the company's projected future cash flows.

CBRE's debt levels are comparatively modest, and it possesses adequate cash and cash equivalents to meet its debt obligations. We will proceed with the assumption that this structure will remain constant for the projected years, given CBRE's historical stability in its debt-to-equity ratio. As a result, the goal here is to compute the weights for calculating WACC, which must be determined using the market values of either equity (common stock) and debt.

Total Debt, \$ 'MM	5,376.6
Total Equity, \$ 'MM	25,862.3
Total Capital, \$ 'MM	31,238.9
Debt Weighting, %	17.21%
Equity Weighting, %	82.79%

Table 22 - CBRE Capital Structure

### 5.2.11. *The Risk-Free Rate*

It is crucial to remember that the risk-free rate can change over time and between various nations or regions. Variables like inflation, the state of the economy, and central bank policies can have an impact on the level of the risk-free rate. As a result, to determine the risk-free rate for a given analysis or valuation, it is necessary to take into account the current state of the market and use reliable sources.

At the time of this analysis, according to CNBC, the yield of the 10-year US bond (10-Year Treasury) was at 4.25%, and that's the number we are going to use.

### 5.2.12. *Beta*

Bloomberg projects that the future beta of CBRE will be 1.36. By standard, the platform conducts a regression analysis of the past trading prices of the stock in comparison to the S&P 500 (SPX) using weekly data spanning a two-year timeframe. Instead of the usual 5 years, a two-year timeframe was used to exclude the pre-covid years and reflect the current economy. The adjusted beta that presupposes that a security's beta will eventually move in the direction of the market average can be calculated as follows:

$$\text{Adjusted beta} = \frac{2}{3} \times 1.36 + \frac{1}{3} \times 1.00 = 1.24$$

### 5.2.13. *Market Risk Premium*

Due to the academic nature of this thesis and the findings of Welch's survey, which indicate that finance professors commonly utilize this figure, we will employ 5% as MRP.

### 5.2.14. *Cost of Debt*

S&P Global Ratings affirms CBRE Group is "BBB+", so we have considered a credit spread of 1.55%. This spread is an additional rate over the benchmark rate, which compensates the lenders for the risk associated with lending to the company. The benchmark rate that has to be added to the Risk-Free Rate at the time, at 4.25%.

$$kd = 1.55\% + 4.25\% = 5.80\%$$

When applying the WACC, the portion related to the tax shield benefit is subtracted due to the formula. Given the tax rate of 21.32%, the after-tax cost of debt is computed as:

$$\text{After tax Cost of Debt} = 5.80\% \times (1 - 21.32\%) = 4.56\%$$

### 5.2.15. *Cost of Capital*

To properly understand the computation of the cost of capital, it is crucial to first finalize the calculation of the cost of equity. In this calculation, we have already established the beta ( $\beta$ ) as a crucial component in determining the cost of equity. To calculate equity investors' risk above the risk-free rate, beta is multiplied by MRP. Our formula thus becomes:

$$ke = 4.25\% + 1.24 \times 5.00\% = 10.45\%$$

WACC is the blend of the cost of equity and the after-tax cost of debt, proportioned according to their respective shares in the company's capital structure.

Stock Price, \$	82.29
Raw Beta	1.36
Adjusted Beta	1.24
Diluted Shares Outstanding, MM	314.3
Cost of Debt, % (BBB+)	5.80%
Tax Rate, %	21.32%
After-tax Cost of Debt, %	<u>4.56%</u>
Risk-Free Rate, %	4.25%
Market Risk Premium, %	<u>5.00%</u>
Cost of Equity, %	<u>10.45%</u>
Total Debt, \$ 'MM	5,376.6
Total Equity, \$ 'MM	25,862.3
Total Capital, \$ 'MM	31,238.9
Debt Weighting, %	17.21%
Equity Weighting, %	<u>82.79%</u>
WACC, %	<u>9.44%</u>

Table 23 - WACC

Assuming the capital structure comprises 82.79% equity and 17.21% debt, the WACC is computed as follows:

$$WACC = 82.79\% \times 10.45\% + 17.21\% \times 5.80\% \times (1 - 21.32\%) = 9.44\%$$

This WACC signifies the average cost to the company of its borrowed and equity capital. Our analysis has previously illustrated that ROC averaged around 11.1%. A ROC that exceeds the WACC indicates that the company is creating value. It implies that the company is generating returns on its investments that are greater than the overall cost of the capital used for these investments.

### 5.2.16. Terminal Value

The perpetuity growth model was applied, adhering strictly to the perpetuity formula framework. This model was employed to ascertain the TV of CBRE, premised on the hypothesis that the firm will indefinitely sustain its generation of FCF, expanding at an unvarying growth rate.

The calculation integrates the previously determined cost of capital and adopts a 2.00% long-term growth rate. This rate is cautiously set, slightly exceeding the inflation rate, suggesting that CBRE is a mature enterprise operating within a stable industry or economic landscape. Furthermore, as evidenced in Appendix X, CBRE has achieved organic growth that exceeds the growth rate of its industry. Therefore, it is reasonable to infer that, over time, CBRE will also surpass the growth rate of the economy. Despite this, stress test 1 will compute the results of varying this variable.

Terminal Value (Perpetuity Growth method)	
Long-term growth rate, %	2.00%
WACC, %	9.44%
Free cash flow (t + 1)	1,480.0

Table 24 - Terminal Value data

$$TV = \frac{1,480.0}{(9.44\% - 2.00\%)} = 19,898.7 (\$ 'MM)$$

Furthermore, to arrive at a definitive valuation, the present value (PV) of the TV needs to be calculated:

$$PV \text{ of } TV = \frac{19,898.7}{(1 + 9.44\%)^5} = 12,676.2 (\$ \text{ 'MM})$$

### 5.3. Base-case Scenario

The outcomes of the forecast period are meticulously presented in the subsequent table:

	2023E	2024E	2025E	2026E	2027E	2028E
(\$ in millions), Numbers have been rounded for presentation purposes. Totals may not add due to rounding.						
Revenue	31,922.4	34,661.3	37,635.3	40,864.4	44,370.5	48,177.5
EBIT	1,235.6	1,470.7	1,596.9	1,733.9	1,882.7	2,044.2
Tax Rate, %	21.32%	21.32%	21.32%	21.32%	21.32%	21.32%
NOPLAT	972.2	1,157.2	1,256.5	1,364.3	1,481.4	1,608.5
Depreciation and amortization	561.7	340.3	281.0	276.1	290.2	312.0
Capital Expenditure	(232.1)	(252.0)	(273.6)	(297.1)	(322.6)	(350.3)
Changes in NWC	(78.9)	(85.7)	(93.1)	(101.1)	(109.7)	(119.1)
FCFF	1,222.9	1,159.7	1,170.8	1,242.2	1,339.2	1,451.0
WACC, %		9.44%	9.44%	9.44%	9.44%	9.44%
PV FCFF		1,059.7	977.5	947.7	933.7	924.3
SUM PV FCFF						4,843.0

Table 25 - PV for the short time FCF

With this comprehensive dataset and if we add the TV computed earlier, we progress to the pivotal stage of calculating the Enterprise Value:

$$\text{Enterprise Value (EV)} = 4,843.0 + 12,676.2 = 17,519.2 (\$ \text{ 'MM})$$

In the accompanying table, which consolidates all the final data, it is evident that the Intrinsic Value per share of the firm has been calculated to be \$40.12 (See Appendix XIII).

SUM PV FCFF, \$ 'MM	4,843.0
PV of Terminal Value \$ 'MM	12,676.2
Enterprise Value \$ 'MM	17,519.2
Add: Cash & Equivalents \$ 'MM	1,261.2
Less: Net Debt \$ 'MM	5,376.6
Less: Preferred Equity \$ 'MM	0.0
Less: Minority Interest \$ 'MM	795.6
Implied Equity Value \$ 'MM	12,608.2
Shares Outstanding, MM	314.3
<b>Equity Value Per Share, \$</b>	<b>40.12</b>

Table 26 - Intrinsic value per share

The calculation of \$40.12 per share implies that each share of the company is estimated to be worth this amount when considering the company's future cash flows, debt, and equity

structure, among other financial metrics considered in this analysis. This figure is particularly useful for investors in making informed decisions about buying, holding, or selling the stock. If the market price is below this intrinsic value, it may indicate that the stock is undervalued, representing a potential investment opportunity. Conversely, if the market price is above this intrinsic value, it might suggest that the stock is overvalued.

The next step is to stress certain variables to have a prudent approach and to ensure that the decision-making process regarding the intrinsic value and investment in the company is not based solely on static figures.

#### **5.4. Bull and Bear Case Scenario**

To study a Bull and/or Bear case scenario it is necessary to perform a sensitivity analysis. This technique, often referred to as stress testing, involves altering key variables within the valuation model to examine how small changes in these variables can impact the overall valuation. In the realm of financial modeling, the emphasis on certain key variables is crucial due to their substantial impact on outcomes. These variables are pivotal in assessing the resilience and robustness of investment decisions under varying scenarios and economic conditions.

In this CBRE's case, three specific variables were meticulously examined to exhaustion. To add further depth to the analysis, slight variations were introduced. Small intervals of plus or minus 0.50% were applied to the reference values established in the base case. This approach allowed for a nuanced understanding of how minor shifts in these key variables could influence the overall financial projections and valuation of CBRE.

Firstly, the discount rate, as WACC is an essential variable. Adjusting the discount rate is crucial for understanding how shifts in market conditions or changes in risk perceptions might influence the company's value. In the financial analysis conducted for CBRE, the discount rate plays a dual role, serving as the central metric for both stress tests. This rate is pivotal in assessing the impact of varying economic scenarios on the company's valuation.

Growth Rate is also a critical factor. Altering the projected growth rate can have a profound effect on future cash flows and, by extension, the overall valuation of a company. By testing various growth scenarios, ranging from pessimistic to optimistic, a spectrum of potential outcomes can be explored, providing valuable insights into the company's future prospects. In the analysis of CBRE, a critical component of the stress test involved examining the Long-term

Growth Rate in conjunction with the discount rate. This variable is particularly critical as it has a substantial impact on the TV, which constitutes a major portion of the EV.

		Long-term growth rate, %				
		1.00%	1.50%	2.00%	2.50%	3.00%
WACC, %	8.44%	42.02	45.26	48.99	53.36	58.53
	8.94%	38.28	41.06	44.23	47.90	52.19
	9.44%	34.99	37.39	40.12	43.24	46.84
	9.94%	32.07	34.16	36.52	39.20	42.26
	10.44%	29.45	31.29	33.35	35.67	38.30

Table 27 - Stress test 1 - Growth rate and WACC

Operating Margins are also subject to variability. They can fluctuate due to numerous factors, such as changes in input costs, pricing strategies, and operational efficiency. Testing different margin scenarios is instrumental in highlighting potential impacts on the company's profitability. Once again, this variable was tested in parallel with the discount rate.

		EBIT, % of rev				
		3.24%	3.74%	4.24%	4.74%	5.24%
WACC, %	40.12	32.24	40.61	48.99	57.37	65.75
	8.44%	28.72	36.48	44.23	51.99	59.75
	8.94%	25.68	32.90	40.12	47.34	54.56
	9.44%	23.02	29.77	36.52	43.27	50.02
	9.94%	20.68	27.01	33.35	39.69	46.03

Table 28 - Stress test 2 - EBIT and WACC

Upon comparing both models, it becomes evident that the variation in the operating margin has a more pronounced impact than the variance in the long-term growth rate. The highest value from the second analysis, which focuses on operating margin variability, is \$65.75, higher than that from the long-term growth rate variation analysis (\$58.53). Similarly, the lowest value in the operating margin analysis (\$20.68) is lower than that in the long-term growth rate analysis (\$29.45).

Other variables were considered, but their variation was smaller. CapEx fluctuations can affect both immediate cash outflows and the company's long-term growth trajectory, making it an important variable to consider in financial projections, but it was not relevant compared to the previous.

After careful examination of the lowest and highest values derived from each stress test, the following data was compiled, representing the assumed outcomes for the Bear and Bull Case scenarios.

DCF	LT g, % lo	LT g, % hi	EBIT, % lo	EBIT, % hi	Lo	Hi
Bear Case	29.45	40.12	20.68	40.12	20.68	40.12
Base Case	36.52	44.23	32.90	47.34	32.90	47.34
Bull Case	40.12	58.53	40.12	65.75	40.12	65.75

Table 29 - Low and High limits

A prudent valuation approach was adopted incorporating a contingency margin into the base case scenario. This involved allowing for a controlled fluctuation of a single variable at a time, specifically a variance of 0.50%, rather than adhering to a static value.

**5.5. Conclusion**

Having collected all relevant and conclusive data, we are prepared to consolidate this information into a football field chart. This chart serves as a comprehensive visual representation of the results of various valuation methods. This type of data aggregation provides a comprehensive view of the company's valuation, allowing for a more informed assessment of its financial position.

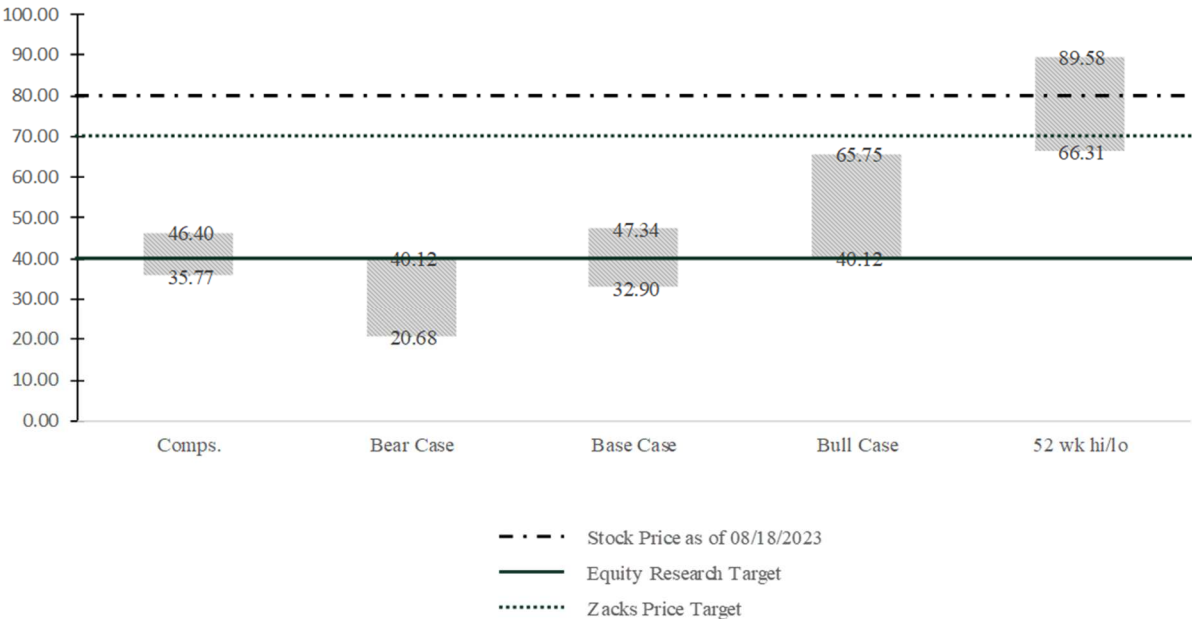


Table 30 - Valuations results

Upon scrutinizing the static price target of \$40.12, determined through the DCF method, an important inference emerges: the stock seems to be overvalued by approximately 50%. The stock's market price exceeds the Base Case interval even with a margin of tolerance.

This discrepancy implies that the current market price (at the time of analysis) is higher than the intrinsic value per share that our financial evaluation determined. The elevated market price reflects investor optimism regarding CBRE's future prospects, suggesting that the market valuation is more bullish than what traditional DCF methodologies would indicate.

The trading price is positioned at the upper end of the 52-Week High/Low range and well above the Bull Case scenario superior limit, indicating market sentiment towards an optimistic forecast for CBRE.

Interestingly enough, the base case scenario fell precisely within the spectrum calculated using comparable multiples. This range of values functions as a standard for verifying the numbers obtained in DCF analysis.

It is worth noting that the Bull Case valuation's upper threshold closely matches the target value set by the Zacks report, which is used as a comparative measure in this thesis. Thus, based solely on this evaluation, it can be deduced that the analyst's projections are excessively optimistic and do not align with our valuation findings. A deeper examination of the data allows for further insights and conclusions.

## 6. COMPARING WITH INVESTMENT BANKING REPORT

Beginning with a careful comparison of the Zacks analyst report and this dissertation, some key differences emerge (Appendix XIV).

At first glance, the revenue projections from the two sources show only minor differences. Zacks projects revenues of \$31.818 billion for 2023 and \$34.139 billion for 2024, whereas this analysis posits slightly elevated figures of \$31.922 billion and \$34.661 billion, respectively. Such differences fall within a variance range of 1 to 2%.

Consequently, we observe that Zacks' report estimates a growth rate of approximately 3.2% for 2023, 7.3% for 2024, and 7.5% for 2025. In contrast, this equity research forecasts a growth rate of 3.55% for 2023 and a more substantial 8.58% for the period 2024–2028, signifying a notable disparity.

The Zacks valuation methodology predominantly focuses on short-term performance, tailored for an investment horizon of one to three months. This quantitative-driven approach is reflective of trends in earnings estimate revisions. Due to being a comparable multiple approach, the specific economic assumptions underlying their \$70.00 price target, equivalent to 13.31x earnings, cannot be explicitly detailed.

Our stress testing indicates that such a price is not achievable even under a Bull Case scenario.

## 7. FINAL RECOMMENDATION

Based on the calculations presented in this report, the final recommendation is to sell the stock. The stock is currently overpriced, indicating that it is not a favorable option to include in the investment portfolio.

There are numerous philosophies regarding the selection of sound investments. One of them is focused on value investing and relies on three identified factors to identify exceptional businesses for investment.

First and foremost, good firms to invest in must have competitive advantages that are difficult to replicate and separate them from their competitors.

Second, for firms to grow, they must have the opportunity to expand within a sector that is currently undergoing expansion.

Third, it is imperative that the management team possess exceptional quality, ensuring that the distribution of capital is conducted with the utmost thoroughness. Additionally, it is crucial that their interests are closely aligned with those of the shareholders.

In this regard, CBRE faces challenges, such as the fact that their product is not particularly difficult to replicate, and the industry is going through a difficult period due to the pandemic-induced shift in the commercial real estate paradigm. This is evident in the previously calculated target price.

Regrettably, the number of exceptional companies in the business world is limited, so it is imperative to exercise caution when evaluating the actual worth of firms. Reliance on multiples alone is insufficient, and a more comprehensive analysis is necessary to prevent significant investment errors. This work alone clearly demonstrates the conflicting results of various comparable multiples; Zacks' method differs significantly from the multiple approaches used in this dissertation and the DCF analysis.

While some argue that valuation is an art, it is crucial that decisions always be based on reliable information and a comprehensive analysis of the business and its industry.

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## **9. APPENDIX**

# APPENDIX I

## *Technology and Proptech*

Proptech integration benefits CRE. User experiences are improved by innovative property management solutions that improve efficiency and sustainability. Modernization is essential to compete in a fast-changing industry.

Proptech also helps with digital marketing. Virtual tours, user-friendly online platforms, predictive analytics, and AI-driven chatbots help property managers increase brand visibility, lead generation, and reach. These innovative marketing tools appeal to tech-savvy consumers. Property performance changes as proptech accelerates smart building development. Buildings with advanced technology monitor, control, and optimize systems, boosting energy efficiency, comfort, security, and system connectivity.

Software can simplify rent payments, security deposits, maintenance requests, vendor management, and resident communications. Automating routine tasks saves property managers time, boosts productivity, centralizes decision-making data, and improves stakeholder communication and transparency (Simon, 2023).

## *Sustainability and ESG*

ESG factors are increasingly important in CRE investment decisions. Investors want sustainable, socially responsible assets that match their values. A fundamental shift in investment priorities emphasizes the need for properties that generate financial returns and benefit society and the environment.

Economic benefits can also result from ESG considerations in CRE. These benefits include lower energy costs due to more efficient resource use and higher tenant retention in properties that match their values and offer a sustainable environment.

In addition, ESG factors reduce climate change, social, and governance risks. These factors strengthen real estate investments and prepare them for new challenges and regulations.

The trend of ESG reporting is gaining momentum. Investors increasingly use ESG performance data to make decisions. Companies are also gaining credibility by transparently reporting their ESG practices, attracting more investors and stakeholders (Colliers, 2023).

## APPENDIX II

### *Flexible Workspaces*

The emergence of flexible workspaces is increasingly recognized as a crucial component of the contemporary work environment. Companies are seeking shared co-working spaces and flexible lease terms to meet the needs of their remote workers. This trend is restructuring CRE by decentralizing office locations and devaluing centralized office locations. Businesses that look beyond urban centers can find diverse talent, save money, and build a resilient and adaptable network. Entrepreneurs can help businesses decentralize by developing, consulting, or investing in suburban or rural areas. Reusing commercial spaces as mixed-use developments or community-driven workspaces can revitalize them and boost CRE demand.

The move toward flexible workspaces and decentralized offices is not just a response to global events but a new era in business. It presents opportunities and challenges for entrepreneurs and business leaders to innovate and invest in work and real estate (Chazanas, 2023).

### *Urbanization and Mixed-Use Developments*

Mixed-use developments combine residential, commercial, and retail uses in one property. These projects are now popular in CRE for several reasons. Mixed-use developments have grown due to a shift in live-work-play preferences toward integrated environments with convenience and plentiful amenities. Self-contained micro-cities offer housing, offices, retail shops, restaurants, and entertainment to residents, workers, and visitors. Private equity and REIT investors are increasingly drawn to billion-dollar mixed-use projects. Builders often partner with high-net-worth individuals, institutional investors, sovereign wealth funds, and pension funds to finance these developments.

Office tenants prefer these properties for their experiential workplace and immediate amenities, which raises rental premiums. Due to multiple amenities, multifamily buildings have higher rental rates. Property managers are essential to a consistent and authentic development experience (Zettl, 2023).

## **APPENDIX III**

### *Data Analytics and Market Intelligence*

A KPMG survey from August 2020 shows how data strategy in CRE changes. The survey, which included a wide range of real estate firms worldwide, found that investors, developers, and managers in the CRE industry now see more market, building, and tenant data as a strategic opportunity. Effective resource management, financial planning, and data-driven decision-making are driving this change.

The survey shows growing industry focus on formalized data strategies and this phenomenon is particularly evident within larger corporations. Despite progress, smaller firms, which lack data management expertise and resources, face challenges. The challenges encompass reliance on antiquated tools such as Excel and obstacles in effectively integrating novel technologies. Remote working has accelerated data strategy planning for a third of respondents due to the COVID-19 pandemic. This response shows the industry's adaptability to changing market conditions and the growing importance of data management in overcoming them (KPMG, 2021).

### *Globalization and Cross-Border Investments*

The trends in cross-border investment in the CRE sector have experienced notable effects in recent periods. Global cross-regional capital flows fell 49% in the second half of 2022 compared to 2021. Worsening macroeconomic conditions, rising interest rates, and financing issues contributed to this decline.

Europe attracted 75% of global cross-regional investment. Conversely, during the latter half of 2022, cross-regional capital inflows into Europe decreased by 26% compared to the same period the previous year. Asia-Pacific and North America both witnessed substantial contractions, with declines of 78% and 53%, respectively.

As interest rates stabilize and the macroeconomic outlook improves, cross-regional investment should rise (CBRE, Global Real Estate Capital Flows H2 2022, 2023).

# APPENDIX IV

## Swot analysis:

<p><b>Strengths:</b>          Fortune 500 Ranking and Commercial Real Estate Leadership.           Real Estate Services Global Leadership: Their presence in over 100 countries and broad service spectrum strengthen their market position.          Brand Equity: Strong brand equity indicates customer trust and reputation.          Client Diversity: A diverse client base ensures revenue stability and market resilience.           Finances for Growth and Acquisitions: Strong growth, improved margins, and a solid foundation for strategic acquisitions.          Expertise and Technology: Industry expertise and technology investments boost service value.          Competitive Advantages: Comprehensive solutions and a strong cash position are advantages.</p>	<p><b>Weaknesses:</b>          The company's reliance on the US market could expose it to regional economic fluctuations.          Seasonal Revenue Fluctuations : Financial performance trends can affect stability.           Market Competition and Client Overdependence: Intense competition and client dependence can cause revenue instability.          Compliance and Geographic Concentration: Complex regulations and heavy revenue dependence on North America and Europe present challenges.</p>
<p><b>Opportunities:</b>          Growth through Strategic Acquisitions: Advanced Property Solutions Maintain and Full Spectrum Group are examples of strategic acquisitions.          Global market expansion: Emerging economies and markets offer growth opportunities.          Technological Advancements and Urbanization Trends: Leveraging technology and urbanization can enhance service offerings and market reach.          Sustainability and ESG Focus: ESG practices promote environmental awareness and attract new customers.          Strategy and Construction Industry Growth: Partnerships and the global construction industry's positive outlook allow for expansion and revenue growth.</p>	<p><b>Threats:</b>          Economy and Market Volatility: Global financial instability and credit market crises pose risks.           Cyclical Nature of Real Estate: Cyclical industry revenue streams are vulnerable to macroeconomic shifts.          Regulatory Changes and Geopolitical Risks : Real estate and tax laws and geopolitical tensions can affect operations.           Security Concerns and Exchange Rate Fluctuations: Currency fluctuations and data breaches pose financial and reputational risks.          Intense Competition and Regulatory Compliance: Challenges include fierce competition from Cushman &amp; Wakefield and Jones Lang LaSalle and extensive industry regulations.</p>

## APPENDIX V

TABLE 1 - BALANCE SHEET

	2017	2018	2019	2020	2021	2022
(\$ in millions), Numbers have been rounded for presentation purposes. Totals may not add due to rounding.						
<b>ASSETS</b>						
Current Assets :						
Cash and cash equivalents	751.8	777.2	971.8	1,896.2	2,431.0	1,318.3
Restricted cash	73.0	86.7	122.0	143.1	108.8	86.6
Receivables , less allowance for do	3,112.3	3,668.6	4,466.7	4,395.0	5,150.5	5,326.8
Warehouse receivables	928.0	1,342.5	993.1	1,411.2	1,303.7	455.4
Contract assets	273.1	307.0	328.0	318.2	338.7	391.6
Prepaid expenses	215.3	254.9	282.7	295.0	333.9	311.5
Income taxes receivable	49.6	71.7	93.9	93.8	44.1	81.5
Other current assets	227.4	245.6	276.3	293.3	371.7	557.0
<b>Total Current Assets</b>	<b>5,630.6</b>	<b>6,754.2</b>	<b>7,534.5</b>	<b>8,845.6</b>	<b>10,082.4</b>	<b>8,528.7</b>
Property and equipment , net of acc	617.7	721.7	836.2	815.0	816.1	836.0
Goodwill	3,254.7	3,652.3	3,753.5	3,821.6	4,995.2	4,868.4
Other intangible assets , net of accu	1,399.1	1,441.3	1,379.5	1,367.9	2,409.4	2,192.7
Operating lease assets	-	-	998.0	1,020.4	1,046.4	1,033.0
Investments in unconsolidated subsi	238.0	216.2	426.7	452.4	1,196.1	1,317.7
Non - current contract assets	-	-	201.8	153.6	135.6	137.5
Real estate under development	-	-	185.5	277.6	326.4	172.3
Non - current income taxes receive	-	-	139.1	43.6	33.2	51.9
Deferred tax assets , net	98.7	51.7	73.9	91.5	157.0	265.6
Investments held in trust - special p	-	-	-	402.5	-	-
Other assets , net	479.5	619.4	668.5	747.4	875.7	1,109.7
<b>Total Assets</b>	<b>11,718.4</b>	<b>13,456.8</b>	<b>16,197.2</b>	<b>18,039.1</b>	<b>22,073.5</b>	<b>20,513.4</b>
<b>LIABILITIES AND EQUITY</b>						
Current Liabilities :						
Accounts payable and accrued exp	1,573.7	1,919.8	2,436.1	2,692.9	2,916.3	3,078.8
Compensation and employee benef	1,078.3	1,189.4	1,325.0	1,287.4	1,539.3	1,459.0
Accrued bonus and profit sharing	904.4	1,121.2	1,262.0	1,183.8	1,694.6	1,691.1
Operating lease liabilities	-	-	168.7	208.5	232.4	229.6
Contract liabilities	100.6	82.2	108.7	162.0	280.7	276.3
Income taxes payable	70.6	68.1	30.2	57.9	246.0	184.5
Warehouse lines of credit ( which fi	910.8	1,328.8	977.2	1,384.0	1,277.5	447.8
Revolving credit facility	-	-	-	-	-	178.0
Other short - term borrowings	0.0	-	4.5	5.3	32.7	42.9
Current maturities of long - term de	0.0	3.1	1.8	1.5	-	427.8
Other current liabilities	74.5	90.7	122.3	160.6	199.4	226.2
<b>Total Current Liabilities</b>	<b>4,712.9</b>	<b>5,803.4</b>	<b>6,436.5</b>	<b>7,144.0</b>	<b>8,418.9</b>	<b>8,242.0</b>
Long - term debt , net of current m	1,999.6	1,767.3	1,761.2	1,380.2	1,538.1	1,085.7
Non - current operating lease liabili	-	-	1,057.8	1,116.8	1,116.6	1,080.4
Non - current income taxes payabl	-	-	93.6	54.8	54.8	54.8
Non - current tax liabilities	140.8	172.6	86.0	88.0	144.9	148.8
Deferred tax liabilities , net	147.2	107.4	34.6	124.5	405.3	282.1
Other liabilities	543.2	596.2	454.4	625.3	1,035.9	1,013.9
<b>Total Liabilities</b>	<b>7,543.8</b>	<b>8,446.9</b>	<b>9,924.1</b>	<b>10,533.5</b>	<b>12,714.4</b>	<b>11,907.7</b>
Commitments and contingencies	-	-	-	-	-	-
Non - controlling interest subject to	-	-	-	385.6	-	-
Equity :	-	-	-	-	-	-
CBRE Group , Inc. Stockholders ' -	-	-	-	-	-	-
Class A common stock ; \$ 0.01 pa	3.4	3.4	3.3	3.4	3.3	3.1
Additional paid - in capital	1,220.5	1,149.0	1,115.9	1,074.6	798.9	-
Accumulated earnings	3,443.0	4,504.7	5,793.1	6,530.1	8,366.6	8,832.9
Accumulated other comprehensive	(552.4)	(718.3)	(679.7)	(529.7)	(640.7)	(982.8)
<b>Total CBRE Group , Inc. Stockhol</b>	<b>4,114.5</b>	<b>4,938.8</b>	<b>6,232.7</b>	<b>7,078.3</b>	<b>8,528.2</b>	<b>7,853.3</b>
Non - controlling interests	60.1	71.1	40.4	41.8	830.9	752.5
<b>Total Equity</b>	<b>4,174.6</b>	<b>5,009.9</b>	<b>6,273.1</b>	<b>7,120.1</b>	<b>9,359.1</b>	<b>8,605.7</b>
<b>Total Liabilities and Equity</b>	<b>11,718.4</b>	<b>13,456.8</b>	<b>16,197.2</b>	<b>18,039.1</b>	<b>22,073.5</b>	<b>20,513.4</b>

# APPENDIX VI

TABLE 2 - CASH FLOW STATEMENT

	2017	2018	2019	2020	2021	2022
(\$ in millions), Numbers have been rounded for presentation purposes. Totals may not add due to rounding.						
<b>CASH FLOWS FROM OPERATING ACTIVITIES :</b>						
Net income	703.6	1,065.9	1,291.5	755.9	1,841.9	1,424.0
Adjustments to reconcile net income to net cash provided by operating activities :						
Depreciation and amortization	406.1	452.0	439.2	501.7	525.9	613.1
Amortization and write - off of fina	10.8	35.2	8.7	82.7	8.3	7.7
Gains related to mortgage servicing	(200.4)	(229.4)	(246.7)	(298.0)	(142.9)	(202.5)
Asset impairments	-	-	89.8	88.7	-	58.7
Gain associated with remeasuring o	-	(100.4)	-	-	-	-
Net realized and unrealized losses (	(9.4)	7.4	(28.9)	(17.4)	(42.0)	30.5
Provision for doubtful accounts	8.0	19.8	20.4	44.4	24.5	17.0
Net compensation expense for equi	93.1	128.2	127.7	60.4	184.9	160.3
Gain recognized upon deconsolidat	-	-	-	-	(187.5)	-
Equity income from unconsolidated	(210.2)	(324.7)	(160.9)	(126.2)	(618.7)	(229.0)
Distribution of earnings from uncon	211.9	336.9	199.0	156.0	520.4	389.3
Proceeds from sale of mortgage loa	18,052.8	20,230.7	19,805.1	20,937.5	17,194.6	14,526.9
Origination of mortgage loans	(17,655.1)	(20,591.6)	(19,390.0)	(21,268.1)	(17,015.8)	(13,651.8)
( Decrease ) increase in warehouse	(343.9)	418.0	(351.6)	406.8	(106.5)	(829.6)
Tenant concessions received	19.3	38.4	21.2	48.0	31.2	11.6
Purchase of equity securities	(110.6)	(99.8)	(83.0)	(11.1)	(7.2)	(28.2)
Proceeds from sale of equity securi	68.5	75.1	46.9	13.7	8.7	30.4
Decrease ( increase ) in real estate	2.5	(4.6)	34.8	(105.6)	(54.7)	94.6
( Increase ) decrease in receivables	(534.2)	(773.4)	(824.5)	371.0	(766.0)	(503.4)
Increase in accounts payable and a	159.1	273.8	306.7	105.5	104.7	64.1
( Decrease ) increase in compensat	148.7	270.4	244.9	(100.1)	729.7	(2.0)
( Increase ) decrease in net income	108.2	(47.1)	(274.4)	173.6	248.3	(133.2)
Other operating activities , net	(34.4)	(49.6)	(52.5)	11.4	(117.8)	(219.4)
Net cash provided by operating act	894.4	1,131.2	1,223.4	1,830.8	2,364.2	1,629.1
<b>CASH FLOWS FROM INVESTING ACTIVITIES :</b>						
Capital expenditures	(178.0)	(227.8)	(293.5)	(266.6)	(209.9)	(260.1)
Acquisition of businesses , including	(118.4)	(322.6)	(355.9)	(27.8)	(781.5)	(173.6)
Contributions to unconsolidated sul	(68.7)	(62.8)	(105.9)	(146.4)	(334.5)	(385.2)
Distributions from unconsolidated s	63.7	61.7	33.3	88.7	75.9	87.2
Investment in VTS	-	-	-	-	-	(100.7)
Investment in Altus Power , Inc. Cl-	-	-	-	-	(220.0)	-
Purchase of equity securities	(15.6)	(21.4)	(12.0)	-	-	-
Proceeds from sale of marketable s	15.6	16.3	15.6	-	212.7	-
Purchase of marketable securities - -	-	-	-	(402.5)	-	-
Purchase of available for sale debt :	(19.3)	(23.4)	(8.9)	-	-	-
Proceeds from the sale of available	15.8	5.8	4.7	-	-	-
Other investing activities , net	2.4	13.4	1.7	10.5	(23.6)	(0.0)
Net cash used in investing activities	(302.6)	(560.7)	(721.0)	(744.1)	(1,280.9)	(832.5)
<b>CASH FLOWS FROM FINANCING ACTIVITIES :</b>						
Proceeds from senior term loans ..	200.0	1,002.7	300.0	-	-	-
Repayment of senior term loans	(751.9)	(450.0)	(300.0)	-	(300.0)	-
Proceeds from revolving credit facil	1,521.0	3,258.0	3,609.0	835.7	26.6	1,833.0
Repayment of revolving credit facil	(1,521.0)	(3,258.0)	(3,609.0)	(835.7)	-	(1,655.0)
Repayment of 5.25 % senior notes -	-	(820.0)	-	(499.7)	-	-
Sale of non - controlling interest - s	-	-	-	393.7	-	-
Redemption of non - controlling int-	-	-	-	-	(205.1)	-
Proceeds from notes payable on re-	-	-	-	90.6	78.4	39.3
Repayment of notes payable on rea-	-	-	-	(24.7)	(109.5)	(27.7)
Proceeds from issuance of 2.500 % -	-	-	-	-	492.3	-
Repayment of debt assumed in acq -	-	-	(110.7)	-	-	-
Repayment of debt assumed in acq -	-	(26.3)	-	-	-	-
Repurchase of common stock	-	(161.0)	(145.1)	(50.0)	(368.6)	(1,850.3)
Acquisition of businesses ( cash pai	(24.0)	(18.7)	(42.1)	(44.7)	(17.8)	(34.4)
Units repurchased for payment of tr	(29.5)	(29.4)	(18.4)	(43.8)	(38.9)	(37.9)
Non - controlling interest contributi	5.3	25.4	46.6	2.2	0.9	2.4
Non - controlling interest distributio	(8.7)	(13.4)	(4.0)	(4.3)	(4.6)	(0.9)
Other financing activities , net	(18.9)	(15.9)	1.8	(41.9)	(44.4)	(34.5)
Net cash used in financing activities	(627.7)	(506.6)	(271.9)	(222.8)	(490.6)	(1,766.1)
Effect of currency exchange rate ch	29.3	(24.8)	(0.6)	81.6	(92.1)	(165.5)
NET ( DECREASE ) INCREASE	(6.6)	39.1	229.8	945.5	500.5	(1,134.9)
CASH AND CASH EQUIVALEN	831.4	824.8	863.9	1,093.7	2,039.2	2,539.8
CASH AND CASH EQUIVALEN	824.8	863.9	1,093.7	2,039.2	2,539.8	1,404.8
<b>SUPPLEMENTAL DISCLOSURES OF CASH FLOW INFORMATION :</b>						
Cash paid during the year for :						
Interest	117.2	104.2	86.7	67.5	41.1	89.2
Income tax payments , net	357.0	375.8	365.1	51.7	330.4	604.4
Non - cash investing and financing activities :						
Deferred purchase consideration - '-	-	-	-	-	485.4	-
Non - controlling interest as part of	-	-	-	-	774.1	-
Investment in alignment shares and :-	-	-	-	-	141.9	-
Reduction in redeemable non - con	-	-	-	-	211.5	-
Reduction of trust account - special-	-	-	-	-	189.8	-

## APPENDIX VII

TABLE 3 - INCOME STATEMENT

	2017	2018	2019	2020	2021	2022
(\$ in millions), Numbers have been rounded for presentation purposes. Totals may not add due to rounding.						
<b>GAAP CONSOLIDATED INCOME STATEMENT</b>						
Total net revenue	9,409.0	10,837.5	14,679.9	13,790.5	17,009.5	18,776.5
Pass through costs also recognized	9,219.8	10,502.6	9,214.2	10,035.7	10,736.5	12,051.7
Total revenue	18,628.8	21,340.1	23,894.1	23,826.2	27,746.0	30,828.2
Cost of revenue	14,305.1	16,449.2	18,688.9	19,047.6	21,579.4	24,239.5
Operating, administrative and other	2,858.7	3,365.8	3,436.0	3,306.2	4,074.2	4,649.5
Depreciation and amortization	406.1	452.0	439.3	501.7	525.9	613.1
Asset impairments	0.0	0.0	89.8	88.7	0.0	58.7
Total costs and expenses	17,569.9	20,267.0	22,654.0	22,944.2	26,179.5	29,560.8
Gain (loss) on disposition of real es	19.8	14.8	19.7	87.8	71.0	244.4
Operating income	1,078.7	1,087.9	1,259.8	969.8	1,637.5	1,511.9
Equity income (loss) from unconsol	210.2	324.6	161.0	126.2	618.6	229.0
Other income (loss)	9.4	93.0	28.7	17.3	203.5	(11.9)
Interest expense, net of interest inc	127.0	98.7	85.6	67.8	50.3	69.0
Write-off of financing costs on extir	0.0	28.0	2.6	75.6	0.0	1.9
Income before provision for (benefi	1,171.3	1,378.8	1,361.3	969.9	2,409.3	1,658.2
Provision for (benefit from) income	467.8	312.9	70.0	214.2	567.4	234.2
Tax rate (2) (3)	40.16%	22.74%	5.20%	22.10%	23.60%	14.10%
Net income	703.6	1,065.9	1,291.3	755.7	1,841.9	1,424.0
Less: Net income (loss) attributable	6.5	2.7	9.0	3.8	5.4	16.6
Net income attributable to CBRE C	697.1	1,063.2	1,282.3	751.9	1,836.5	1,407.4
Add:						
Interest expense, net of interest inc	127.0	98.7	85.7	67.8	50.3	69.0
Write-off of financing costs on extir	0.0	28.0	2.6	75.6	0.0	1.9
Provision for (benefit from) income	467.7	312.9	69.9	214.2	567.4	234.2
Depreciation and amortization	406.1	452.0	439.3	501.7	525.9	613.1
Asset impairments	0.0	0.0	89.8	88.7	0.0	58.7
Net income (loss) attributable to nc -	-	-	9.0	3.8	5.4	16.6
EBITDA	1,697.9	1,954.7	1,978.6	1,703.7	2,985.5	2,400.9
Weighted avg. shares outstanding fi	340.8	343.1	340.5	338.4	339.7	327.7
Diluted EPS attributable to CBRE C	2.05	3.10	3.77	2.22	5.41	4.29

# APPENDIX VIII

TABLE 3 - INCOME STATEMENT

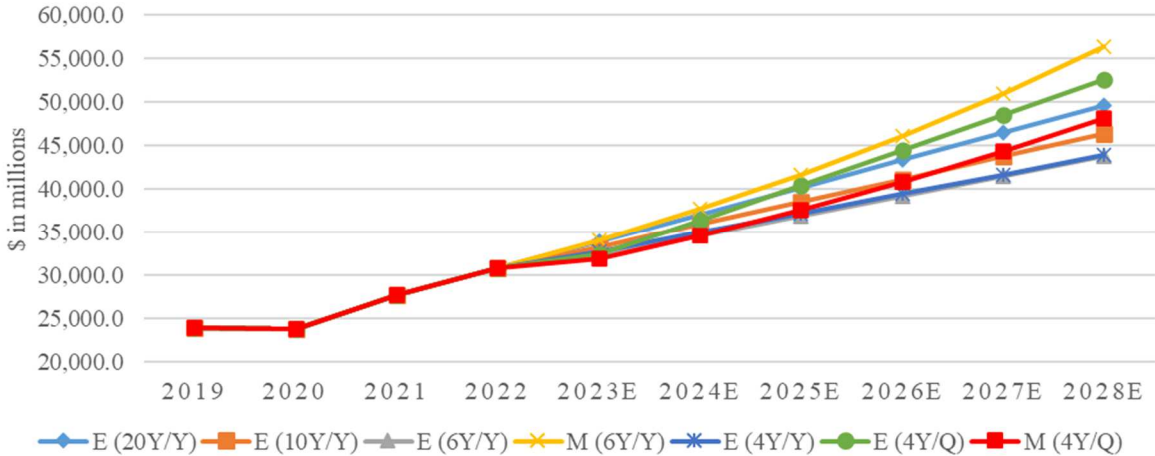
	Q1 2019	Q2 2019	Q3 2019	Q4 2019	2019	Q1 2020	Q2 2020	Q3 2020	Q4 2020	2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021	2021	Q1 2022	Q2 2022	Q3 2022	Q4 2022	2022	Q1 2023	Q2 2023	
<b>GAAP CONSOLIDATED INCOME STATEMENT</b>																							
Total net revenue	3,075.2	3,533.9	3,631.5	4,439.3	14,679.9	3,431.3	2,987.7	3,248.5	4,123.0	13,790.5	3,359.0	3,911.7	4,173.0	5,565.8	17,009.5	4,376.0	4,802.6	4,622.8	4,975.1	18,776.5	4,180.8	4,477.5	
Pass through costs also recog	2,060.3	2,180.2	2,293.6	2,680.1	9,214.2	2,457.9	2,393.7	2,396.6	2,787.5	10,035.7	2,579.9	2,546.9	2,625.3	2,984.4	10,736.5	2,956.9	2,968.7	2,906.7	3,219.4	12,051.7	3,230.3	3,242.4	
Total revenue	5,135.5	5,714.1	5,925.1	7,119.4	23,894.1	5,889.2	5,381.4	5,645.1	6,910.5	23,826.2	5,938.9	6,458.6	6,798.3	8,550.2	27,746.0	7,332.9	7,771.3	7,529.5	8,194.5	30,828.2	7,411.1	7,719.9	
Cost of revenue	4,022.0	4,445.8	4,687.3	5,533.8	18,688.9	4,712.7	4,399.5	4,564.6	5,370.8	19,047.6	4,719.5	5,016.7	5,258.9	6,584.3	21,579.4	5,752.2	6,054.0	5,934.5	6,498.8	24,239.5	6,006.4	6,179.5	
Operating, administrative and	792.9	877.4	809.6	956.1	3,436.0	790.1	770.8	794.2	951.1	3,306.2	828.3	957.2	1,025.7	1,263.0	4,074.2	1,066.0	1,188.8	1,080.3	1,314.5	4,649.5	1,208.9	1,088.8	
Depreciation and amortization	105.8	106.5	111.6	115.4	439.3	113.8	116.4	127.7	143.8	501.7	122.1	119.1	122.6	162.1	525.9	149.0	162.4	142.1	159.6	613.1	161.5	154.4	
Asset impairments	89.0	0.0	0.0	0.8	89.8	75.2	0.0	0.0	13.5	88.7	0.0	0.0	0.0	0.0	0.0	10.4	26.4	0.0	21.9	58.7	0.0	0.0	
Total costs and expenses	5,009.7	5,429.7	5,608.5	6,606.1	22,654.0	5,691.8	5,286.7	5,486.5	6,479.2	22,944.2	5,669.9	6,093.0	6,407.2	8,009.4	26,179.5	6,977.6	7,431.6	7,156.9	7,994.8	29,560.8	7,376.8	7,422.7	
Gain (loss) on disposition of r	19.2	0.0	0.0	0.5	19.7	22.8	(0.5)	52.8	12.7	87.8	0.2	0.9	18.5	51.4	71.0	21.6	177.2	1.7	43.9	244.4	3.1	9.3	
Operating income	145.0	284.4	316.6	513.8	1,259.8	220.2	94.2	211.4	444.0	969.8	269.2	366.5	409.6	592.2	1,637.5	376.9	516.9	374.3	243.6	1,511.9	37.4	306.4	
Equity income (loss) from un	72.7	21.8	25.8	40.7	161.0	20.6	19.5	32.4	53.7	126.2	83.5	212.1	163.8	159.2	618.6	42.9	119.2	234.0	(167.0)	229.0	141.7	(7.5)	
Other income (loss)	20.8	4.3	0.9	2.7	28.7	(0.2)	5.2	7.9	4.4	17.3	2.7	12.0	7.7	181.1	203.5	(14.4)	(6.9)	7.8	1.7	(11.9)	2.5	5.6	
Interest expense, net of intere	21.2	24.6	21.8	18.0	85.6	16.0	18.0	17.8	16.0	67.8	10.1	13.8	11.0	15.4	50.3	12.8	18.5	19.9	17.7	69.0	28.4	43.0	
Write-off of financing costs o	2.6	0.0	0.0	0.0	2.6	0.0	0.0	0.0	0.0	75.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	0.0	1.9	0.0	
Income before provision for (	214.7	285.9	321.5	539.2	1,361.3	224.7	100.9	233.9	410.4	969.9	345.3	576.8	370.1	917.1	2,409.3	392.6	610.7	594.3	60.6	1,658.2	153.1	261.6	
Provision for (benefit from) i	43.9	62.5	63.5	(99.9)	70.0	51.2	18.8	49.1	95.1	214.2	76.3	133.4	133.5	224.2	567.4	(3.7)	120.8	142.7	(25.5)	234.2	28.0	55.4	
Tax rate (2) (3)	0.2	0.2	0.2	(0.2)	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	(0.0)	0.2	0.2	(0.4)	0.1	0.2	0.2	
Net income	170.8	223.4	258.0	639.1	1,291.3	173.5	82.1	184.8	315.3	755.7	269.0	443.4	436.6	692.9	1,841.9	396.3	489.9	451.6	86.1	1,424.0	125.1	206.2	
Less: Net income (loss) attrib	6.4	(0.3)	1.4	1.5	9.0	1.3	0.2	0.7	1.6	3.8	2.8	0.8	0.9	0.9	5.4	4.0	2.6	5.0	5.0	16.6	8.2	4.8	
Net income attributable to CI	164.4	223.7	256.6	637.6	1,282.3	172.2	81.9	184.1	313.7	751.9	266.2	442.6	435.7	692.0	1,836.5	392.3	487.3	446.6	81.1	1,407.4	116.9	201.4	
Add:																							
Interest expense, net of intere	21.2	24.6	21.8	18.1	85.7	16.0	18.0	17.8	16.0	67.8	10.1	13.8	11.0	15.4	50.3	12.8	18.5	19.9	17.7	69.0	28.4	43.0	
Write-off of financing costs o	2.6	0.0	0.0	0.0	2.6	0.0	0.0	0.0	0.0	75.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	0.0	1.9	0.0	0.0	
Provision for (benefit from) i	43.9	62.5	63.5	(100.0)	69.9	51.2	18.8	49.1	95.1	214.2	76.3	133.4	133.5	224.2	567.4	(3.7)	120.8	142.7	(25.5)	234.2	28.0	55.4	
Depreciation and amortization	105.8	106.5	111.6	115.4	439.3	113.8	116.4	127.7	143.8	501.7	122.1	119.1	122.6	162.1	525.9	149.0	162.4	142.1	159.6	613.1	161.5	154.4	
Asset impairments	89.0	0.0	0.0	0.8	89.8	75.2	0.0	0.0	13.5	88.7	0.0	0.0	0.0	0.0	0.0	10.4	26.4	0.0	21.9	58.7	0.0	0.0	
Net income (loss) attributable	6.4	(0.3)	1.4	1.5	9.0	1.3	0.2	0.7	1.6	3.8	2.8	0.8	0.9	0.9	5.4	4.0	2.6	5.0	5.0	16.6	8.2	4.8	
EBITDA	433.3	417.0	454.9	673.4	1,978.6	429.7	235.3	379.4	659.3	1,703.7	477.5	709.7	703.7	1,094.6	2,985.5	564.8	818.0	758.2	259.8	2,400.9	343.0	458.9	
Weighted avg. shares outstan	340.2	340.5	341.1	340.3	340.5	339.7	337.4	337.7	338.8	338.4	339.6	339.5	340.3	339.5	339.7	337.1	329.8	324.7	319.2	327.7	315.4	314.3	
Diluted EPS attributable to C	0.48	0.66	0.75	1.87	3.77	0.51	0.24	0.55	0.93	2.22	0.78	1.30	1.28	2.04	5.41	1.16	1.48	1.38	0.25	4.29	0.37	0.64	

(\$ in millions). Numbers have been rounded for presentation purposes. Totals may not add due to rounding.

# APPENDIX IX

Several analyses were conducted and compared to validate the previous forecasting method to reduce the risk of relying on one. Forecasts created with Excel's specialized tools (E) differed from those created using the geometric mean (M) of quarterly (Q) or annual (Y) analysis. The coding also includes the number of years evaluated. For example, Excel's E(20Y/Y) analysis forecasts annual revenue over the past two decades. M(6Y/Y) analysis forecasts using the geometric mean of the previous six years' revenue figures.

Finally, the forecasted revenue used in the DCF is derived from the data set M(4Y/Q), which, as previously stated, is not only manually derived from quadrimester data over the last four years but also takes into account the growth of individual segments before aggregating them to project CBRE's total anticipated revenue. This method falls within a balanced forecast estimation range, aligning closely with the mean of all other methods (see the figure below).



# APPENDIX X

Pro forma revenue values represent CBRE's total revenue if the acquisitions took place on January 1st of the corresponding fiscal year. The revenue considered to be derived from acquisitions corresponds to the difference between Proforma and CBRE actual revenue.

Year	Revenue	Major Acq.	Pro Forma	Dif, \$	Dif, %
2022	30.82	none	30.82	0.00	0.0%
2021	27.74	Turner & Townsend	28.55	0.81	2.9%
2020	23.82	Turner & Townsend	24.72	0.90	3.8%
2019	23.89	Telford	24.16	0.27	1.1%
2018	21.34	FacilitySource	21.80	0.46	2.2%
2017	18.62	FacilitySource	18.78	0.16	0.9%
2016	17.36	FacilitySource	17.47	0.11	0.6%
2015	10.85	GWS	12.97	2.12	19.5%
2014	9.04	GWS	12.49	3.45	38.2%
2013	7.18	Norland	7.79	0.61	8.5%
2012	6.51	Norland	7.01	0.50	7.7%
2011	5.9	REIM	6.14	0.24	4.1%

Average Growth Rates:

2018-2022	
Total	9.62%
Acquisitio	2.0%
Organic	7.63%

2016-2022	
Total	10.04%
Acquisitio	1.6%
Organic	8.40%

2013-2022	
Total	17.57%
Acquisitio	7.8%
Organic	9.80%

2011-2022	
Total	16.22%
Acquisitio	7.5%
Organic	8.77%

Average (from all periods)	
Acquisitio	4.71%
Organic	8.6%
Total	13.36%

## APPENDIX XI

### Revenue Growth and Operating Margin Analysis

Revenue Growth	2018	2019	2020	2021	2022	Geometric Average
CBRE Revenue	21,340.1	23,894.1	23,826.2	27,746.0	30,828.2	
CBRE	100.00%	111.97%	111.65%	130.02%	144.46%	9.63%
JLL Revenue	16,318.4	17,983.2	16,589.9	19,367.0	20,862.1	
JLL	100.00%	110.20%	101.66%	118.68%	127.84%	6.33%
CIGI Revenue	2,825.4	3,045.8	2,786.9	4,089.1	4,459.5	
CIGI	100.00%	107.80%	98.63%	144.73%	157.83%	12.09%
MMI Revenue	814.8	806.4	716.9	1,296.4	1,301.7	
MMI	100.00%	98.97%	87.98%	159.11%	159.76%	12.43%
SVS.L Revenue	2,131.3	2,335.3	2,106.0	2,597.9	2,780.9	
SVS.L	100.00%	109.57%	98.81%	121.89%	130.48%	6.88%
WD Revenue	725.2	817.2	1,083.7	1,259.2	1,258.8	
WD	100.00%	112.68%	149.43%	173.62%	173.56%	14.78%
CWK Revenue	8,219.9	8,751.0	7,843.7	9,388.7	10,105.7	
CWK	100.00%	106.46%	95.42%	114.22%	122.94%	5.30%
ISS Revenue	10,302.9	10,997.7	9,775.2	9,990.8	10,715.3	
ISS	100.00%	106.74%	94.88%	96.97%	104.00%	0.99%
NMRK Revenue	2,047.6	2,218.1	1,905.0	2,906.4	2,705.5	
NMRK	100.00%	108.33%	93.04%	141.95%	132.13%	7.21%

Operating Margin	2018	2019	2020	2021	2022	Average
CBRE Cost of Revenue + Operating Ex	19,815.0	22,124.9	22,353.8	25,653.6	28,889.0	
CBRE	7.15%	7.40%	6.18%	7.54%	6.29%	6.91%
JLL Cost of Revenue + Operating Ex	15,386.6	16,881.0	15,662.0	18,021.3	19,661.1	
JLL	5.71%	6.13%	5.59%	6.95%	5.76%	6.03%
CIGI Cost of Revenue + Operating Ex	2,523.3	2,704.4	2,450.5	3,542.6	3,845.6	
CIGI	10.69%	11.21%	12.07%	13.37%	13.77%	12.22%
MMI Cost of Revenue + Operating Ex	696.2	702.0	652.4	1,095.4	1,150.9	
MMI	14.55%	12.95%	9.00%	15.51%	11.59%	12.72%
SVS.L Cost of Revenue + Operating Ex	1,982.3	2,112.2	1,903.1	2,272.7	2,507.0	
SVS.L	6.99%	9.55%	9.64%	12.52%	9.85%	9.71%
WD Cost of Revenue + Operating Ex	574.4	653.5	823.0	1,005.8	1,122.9	
WD	20.80%	20.04%	24.05%	20.12%	10.79%	19.16%
CWK Cost of Revenue + Operating Ex	7,913.5	8,255.1	7,576.1	8,675.1	9,414.8	
CWK	3.73%	5.67%	3.41%	7.60%	6.84%	5.45%
ISS Cost of Revenue + Operating Ex	9,624.7	10,310.7	9,969.3	9,495.8	10,104.4	
ISS	6.58%	6.25%	-1.99%	4.95%	5.70%	4.30%
NMRK Cost of Revenue + Operating Ex	1,744.5	1,921.7	1,595.1	2,762.6	2,256.4	
NMRK	14.80%	13.36%	16.27%	4.95%	16.60%	13.20%

Green - Included as Peers

Red - Excluded as Peers

## APPENDIX XII

Adjusted Capex with Acquisitions.

Unamortized portion of acquisitions.

	2017	2018	2019	2020	2021	2022
(\$ in millions), Numbers have been rounded for presentation purposes. Totals may not add due to rounding.						
Acquisition of businesses , including net assets acquired , intangibles ar	(118.4)	(322.6)	(355.9)	(27.8)	(781.5)	(173.6)
Unamortized portion:						
0 (current)	118.4	322.6	355.9	27.8	781.5	173.6
-1	36.1	101.5	276.5	305.1	23.9	669.8
-2	1,130.5	30.1	84.6	230.4	254.2	19.9
-3	84.0	904.4	24.1	67.7	184.3	203.4
-4	216.1	63.0	678.3	18.0	50.8	138.2
-5	15.0	144.0	42.0	452.2	12.0	33.8
-6	90.1	7.5	72.0	21.0	226.1	6.0

Amortizations in each year:

	2017	2018	2019	2020	2021	2022
(\$ in millions), Numbers have been rounded for presentation purposes. Totals may not add due to rounding.						
Amortization this year:						
0 (current)	16.9	46.1	50.8	4.0	111.6	24.8
-1	6.0	16.9	46.1	50.8	4.0	111.6
-2	226.1	6.0	16.9	46.1	50.8	4.0
-3	21.0	226.1	6.0	16.9	46.1	50.8
-4	72.0	21.0	226.1	6.0	16.9	46.1
-5	7.5	72.0	21.0	226.1	6.0	16.9
-6	90.1	7.5	72.0	21.0	226.1	6.0
Acquisition Value (Current Year)	118.4	322.6	355.9	27.8	781.5	173.6
Acquisitions Amortization	439.7	395.7	439.0	371.0	461.6	260.3
Acquisition - Amortization	(321.3)	(73.1)	(83.1)	(343.1)	319.9	(86.7)

Adjusted values for CapEx:

	2017	2018	2019	2020	2021	2022
(\$ in millions), Numbers have been rounded for presentation purposes. Totals may not add due to rounding.						
Capital Expenditure	178.0	227.8	293.5	266.6	209.9	360.9
Acquisition - Amortization	(321.3)	(73.1)	(83.1)	(343.1)	319.9	(86.7)
AdjCapex = Capex + Aquisitions - Amortization of Aquisitions	(143.2)	154.7	210.4	(76.5)	529.7	274.2

# APPENDIX XIII

## DCF Valuation

(\$ in millions). Numbers have been rounded for presentation purposes. Totals may not add due to rounding.

	2017	2018	2019	2020	2021	2022	2023E	2024E	2025E	2026E	2027E	2028E
Revenue	18,628.8	21,340.1	23,894.1	23,826.2	27,746.0	30,828.2	31,922.4	34,661.3	37,635.3	40,864.4	44,370.5	48,177.5
EBITDA	1,697.9	1,954.7	1,978.6	1,703.7	2,985.5	2,400.9	2,412.9	2,620.0	2,844.8	3,088.8	3,353.9	3,641.6
EBIT	1,266.4	1,314.0	1,259.8	969.8	1,637.5	1,511.9	1,235.6	1,470.7	1,596.9	1,733.9	1,882.7	2,044.2
Tax Rate, %	40.16%	22.74%	5.20%	22.10%	23.60%	14.10%	21.32%	21.32%	21.32%	21.32%	21.32%	21.32%
NOPLAT	757.9	1,015.2	1,194.3	755.5	1,251.1	1,298.7	972.2	1,157.2	1,250.5	1,364.3	1,481.4	1,608.5
Depreciation and amortization	491.6	517.1	439.3	501.7	525.9	613.1	561.7	340.3	281.0	276.1	290.2	312.0
Capital Expenditure	143.2	(154.7)	(210.4)	76.5	(529.7)	(274.2)	(232.1)	(252.0)	(273.6)	(297.1)	(322.6)	(350.3)
Changes in NWC	-	7.6	(487.3)	247.6	441.8	(178.1)	(78.9)	(85.7)	(93.1)	(101.1)	(109.7)	(119.1)
FCFF	-	1,385.3	935.8	1,581.3	1,689.0	1,459.6	1,222.9	1,159.7	1,170.8	1,242.2	1,339.2	1,451.0
WACC, %								9.44%	9.44%	9.44%	9.44%	9.44%
PV FCFE								1,059.7	977.5	947.7	933.7	924.3
SUM PV FCFE												4,843.0

### DCF VALUATION

(\$ in millions). Numbers have been rounded for presentation purposes. Totals may not add due to rounding.

Terminal Value (Perpetuity Growth method)		
Long-term growth rate, %	2.00%	
WACC, %	9.44%	
Free cash flow (t + 1)	1,480.0	
Terminal Value	19,898.7	
Present Value of Terminal Value	12,676.2	
Intrinsic Value		17,519.2
Enterprise Value		1,261.2
Add: Cash & Equivalents		5,376.6
Less: Net Debt		0.0
Less: Preferred Equity		795.6
Less: Minority Interest		12,608.2
Implied Equity Value		314.3
Shares Outstanding, MM		40.12
<b>Equity Value Per Share, \$</b>		
Stock Price as of 18/08/2023	82.29	
Stock is trading below (above) fair value, %	(51.25%)	

## **APPENDIX XIV**

### **ZACKS REPORT**

**CBRE Group Inc. (CBRE)**

**\$82.29** (Stock Price as of 08/18/2023)

Price Target (6-12 Months): **\$70.00**

Long Term: 6-12 Months | **Zacks Recommendation: Underperform**  
 (Since: 07/28/23)  
 Prior Recommendation: Neutral

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Short Term: 1-3 Months | **Zacks Rank: (1-5) 4-Sell**  
 Zacks Style Scores: VGM: D  
 Value: C | Growth: D | Momentum: F

**Summary**

CBRE Group offers a wide array of real estate products and services. Although the company's second-quarter 2023 results benefited from its diversification efforts across asset types, business lines, client types and geographies, the expansion of its resilient business and healthy outsourcing business, persistent macroeconomic uncertainty and its adverse impact on commercial real estate transactions remains a key concern for its transaction-based businesses in the near term. Limited credit availability amid high interest rates has led investors to adopt a cautious approach, delaying the closing timeline for transactions. Further, adverse foreign currency fluctuations add to CBRE Groups' woes. For 2023, while we expect total revenues to improve 3.2% year over year, earnings per share (EPS), adjusted, are projected to decline 19.2%.

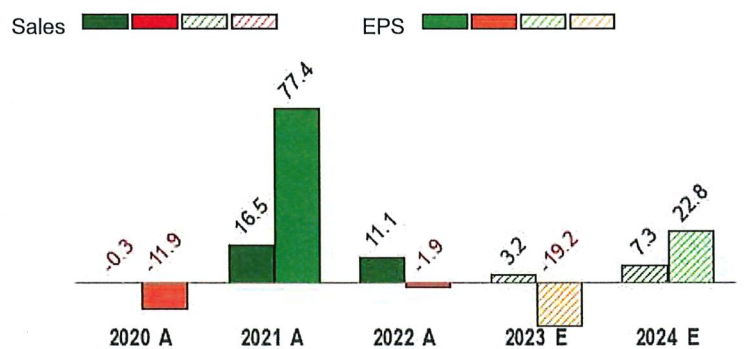
**Price, Consensus & Surprise<sup>(1)</sup>**



**Data Overview**

52 Week High-Low	<b>\$89.58 - \$66.31</b>
20 Day Average Volume (sh)	<b>1,415,148</b>
Market Cap	<b>\$25.5 B</b>
YTD Price Change	<b>6.9%</b>
Beta	<b>1.36</b>
Dividend / Div Yld	<b>\$0.00 / 0.0%</b>
Industry	<b>Real Estate - Operations</b>
Zacks Industry Rank	<b>Bottom 13% (214 out of 246)</b>

**Sales and EPS Growth Rates (Y/Y %)<sup>(2)</sup>**



Last EPS Surprise	<b>6.5%</b>
Last Sales Surprise	<b>2.1%</b>
EPS F1 Est- 4 week change	<b>-8.7%</b>
Expected Report Date	<b>10/26/2023</b>
Earnings ESP	<b>0.0%</b>
P/E TTM	<b>19.6</b>
P/E F1	<b>17.9</b>
PEG F1	<b>-44.7</b>
P/S TTM	<b>0.8</b>

**Sales Estimates (millions of \$)<sup>(2)</sup>**

	Q1	Q2	Q3	Q4	Annual*
2024	7,854 E	8,195 E	8,597 E	9,493 E	34,139 E
2023	7,411 A	7,720 A	7,847 E	8,840 E	31,818 E
2022	7,333 A	7,771 A	7,530 A	8,194 A	30,828 A

**EPS Estimates<sup>(2)</sup>**

	Q1	Q2	Q3	Q4	Annual*
2024	0.90 E	1.15 E	1.40 E	2.20 E	5.65 E
2023	0.92 A	0.82 A	1.12 E	1.74 E	4.60 E
2022	1.39 A	1.83 A	1.13 A	1.33 A	5.69 A

\*Quarterly figures may not add up to annual.

(1) The data in the charts and tables, except the estimates, is as of 08/18/2023.

(2) The report's text, the analyst-provided estimates, and the price target are as of 07/31/2023.

## Overview

Headquartered in Dallas, TX, CBRE Group, Inc. is a commercial real estate services and investment firm, offering a wide range of services to tenants, owners, lenders and investors in office, retail, industrial, multi-family and other types of commercial real estates in all major metropolitan areas across the globe. The services include facilities, transaction and project management; property management; investment management; appraisal and valuation; property leasing; strategic consulting; property sales; mortgage services and development services. With more than 115,000 employees (excluding Turner & Townsend employees), the company served clients in more than 100 countries as of Dec 31, 2022.

CBRE Group reports on three global business segments: Advisory Services, Global Workplace Solutions and Real Estate Investments. However, effective Jan 1, 2021, the company's organizational structure has been realigned.

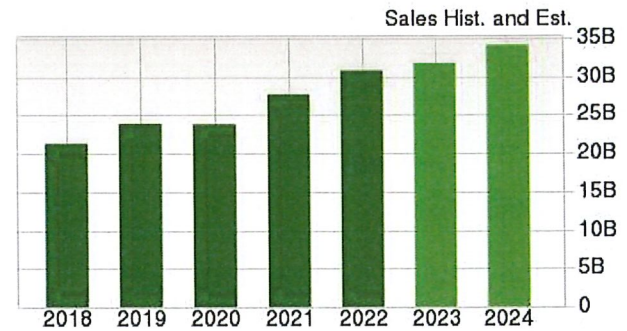
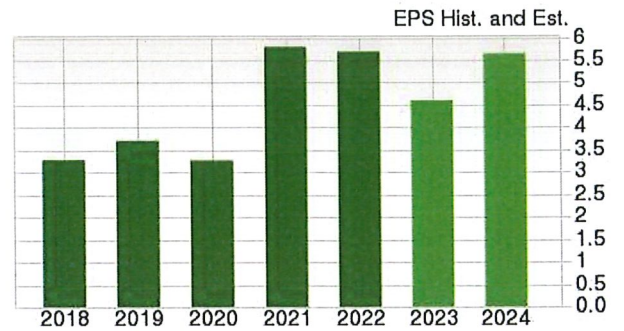
Advisory Services offers a broad range of services globally. This includes property leasing, property sales, mortgage services, property management, and valuation.

Global Workplace Solutions (GWS) offers an extensive suite of integrated, contractually-based outsourcing services to occupiers of real estate, including facilities management and project management.

Notably, effective Jan 1, 2021, transaction services were completely moved under the Advisory Services segment, while project management was entirely moved under the Global Workplace Solutions segment. Earlier transaction services and project management were divided between the Global Workplace Solutions segment and the Advisory Services segment.

Real Estate Investments includes investment management services provided globally and development services in the United States, the United Kingdom and Continental Europe.

At the end of second-quarter 2023, assets under management (AUM) decreased by \$1.3 billion from first-quarter 2023 to \$147.6 billion, mainly due to lower asset values.



As of 07/31/2023



As of 08/18/2023

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## Reasons To Sell:

- ▼ CBRE Group's Advisory Services segment, mainly property sales and leasing, had been widely affected by the pandemic. Though things have improved from the initial days of the health crisis, the global economic recovery has been uneven, with persistent uncertainty and geopolitical unrest. With challenging capital market conditions amid high interest rates, many capital sources have tightened their underwriting standards, reducing credit availability. Under these circumstances, investors have either paused or reconsidered their buying decisions, causing a delay in the closing timeline for transactions. Also, a decline in both volume and average deal size has hurt the company's leasing business. These factors adversely impacted CBRE Group's transaction-based businesses in the second quarter of 2023, and any significant turnaround is unlikely in the near term. Management expects the delayed recovery in the capital markets to hurt its earnings for 2023. We expect EPS, adjusted, to decline 19.2% year over year for 2023.
- ▼ CBRE Group faces stiff competition from international, regional and local players in the market. Some of these firms enjoy greater financial resources than the company. Also, some of them are larger on a regional or local basis or have a stronger position in a specific market segment or service offering. This affects the company's ability to do business and crack deals on favorable terms.
- ▼ Given its international presence, CBRE Group often faces an unfavorable foreign currency movement, geopolitical tension and uneasiness in some economies, which impact its top line. For instance, foreign currency fluctuations adversely impacted the company's first-quarter 2023 earnings. Going forward, the company expects its AUM, revenues and earnings to continue being affected by adverse fluctuations in foreign currency exchange rates.

Persistent macroeconomic uncertainty and its adverse impact on commercial real estate transactions raise concerns for CBRE Group. High interest rates and foreign currency fluctuations add to its woes.

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## Risks<sup>(2)</sup>

- CBRE Group has a broad range of real estate products and services, and an extensive knowledge of domestic and international real estate markets. The company's market leading position is likely to give it a competitive edge in navigating through the current challenges and capitalize on compelling opportunities. As the largest commercial real estate services and investment firm (based on 2022 revenues), the company enjoys a robust scale. It is among a few companies offering a full suite of services to multinational clients. Moreover, the company has grown organically, and banked on strategic in-fill acquisitions to boost its service offerings and geographic reach. With an expanded capability to service, the company's number of large clients has increased significantly over the past years. As large corporations continue to seek consolidation of the number of service providers, CBRE Group is expected to remain a beneficiary of this trend.
- CBRE Group has opted for a better-balanced and more resilient business model. In pursuit of this, the company has shifted toward more diversified and contractual revenue base over the past years. Moreover, these businesses are either cyclically resilient or benefit from the secular growth trends of the industry. This makes the company relatively resilient to market disruptions and positions it well to navigate even amid headwinds. In fact, enhanced resiliency has helped its performance even amid the pandemic. Also, geographical diversity has helped the company tide over muted activity in some markets with solid growth elsewhere. On a year-over-year basis, we estimate total revenues to improve 3.2% for 2023, 7.3% for 2024 and 7.5% for 2025.
- The company's solid technology platform helps it to develop and deliver superior analytical, research and client service tools to meet diverse client needs. In fact, strategic reinvestment in its business, specifically on the technology front, is expected to differentiate CBRE Group from its peers. The company has been spending millions, besides opting for the acquisition of technology solution providers in the commercial real estate market. CBRE Group has gained from its cost-cutting efforts and benefited from operational efficiencies and this trend is expected to continue.
- CBRE Group has banked on strategic in-fill acquisitions to widen its geographic coverage, as well as expand and reinforce service offerings. The company focuses on acquiring regional or specialty firms which complement its existing platform as well as independent affiliates in which, at times, it holds small stakes. Moreover, the company opts for larger, transformational deals driven by macro policies. In the second quarter of 2023, CBRE Group completed four in-fill acquisitions for \$143 million in cash and deferred consideration. These comprised three in the Advisory Services segment and one in the GWS business. In 2022, CBRE Group completed 11 in-fill acquisitions. These comprised four in the GWS segment and seven in the Advisory Services segment. Further, during fourth-quarter 2021, CBRE acquired 60% of the ownership interest in Turner & Townsend Holdings Limited, which is a U.K.-based global leader in program, project and cost management, for \$1.27 billion, net of cash received. These opportunistic acquisitions and strategic investments will likely serve as growth drivers, supplementing its organic growth.
- Further, GWS segment, which provides a broad suite of integrated, contractually-based outsourcing services to occupiers of real estate, including facilities management and project management, is well poised to grow. Occupiers of real estate have been increasingly opting for outsourcing and depending on the expertise of third-party real estate specialists to achieve improvement in execution and efficiency. As a result, CBRE Group has been witnessing continued momentum from both new and existing customers and expansion of the local business. Its high-quality client base is bumping up contractual revenues. Also, led by its Turner & Townsend business, the demand for Project management services was robust during the second quarter of 2023. Further, with significant growth from large first-generation outsourcers, the GWS business pipeline remains elevated, offering CBRE Group scope for growth.
- CBRE Group is focused on maintaining a solid balance sheet and ample liquidity despite the challenging macroeconomic conditions. As of Jun 30, 2023, the company had \$4.4 billion in total liquidity. The company's net leverage ratio was 0.79 as of the same date. This is significantly less than CBRE's primary debt covenant of 4.25. In August 2022, the company increased its stock repurchase authorization by \$2 billion to a total of \$4.0 billion, which was effective on an immediate basis. As of Jun 30, 2023, it had \$2.0 billion of the stock-repurchase capacity remaining under its authorized buyback program. Such encouraging moves increase the company's financial flexibility. Additionally, growth is expected to be further boosted by capital deployment focused on sectors and business lines that are poised to benefit considerably from secular growth trends.

## Last Earnings Report

### CBRE Group Q2 Earnings & Revenues Beat, Decline Y/Y

CBRE Group's second-quarter 2023 core EPS of 82 cents surpassed the Zacks Consensus Estimate of 77 cents. The quarterly revenues of \$7.72 billion also compared favorably with the Zacks Consensus Estimate of \$7.56 billion. Results reflected growth in GWS and total growth in its resilient lines of business.

However, on a year-over-year basis, the core EPS declined by 55.2%, while revenues fell 0.7%. Despite growth in GWS and other resilient businesses, severely constrained capital availability affected its sales revenues.

Global leasing revenues declined across all major property types. Amid the current interest rate environment, the pressure on sales and financing businesses, which are sensitive to commercial real estate capital flows, is expected to continue for the rest of the year.

Net revenues decreased 6.8% (5.4% in local currency) year over year to \$4.5 billion. Core EBITDA declined 45.2% (44.2% in local currency) to \$504 million.

In the second quarter of 2023, CBRE completed four in-fill acquisitions for a total of \$143 million in cash and deferred consideration. These included three in Advisory Services and one in the GWS business.

#### Quarter in Detail

CBRE Group's Advisory Services segment reported a year-over-year revenue decrease of 21.1% (19.9% in local currency) to \$2.04 billion. Our estimate for the same was \$2.01 billion.

Global leasing revenues fell 16% (15% in local currency), reflecting declines across all major property types, most notably in office. This decrease was led by the Americas, where revenues fell 22% (21% in local currency). Moreover, the foreign currency movement tempered growth in overseas markets.

Global sales revenues fell 44% (43% in local currency) amid much-constrained capital availability and difficult comparisons with the second quarter of 2022. Global mortgage origination revenues declined 44% (same in local currency) as most debt capital sources remained on the sidelines.

The GWS segment registered a year-over-year increase of 10.6% (12.1% in local currency) in revenues to \$5.4 billion. Our estimate for the same was \$5.33 billion.

With growth in both new and existing clients and the continued expansion of the local business, Facilities management net revenues increased 12% (14% local currency). Also, due to growth across the client base, markedly in the Turner & Townsend business, Project management net revenues rose 14% (16% local currency). Moreover, with significant growth from large first-generation outsourcers, the pipeline remained elevated.

The Real Estate Investments segment experienced a decline of 7.8% (6.7% in local currency) in revenues to \$256 million. Our estimate for the same was \$241.7 million. At the end of the second quarter of 2023, assets under management decreased by \$1.3 billion from the first quarter of 2023 to \$147.6 billion, reflecting lower market asset values.

#### Balance Sheet Position

CBRE Group exited the second quarter of 2023 with cash and cash equivalents of \$1.26 billion, down from \$1.32 billion as of Dec 31, 2022.

As of Jun 30, 2023, CBRE Group had \$4.4 billion in total liquidity. This comprised \$1.3 billion in cash in addition to the ability to borrow a total of \$3.1 billion under its revolving credit facilities, net of any outstanding letters of credit. The company's net leverage ratio was 0.79 as of the same date, significantly less than CBRE's primary debt covenant of 4.25.

During the June-ended quarter, the company did not repurchase any shares. As of Jun 30, 2023, it had \$2 billion of stock-repurchase capacity remaining under its authorized buyback program.

#### Outlook

For full-year 2023, CBRE now projects core EPS to decline by 20% to 25% from last year's record level. The decline is mainly due to delayed capital markets recovery. However, it expects its resilient lines of business, in total, comprising the entire GWS business, loan servicing, property management, valuations and the asset management component of investment management, to grow for the full year at a rate in line with its prior projection.

FY Quarter Ending	12/31/2022
Earnings Reporting Date	Jul 27, 2023
Sales Surprise	2.05%
EPS Surprise	6.49%
Quarterly EPS	0.82
Annual EPS (TTM)	4.20

## Recent News

### CBRE Retains Top Spot in Global Investment Sales Activity in 2022 – Mar 7, 2023

CBRE Group again secured the top spot in commercial real estate investment sales globally in 2022, according to MSCI Real Assets rankings. This marks the 12th consecutive year of the company securing the top position.

Per MSCI Real Assets, CBRE had a 23.4% market share across all property types on a global basis in 2022. This is a massive 740-basis-point lead over the closest competitor.

Apart from being the number one globally, this commercial real estate services and investment firm secured the top spot for commercial real estate investment sales in all three regions — the Americas (22.2%), the Asia Pacific (33.9%), and Europe, Middle East & Africa (21.8%).

Across asset categories, CBRE held the top spot in MSCI Real Assets' global rankings across the five largest asset classes. CBRE enjoyed a 25.8% market share in the office category, 31.3% in industrial, 23.5% in retail, 17.8% in multifamily and 20.0% in the hotels category.

## Valuation

CBRE Group's shares have declined 2.8% over the trailing 12-month period. Stocks in the Zacks sub-industry have declined 10.4%, while the Zacks Finance sector increased 6.5% over the past year.

The S&P 500 Index is up 11.6% over the past year.

The stock is currently trading at 15.67X forward 12-month earnings, which compares to 17.46X for the Zacks sub-industry, 14.28X for the Zacks sector and 20.17X for the S&P 500 Index.

Over the past five years, the stock has traded as high as 23.08X and as low as 7.35X, with a 5-year median of 14.32X. Our Underperform recommendation indicates that the stock will perform worse than the market. Our \$70.00 price target reflects 13.31X earnings.

The table below shows the summary valuation data for CBRE.

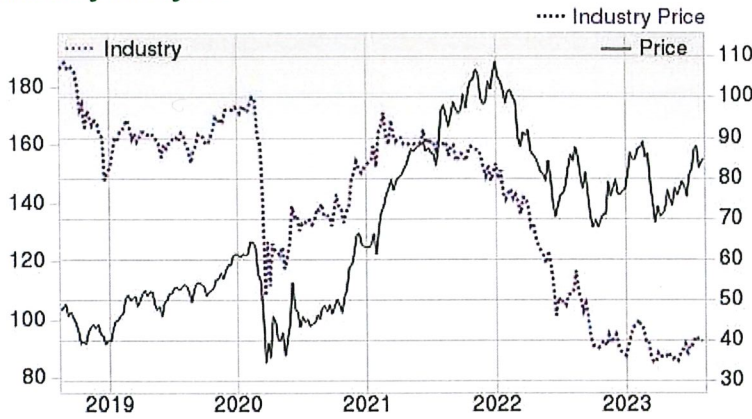
Valuation Multiples - CBRE					
		Stock	Sub-Industry	Sector	S&P 500
P/E F12M	Current	15.67	17.46	14.28	20.17
	5-Year High	23.08	32.05	17.24	23.98
	5-Year Low	7.35	11.34	11.67	14.76
	5-Year Median	14.32	16.10	14.33	18.55
P/S F12M	Current	0.77	2.70	6.87	3.89
	5-Year High	1.35	4.29	10.02	4.45
	5-Year Low	0.38	2.01	5.33	3.09
	5-Year Median	0.75	3.16	6.93	3.81
P/B TTM	Current	2.88	0.54	3.33	6.15
	5-Year High	4.54	1.03	3.78	7.00
	5-Year Low	1.59	0.30	1.86	3.69
	5-Year Median	3.12	0.58	3.08	5.47

As of 07/28/2023

Source: Zacks Investment Research

**Industry Analysis**<sup>(1)</sup> Zacks Industry Rank: Bottom 13% (214 out of 246)

**Top Peers** <sup>(1)</sup>



Company (Ticker)	Rec	Rank
KE Holdings Inc. Spo...(BEKE)	Neutral	1
Colliers Internation...(CIGI)	Neutral	3
FirstService Corpora...(FSV)	Neutral	3
Walker & Dunlop, Inc...(WD)	Neutral	4
Cushman & Wakefield ...(CWK)	Underperform	5
Jones Lang LaSalle I...(JLL)	Underperform	5
Newmark Group, Inc. (NMRK)	Underperform	5
The RMR Group Inc. (RMR)	Underperform	4

Industry Comparison <sup>(1)</sup> Industry: Real Estate - Operations				Industry Peers		
	CBRE	X Industry	S&P 500	BEKE	FSV	JLL
Zacks Recommendation (Long Term)	Underperform	-	-	Neutral	Neutral	Underperform
Zacks Rank (Short Term)	4	-	-	1	3	5
VGM Score	D	-	-	B	B	C
Market Cap	25.50 B	537.19 M	31.09 B	18.33 B	6.55 B	7.78 B
# of Analysts	4	2	15	3	3	4
Dividend Yield	0.00%	0.00%	1.68%	0.00%	0.61%	0.00%
Value Score	C	-	-	C	D	C
Cash/Price	0.05	0.23	0.04	0.48	0.00	0.05
EV/EBITDA	10.89	6.15	13.13	33.17	22.38	6.94
PEG Ratio	-44.72	1.92	2.08	0.36	NA	NA
Price/Book (P/B)	2.87	1.13	3.15	1.75	6.63	1.26
Price/Cash Flow (P/CF)	10.23	9.98	12.55	51.79	22.77	7.11
P/E (F1)	17.89	11.70	17.67	15.81	29.98	14.53
Price/Sales (P/S)	0.83	1.25	2.45	1.85	1.59	0.38
Earnings Yield	5.33%	7.19%	5.60%	6.30%	3.34%	6.88%
Debt/Equity	0.23	0.11	0.64	0.00	0.83	0.36
Cash Flow (\$/share)	8.05	0.56	8.94	0.28	6.45	22.94
Growth Score	D	-	-	B	A	C
Hist. EPS Growth (3-5 yrs)	15.22%	-0.62%	9.69%	NA	19.80%	6.45%
Proj. EPS Growth (F1/F0)	-19.16%	-4.26%	6.06%	173.53%	15.57%	-28.52%
Curr. Cash Flow Growth	1.48%	-6.10%	5.92%	166.35%	21.74%	-17.97%
Hist. Cash Flow Growth (3-5 yrs)	13.64%	6.04%	9.42%	NA	19.66%	12.25%
Current Ratio	1.16	1.90	1.25	3.58	1.90	2.65
Debt/Capital	18.81%	16.61%	39.98%	0.00%	52.04%	26.49%
Net Margin	2.74%	0.33%	11.82%	2.80%	3.25%	1.50%
Return on Equity	15.42%	2.98%	17.42%	4.40%	20.86%	7.05%
Sales/Assets	1.48	0.29	0.55	0.62	1.45	1.31
Proj. Sales Growth (F1/F0)	3.20%	0.00%	4.68%	25.60%	13.70%	0.40%
Momentum Score	F	-	-	B	B	D
Daily Price Chg	0.04%	0.00%	-0.01%	-2.45%	0.27%	-0.06%
1 Week Price Chg	0.73%	0.00%	-2.22%	-8.24%	0.74%	3.61%
4 Week Price Chg	-6.44%	-3.68%	-3.64%	-1.67%	-6.81%	-3.70%
12 Week Price Chg	9.76%	2.68%	5.26%	-2.77%	2.65%	15.42%
52 Week Price Chg	-4.75%	-18.75%	2.01%	-7.63%	7.61%	-12.71%
20 Day Average Volume	1,415,148	24,662	2,117,258	8,406,007	65,722	296,514
(F1) EPS Est 1 week change	-1.24%	0.00%	0.00%	0.00%	0.00%	-4.47%
(F1) EPS Est 4 week change	-8.68%	-0.06%	0.22%	6.82%	3.68%	-15.17%
(F1) EPS Est 12 week change	-11.03%	-0.81%	0.31%	6.82%	3.68%	-20.09%
(Q1) EPS Est Mthly Chg	-35.32%	-1.61%	-0.12%	4.55%	-1.10%	-14.01%

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## Zacks Stock Rating System

We offer two rating systems that take into account investors' holding horizons: Zacks Rank and Zacks Recommendation. Each provides valuable insights into the future profitability of the stock and can be used separately or in combination with each other depending on your investment style.

### Zacks Recommendation

The Zacks Recommendation aims to predict performance over the next 6 to 12 months. The foundation for the quantitatively determined Zacks Recommendation is trends in the company's estimate revisions and earnings outlook. The Zacks Recommendation is broken down into 3 Levels; Outperform, Neutral and Underperform. Unlike many Wall Street firms, we have an excellent balance between the number of Outperform and Neutral recommendations. Our team of 70 analysts are fully versed in the benefits of earnings estimate revisions and how that is harnessed through the Zacks quantitative rating system. But we have given our analysts the ability to override the Zacks Recommendation for the 1200 stocks that they follow. The reason for the analyst over-rides is that there are often factors such as valuation, industry conditions and management effectiveness that a trained investment professional can spot better than a quantitative model.

### Zacks Rank

The Zacks Rank is our short-term rating system that is most effective over the one- to three-month holding horizon. The underlying driver for the quantitatively-determined Zacks Rank is the same as the Zacks Recommendation, and reflects trends in earnings estimate revisions.

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### Zacks Style Scores

The Zacks Style Score is as a complementary indicator to the Zacks rating system, giving investors a way to focus on the highest rated stocks that best fit their own stock picking preferences.

Academic research has proven that stocks with the best Value, Growth and Momentum characteristics outperform the market. The Zacks Style Scores rate stocks on each of these individual styles and assigns a rating of A, B, C, D and F. We also produce the VGM Score (V for Value, G for Growth and M for Momentum), which combines the weighted average of the individual Style Scores into one score. This is perfectly suited for those who want their stocks to have the best scores across the board.

Value Score	C
Growth Score	D
Momentum Score	F
VGM Score	D

As an investor, you want to buy stocks with the highest probability of success. That means buying stocks with a Zacks Recommendation of Outperform, which also has a Style Score of an A or a B.

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