

A COMPARATIVE STUDY ON STOCK VOLATILITY BASED ON AVERAGE TRUE RANGE, FINANCIAL PERFORMANCE AND RETURNS OF TOP IT COMPANIES COGNIZANT TECHNOLOGY SOLUTIONS CORPORATION (CTSH) AND ACCENTURE PLC (ACN).

Ms. CK Sujatha, Research Scholar, Anna University, CEG Chennai.

Dr. Saravanan Assistant Professor, Anna University Regional Campus, Madurai.

Abstract:

Stock market volatility is study on investment risk around the mean and moving average of stock price over time. The ways to measure volatility is by Standard deviation, Beta value and Average True Range. When the volatility is high it implies more significant variations in stock prices, whereas lower volatility indicates more stable and predictable market circumstances.

Analysing the various causes of the volatility and its impact in the changing price levels. This study on stock market volatility allows investors to evaluate the possible risks and its benefits depending on performance of the company.

As per the Rank system the volatility of top performing technology service companies are compared to study the efficiency of the price strategy and performance. Cognizant Technology Solutions Corporation and Accenture plc are global multinational technological professional services company are compared based on the trading activity, Average True Range, Sharpe Ratio and Earnings before Interest & Tax.

Keywords: Volatility, Market Sentiments, Beta and Average True Range.

III. Literature Review

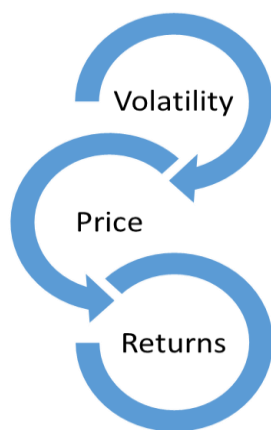
Stock price volatility is the variability of factors cause on stock price volatility, changes in future cash flow expectations and investor's noise trading. These cash flow expectations are largely driven by macroeconomic or microeconomic fundamentals. These variables are financial variables that have a direct or indirect impact on stock price dynamics. The noise trading involves with non-fundamental factors. Technically we call them as behavioural factors of investors, in other words, non-financial variables. Therefore, these stock volatility determinants can be broken down into three categories, Macroeconomic Determinants, Company fundamentals (Microeconomic Variables), and Behavioural Determinants. Hereafter, the theoretical background and empirical background of the above categories are discussed one by one individually. Macroeconomic Determinants the stock market operates under the financial system of a country; whereas the financial system is a blend of economic activities and variables. Conceptually, price behaviour of the stock market depends on the current and future economic fundamentals, since firms' earning projections are mainly driven by the economic health. Stock volatility is a mix of several macro determinants with different degrees of influence depending on the nature of the business of the subject stock. Point is that the future cash flows of a firm should be connected with the influential macro determinants to capture the future business conditions and stock behaviour. **Ross (1976)** has introduced the APT theory for determining the financial asset return. This is the most prominent theory for the relationship between macroeconomic variables and stock volatility. APT is a multifactor model in order to capture the linear relationships between asset return and the variability of macroeconomic determinants. Moreover, the APT theory is mainly driven by the basis of systematic risk which was initiated by **Sharpe (1964)**. Systematic risk is a return concept for accumulating the general economic risk of an asset. Therefore, the APT is the best initiation theory for explaining the sensitivity of the stock price with respect to macroeconomic fluctuations. In addition to that, **Fama & French (1995; 2006)** has introduced a multifactor model for identifying the price volatility as a function of asset risk factors. These risk factors include a mix of company fundamentals as well as general economic

variables. Therefore, the model has less explanatory power for emphasizing the macro determinants of stock price volatility. In conclusion, the APT is a well-known and simple explanation as a model and as a theory. However, empirical results do not provide consistent results as the theory says. Because, some studies emphasized that macro variables are significant, but other studies rejected the macroeconomic significance. Table 01 shows the comparison of empirical inconsistency between Developed, Emerging, and Developing markets.

According to "*Avijit Banerjee*" (1998) reviewed Fundamental Analysis and Technical Analysis to analyze the worthiness of the individual securities needed to be acquired for portfolio construction. Technical Analysis detects the most appropriate time to buy or sell the stock. It aims to avoid the pitfalls of wrong timing in the investment decisions.

III. Market Volatility

Market Volatility is measured by VIX (Volatility Index). Prices can rise and fall quickly due to a variety of factors, including geopolitical events, economic data releases, and company earnings reports. Higher Volatility indicates uncertainty or major economic events.



Volatility, Price and Returns are interconnected concepts in Stock Market. Volatility increase the Stock Prices which implies Higher Volatility leads to unpredictable events and investors balance the risk to achieve the expected Returns.

Causes of Stock Market volatility.

Economic Factors include macroeconomic variables influence impact on business profitability, consumer spending, and investor confidence, causing stock values to fluctuate.

Corporate earnings are based on acquisitions, products, management changes, and regulatory events can all cause volatility in certain stocks and sectors.

Political instability, wars, terrorist attacks, and conflicts impacts uncertainty and stock price volatility.

Investor sentiment, emotions, and market psychology all contribute to stock market volatility.

Market volatility should analyze their **risk tolerance** and management. The systematic method to manage risk management and eradicate rational judgments based on short-term market changes.

Stock Market Volatility: Understanding Fluctuations

Stock price volatility refers to the degree of change or fluctuation in the price of a single stock over a certain period. It measures how far a stock's price deviates from its average or anticipated value over a specific period. Understanding stock price volatility entails understanding the reasons that cause these changes and the ramifications for investors. Here's a thorough explanation of stock price volatility and how to interpret its fluctuations:

Causes of Stock Price Fluctuation:

❖ Economic indicators i.e GDP growth, inflation rates, employment data, and interest rates impact stock values. It can be either Positive economic indications or Negative ones may cause prices to fall.

- ❖ Company Performance refers to Revenue growth, earnings per share (EPS), profit margins, and management projections all have the potential to influence market sentiment.
- ❖ Geopolitical Events: Political instability, trade disputes, wars, and geopolitical conflicts can all produce financial market anxiety and stock price volatility. Investors may respond to geopolitical developments by altering their investment holdings to reduce risk or capitalize on opportunities.
- ❖ Behavioural finance theories, such as herd mentality and investor biases, influences stock price movement.
- ❖ Investor's irrational behaviour due to fear of loss or desire for prospective profits. Fear may cause panic selling during market downturns, but greed can drive speculative bubbles and overpriced stock prices.
- ❖ Identifying fluctuations from company's underlying worth by examining its financial statements, business model, competitive position, and growth potential.
- ❖ Not all stock price changes imply underlying problems with a firm or its fundamentals. Some variations are expected and can be attributed to market dynamics, investor mood, or technical considerations. Investors must distinguish between typical volatility and signals of underlying issues.
- ❖ Fundamental analysis assists investors in determining a by concentrating on basic variables, investors may make better-educated judgments and avoid responding rashly to short-term market swings.



IV Managing Volatility

Investors manage loss of volatility through various ways Diversification, Stop loss orders, hedging and long term investing.

Long-term investors are best advised to ignore periods of short-term volatility. This is because over the long run, stock markets tend to rise. Meanwhile, emotions like fear and greed which amplify in volatile markets can undermine your long-term strategy.

Some investors can use volatility as an opportunity to add to their portfolios by buying the dips, when prices are relatively cheap.

Hedging strategies to navigate volatility, such as buying protective puts to limit downside losses without having to sell any shares. But note that put options will also become pricier when volatility is higher.

In this study we are comparing the top performers of Information Technology Industry which is traded in NYSE and Nasdaq Stock Market (NASDAQ) the stock market data value are compared from July 2024 - December 2024. Accenture plc (ACN) is traded on the New York Stock Exchange (NYSE) & Cognizant Technology Solutions (CTSH) is traded on the Nasdaq Stock Market (NASDAQ).

This study summaries a comparison of Stock Volatility of ACN and CTSH based on Financial Performance, Sharpe Ratio, ATR and EPS.

Average True Range

Average True Range is a technical indicator that measures stock volatility over specific period of time.

True Range = max (High–Low, |High–Previous Close|, |Low–Previous Close|)

ATR is $\sum TR / n$

Sharpe Ratio

It is the ratio which measures the risk adjusted return of an investment.

$R_p - R_f / \sigma_p$ Where R_p is portfolio or stock return , R_f is Risk free Rate and σ_p S.D of Returns.

Volatility

Volatility represents deviations due to various reasons. It is measured either by Standard Deviation, Beta Value and Implied Volatility percentatge .

Financial Performance

Financial Performance is crucial in analysing the company profitability and financial health. Revenue specifies the growth indicator, EBIT specifies the measures of operating efficiency. Net profit determines company profitability.

Earnings per share

Earnings per share evaluates the per stock value highlighting the company's profitability.

IV a. Cognizant Technology Solutions Corporation (CTSH)

Cognizant Technology Solutions Corporation is an American multinational information technology services and consulting company. It is headquartered in Teaneck, New Jersey, U.S. Cognizant is part of the NASDAQ-100 and trades under CTSH. Engineering modern business to improve everyday lives, Cognizant helps to discover new ways of operating so it can anticipate and act, as if on intuition. Over the past 30 years, they've built relationships with market-leading companies around the world. Its expertise that's been proven and tested around the globe. Cognizant reaches new levels of convenience, elegance and beauty with hyper-personalized experiences that connect faster, generate growth and build brand loyalty. Its stay relevant today and ready for tomorrow with software built to learn and deploy massive processing power. It unlocked in the cloud to create value in every byte of data. As innovation ramps up at speeds and has never seen, It stays focused on helping businesses seize the latest opportunities, recapturing our place as a market leader in growth and furthering the responsible use of gen AI.

OVERALL SUMMARY OF CTSH'S PERFORMANCE METRICS AS ON 31.12.2024

Market Cap \$40.03 B	EPS \$4.53	PE Ratio 17.82	PEG Ratio 1.34	Total Revenue \$19.41B
GP \$6.15 B	EBIT \$3.50 B	Target Price \$83.81	Sharpe Ratio 4.43	

Source: Zack Ranks stock research

Average True Range of Price Movements of CTSH from July to December 2024



Source: Zack Rank System

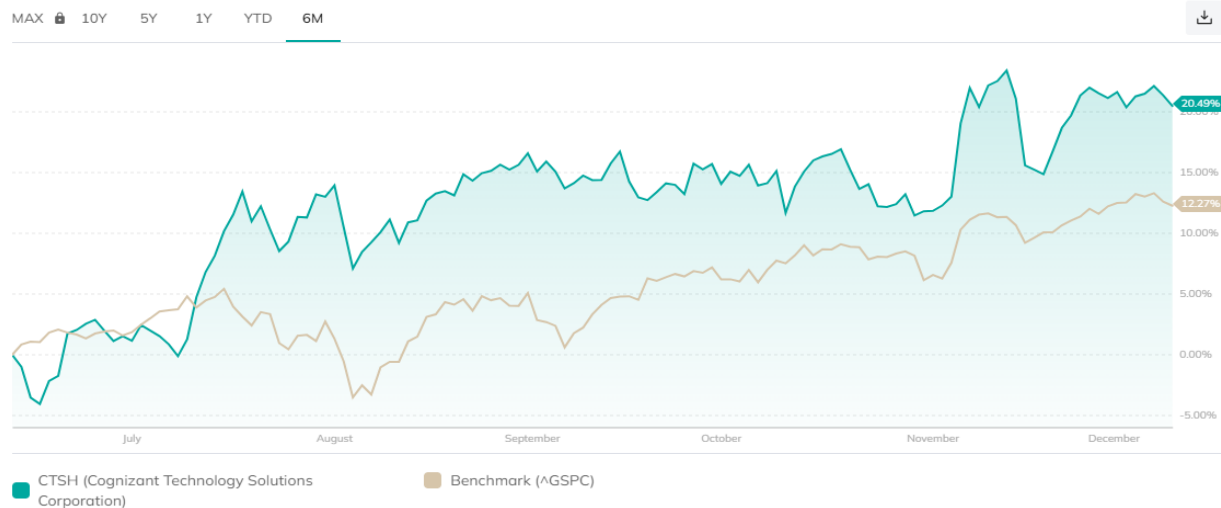
Average True Range of CTSH experiences the **upward movement**, it reflects increased demand for the stock as more investors are willing to buy it at higher prices.

- For the investors who hold it increase in the value of their investment.
- For prospective investors positive prospects but also a higher cost to enter the market.

PERFORMANCE

PERFORMANCE CHART

The chart shows the growth of an initial investment of \$10,000 in **Cognizant Technology Solutions Corporation**, comparing it to the performance of the S&P 500 index or another benchmark. All prices have been adjusted for splits and dividends.



Source: Zack Rank System

- At 20.49% CTSH highlights the positive performance which involves higher earnings, or successful business strategies can attract investors.
- Optimism about the company's future performance can lead to increase in purchase.

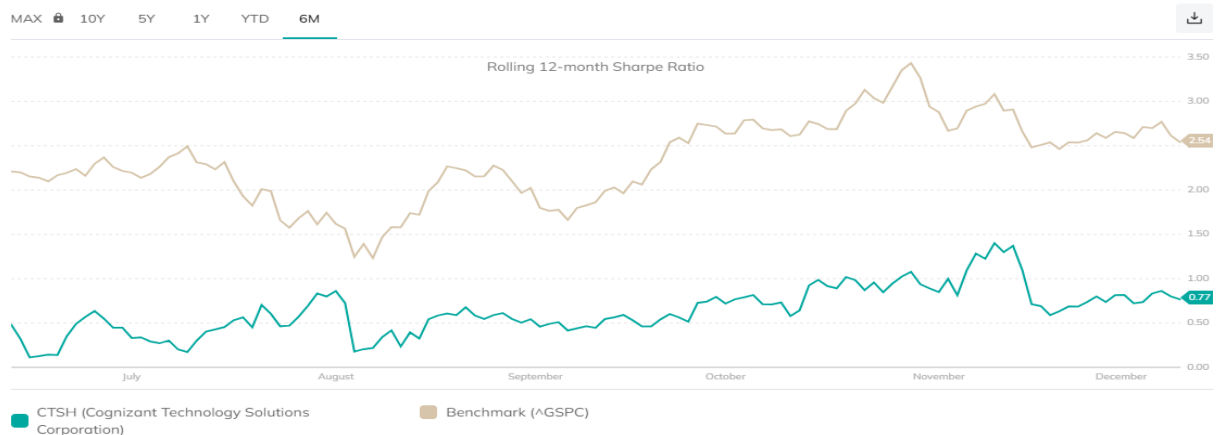
Sharpe Ratio

Sharpe ratio of CTSH Sharpe ratio is at 0.86 indicates sustainability of the company's earnings.

SHARPE RATIO

The current **Cognizant Technology Solutions Corporation** Sharpe ratio is 0.86. This value is calculated based on the past 1 year of trading data and takes into account price changes and dividends.

Use the chart below to compare the Sharpe ratio of **Cognizant Technology Solutions Corporation** with the selected benchmark, providing insights into the investment's historical performance in terms of risk-adjusted returns. Go to the [Sharpe ratio tool](#) for more fine-grained control over the calculation options.



Source: Zack Rank System

Volatility

VOLATILITY

VOLATILITY CHART

The current Cognizant Technology Solutions Corporation volatility is **6.45%**, representing the average percentage change in the investments's value, either up or down over the past month. The chart below shows the rolling one-month volatility.



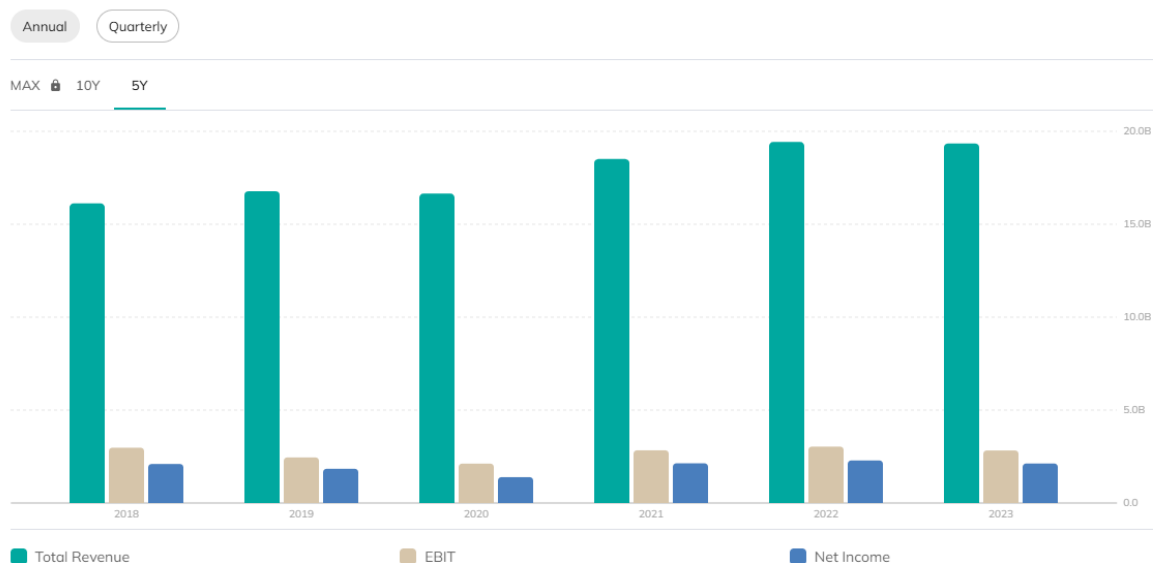
Source: Zack Rank System

The above image specifies the Beta which is 6.45 % relatively higher. **Higher volatility at 6.45% represents** Long Term investor and traders, it is an opportunity for active traders to make gains from price swings.

FINANCIALS

FINANCIAL PERFORMANCE

The chart below illustrates the trends in the financial health of Cognizant Technology Solutions Corporation over time, highlighting three key metrics: Total Revenue, Earnings Before Interest and Taxes (EBIT), and Net Income.



Source: Zack Rank System

Financial Performance

Sustained performance over years specifies that CTSH has significantly stabilise the EBIT, Revenue and Net Income.

UGC CARE Group-1

Earnings per share



Source: Zack Rank System

EPS is at 1.25 a firm financial metric indicate the firm Profitability it is revenue generated on business.

IV b. Accenture ACN plc:

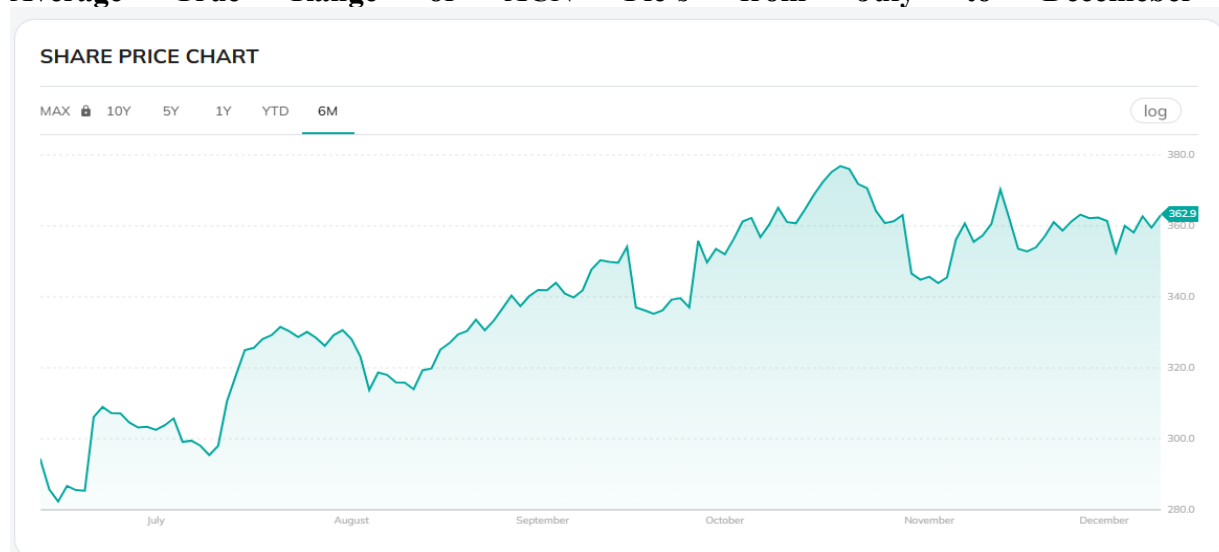
Accenture plc is a global multinational professional services company originating in the United States and headquartered in Dublin, Ireland, that specializes in information technology (IT) services and management consulting. A Fortune Global 500 company, trade in NYSE under ACN plc.

OVERALL SUMMARY OF ACN plc 'S PERFORMANCE METRICS AS ON 31.12.2024

Market Cap \$224.97B	EPS \$11.39	PE Ratio 31.44	PEG Ratio 2.25	Total Revenue \$48.67B
GP \$15.72 B	EBIT \$8.40 B	Target Price \$378.54	Sharpe Ratio 2.28	

Source: Zack Ranks stock research

Average True Range of ACN Plc's from July to Decemeber 2024



Source: Zack Rank System

In Bullish trend, when ATR rises along with the Stock Prices .It attracts more traders and positive quarterly earnings reports and growth in revenue or profit.As on December 2024 the Share Price is at 362.9\$ which is the upward trend

PERFORMANCE

PERFORMANCE CHART

The chart shows the growth of an initial investment of \$10,000 in **Accenture plc**, comparing it to the performance of the S&P 500 index or another benchmark. All prices have been adjusted for splits and dividends.



Source: Zack Rank System

Performance of ACN signifies strength in the stock market.It suggests strong investor confidence in the company.Which is above the benchmark of 12.27%

SHARPE RATIO

The current **Accenture plc** Sharpe ratio is **0.38**. This value is calculated based on the past 1 year of trading data and takes into account price changes and dividends.

Use the chart below to compare the Sharpe ratio of **Accenture plc** with the selected benchmark, providing insights into the investment's historical performance in terms of risk-adjusted returns. Go to the [Sharpe ratio tool](#) for more fine-grained control over the calculation options.



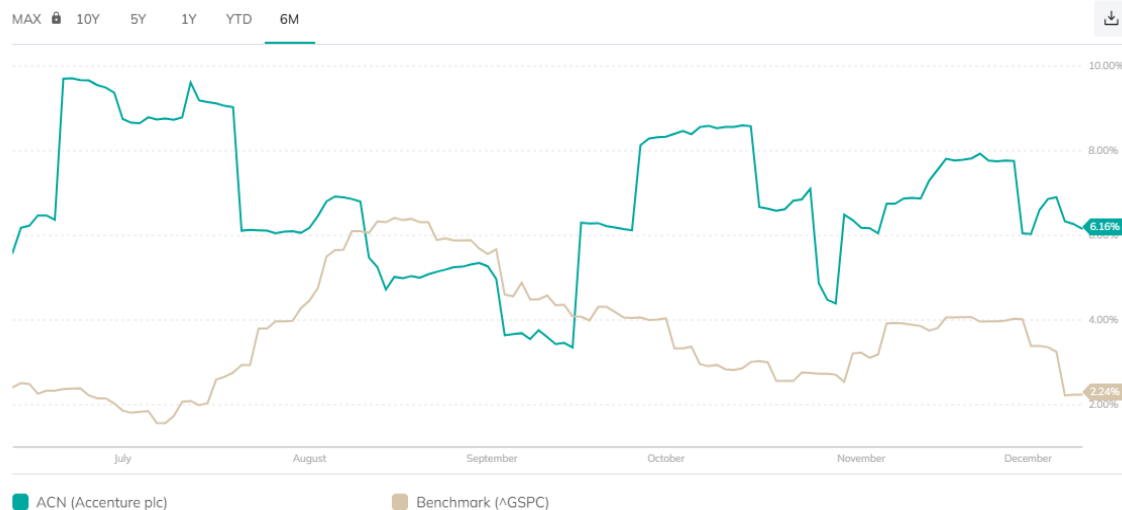
Source: Zack Rank System

Sharpe Ratio is at 0.38 S&P 500 at 2.54 achieving superior returns with lower volatility consistent performance.

VOLATILITY

VOLATILITY CHART

The current Accenture plc volatility is **6.16%**, representing the average percentage change in the investments's value, either up or down over the past month. The chart below shows the rolling one-month volatility.



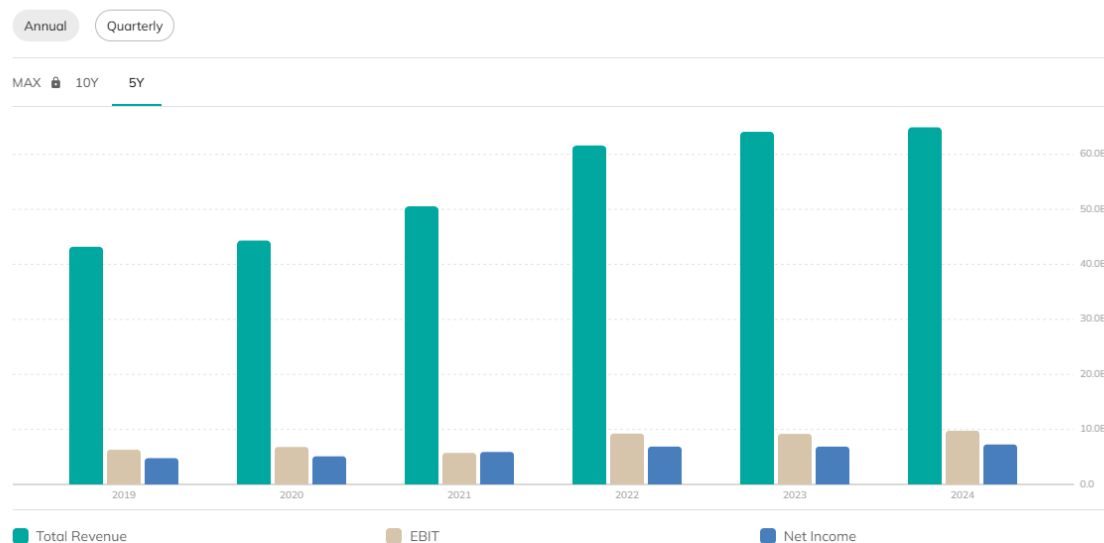
Source: Zack Rank System

Volatility is at 6.16% specifies the lower Sharpe Ratio beside nominal returns. High volatility increases the risk component , reducing its risk-adjusted return.

FINANCIALS

FINANCIAL PERFORMANCE

The chart below illustrates the trends in the financial health of Accenture plc over time, highlighting three key metrics: Total Revenue, Earnings Before Interest and Taxes (EBIT), and Net Income.



Source: Zack Rank System

Stable Revenue at \$ 60 B and EBIT \$ 10 B suggests predictable operational performance and Net Income at \$ 0.8 B specifies increase in interest and non operating cost.

EARNINGS PER SHARE

The chart presents the Earnings Per Share (EPS) performance of Accenture plc, comparing actual results with analytics estimates. The company met analyst expectations for EPS in the past quarter.



Source: Zack Rank System

EPS at 2.8 which is less than the S&P 500 lower profitability could be higher interest rates , taxes or operational inefficiencies which reduces Net Income.

V Comparative analysis of CTSH and ACN plc

PRICE CORRELATION

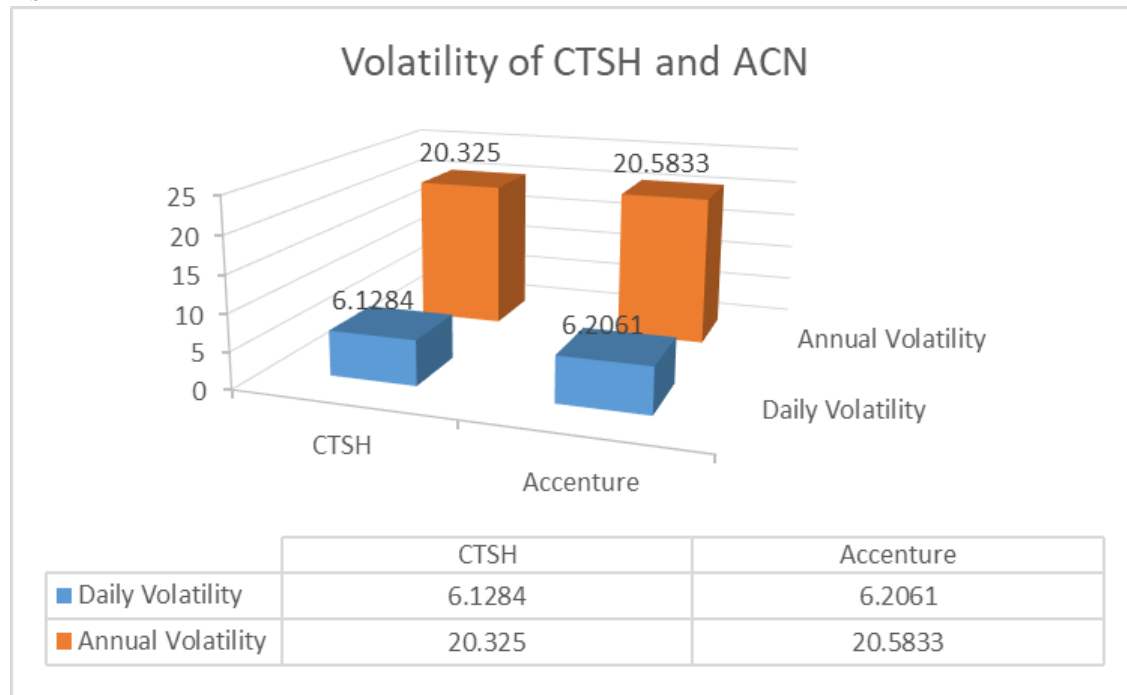
The Price correlation of CTSH and ACN is **0.50**. There is positive degree of relationship in their price movements. It can be acceptable for diversification, balance between risk and returns.

SHARPE RATIO COMPARISON

The current **CTSH** Sharpe Ratio is **0.77**, which is higher than the **ACN** Sharpe Ratio of **0.39**. The chart below compares the historical Sharpe Ratios of CTSH and ACN, offering insights into how both investments have performed under varying market conditions. These values are calculated using daily returns over the previous 12 months.



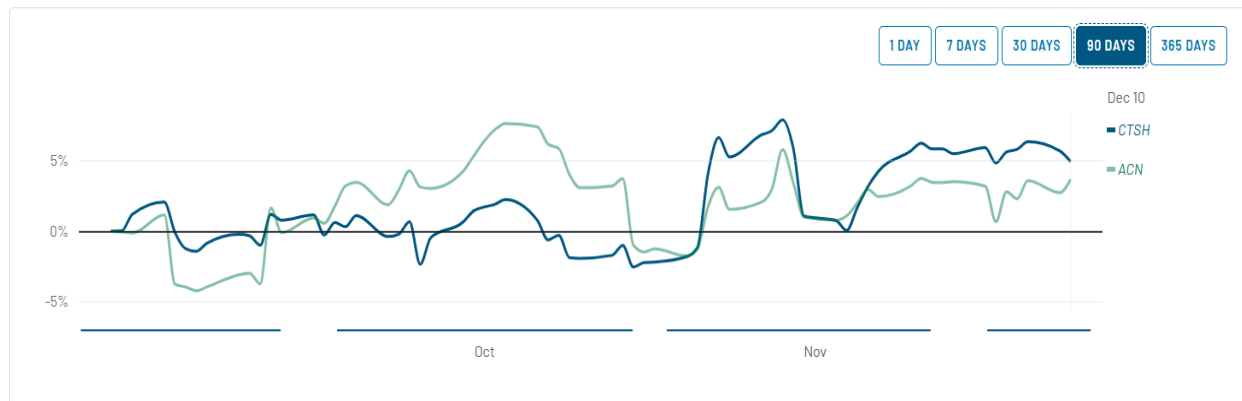
CTSH offers High risk adjusted returns 0.77 and ACN at lower 0.39 which infers high volatility and risk



In the Short-Run the investments are identical in terms of daily volatility.& Long Run differences in annual volatility (variation of 0.14) suggest that the risk levels diverge over time, and Investor must evaluate the higher-volatility option aligns with risk tolerance and investment goals.

Price Performance of CTSH and ACN plc

Comparative Price Performance Over Time



Source: Zack Rank System

Price Performane CTSH outperforms ACN plc symbolises strong growth potential and may be attractive for investors seeking higher returns in this period. Price determines fundamentals and market conditions for future investment decisions.

Compare Stocks - Price & Volume

COMPANY	CURRENT PRICE	50-DAY MOVING AVERAGE	52-WEEK RANGE	MARKET CAP	BETA	AVG. VOLUME	TODAY'S VOLUME
ACN Accenture	\$363.85 +0.3%	\$360.48	\$278.69 \$387.51	\$227.47B	1.24	2.69 million shs	1.54 million shs
CTSH Cognizant Technology Solutions	\$81.25 +1.5%	\$78.02	\$63.79 \$82.41	\$40.29B	1.06	3.76 million shs	2.15 million shs

Source: Zack Rank System

CTSH higher stability and balanced growth with moderate risk.

ACN higher retruns with trade off with increased volatility and risk.

VI Findings

ACN is traded at higher profit earnings since it focuses on expanding globally and strong stock performance. Whereas **CTSH** is slower and cheaper

ACN is slightly more volatile due to higher ATR and β . Whereas **CTSH** is more stable.

ACN is global leader with higher growth and strong financials where as **CTSH** lower volatility and stable dividends.

ACN receives positive analyst attention with increased price targets reflecting confidence in its performance despite stock volatility.

VII Suggestion

The Companies must focus on the Financial Metrics exploring strategies to enhance profitability

- Reduce Cost Optimization (i.e operating or interest costs) to improve net income.
- Research and invest on new markets and product innovation.
- Buy back shares to improve EPS.
- To manage Risk investment with lower annual volatility and stability for long-term portfolios.
- Annualized returns of both investments justify by better performance.
- Reinvest strategies are effective based on Consistent revenue, EBIT, and Net Income are positive, but lack of growth is a concern.

VIII Final Recommendation:

Strategies are framed based on Investor Investment i.e volatility and risk. Conservative investors prefer stable and moderate risk exposure.

In-depth Analysis of the various market trends and frame strategies.

Periodically Companies positions are reassessed at par with the changes in Geopolitical and market changes.

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