Relationship Between Infrastructure Sector and Financial Services Sector:

Evidence From India

Dissertation Submitted to

Goa University

Project Work and FSC413

Credits: 4

Submitted in partial fulfilment of Master's Degree

MBA (Financial Services)

Semester IV

By

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DECLARATION BY STUDENT

I hereby declare that the data presented in this Dissertation report entitled, "Relationship Between Infrastructure Sector and Financial Services Sector: Evidence From India" is based on the results of investigations carried out by me in the MBA (Financial Services) at the Goa Business School, Goa University under the Mentorship of Dr Narayan Parab and the same has not been submitted elsewhere for the award of a degree or diploma by me. Further, I understand that Goa University or its authorities will be not be responsible for the correctness of observations / experimental or other findings given the dissertation.

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COMPLETION CERTIFICATE

This is to certify that the dissertation report "Relationship Between Nifty Infrastructure Sector and Nifty Financial Services Sector: Evidence From India" is a bonafide work carried out by Dr. Narayan Parab under my supervision/mentorship in partial fulfilment of the requirements for the award of the degree of MBA (Financial Services) in the Discipline Department of Commerce at the Goa Business School, Goa University.

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CHAPTER I: INTRODUCTION

1.1 Introduction

NSE have delivered for the primary time in India, the absolutely automated screen-primarily based trading. It uses the modern absolutely automatic trading device designed to provide the investors throughout the country a secure and the smooth way to invest. The Nifty Financial Services sector is the important a part of an Indian stock market, comprising of the comprising of the companies that is providing financial products and the services consisting of the banking, insurance, and the asset management. And the Nifty Infrastructure sector is the important sector of Indian stock market that is including the groups which are involved in improvement and the preservation of the essential infrastructure consisting of the roads, airports, electricity plant life and ports. The Nifty Financial Services offerings perform a very critical position inside the financial system, because it providing the necessary Financial Infrastructure for agencies and the individuals to manage their finances and the investments. And the Nifty Infrastructure sector additionally plays a important role in economic growth of country through offering the critical infrastructure to guide the industries and the organizations. Nifty Financial Services sector and Nifty Infrastructure sector started to change on automated trading platform on 2nd January 2004 at 1000 points and currently on 31st March 2023 the Nifty Financial Services sector is trading at 18,058.70 and Nifty Infrastructure sector is trading at 5090.95. Some of major players in Nifty Financial Services sector includes the HDFC Bank, State Bank of India, Bajaj Finserv and ICICI Bank and amongst others players. And the main companies of Nifty Infrastructure sector include the Larsen & Turbo, Bharat Heavy Electricals limited, Power Grid Corporation of India and NTPC Limited and among others.

The Nifty Financial Services sector is watched by using the investors and the trades as it's reflecting the overall performance of the sector and it is able to offer a exceptionally valuable as insights into a broader markets trend. And Nifty Infrastructure sector is likewise an important benchmark for the investors and the buyers who are interested in this sector. The Indian government's attention on the infrastructure development, So the Nifty Infrastructure sector poised for the tremendous increase in the coming years and also it's going to assist the Nifty Financial Services sector return.

1.2: Literature Review

Joshi (2011) examined that own volatility spillover is higher than cross-marketplace spillover. Wherein within the implication of weak integration is that investors will benefit from reduction of diversifiable risk at the same time as Shaikh (2019) examined that the presidential elections in 2012/2016 do comprise the critical market. The fact that investor issues were higher earlier than the Election day. Empirical estimates significant courting with investor's sentiment and stock market performance. Munir, Sukor, and Shaharuddin (2022) in look at to have a look at the presence of the Adaptive market speculation (AMH) in South Asian rising stock markets. Therefore, contrarian profits regularly exist, and chronic vulnerable-shape market inefficiencies succeed in those markets. As Afzal, Haiying, Afzal, Mahmood, and Ikram (2021) tested that have a look at is useful to the stockbrokers and investors to understand the actual conduct of shares in dynamic markets. ultimately, the consequences can also offer better insights into forecasting VaR even as thinking about the mixed correlational impact of all shares. Naik and Reddy (2021) examined the global financial crisis of 2008. The emerging markets by means of considering the multidimensional great of market liquidity. The inter-linkages between the liquidity of emerging markets with that of the worldwide stock markets can be in addition evaluated. And Palamalai, Kalaivani M. and Devakumar (2013) examined that this look at examines the inventory market integration of rising Asia-Pacific economies. The study consequences endorse that despite the fact that long-time period diversification advantages from publicity to those markets is probably limited, brief-run blessings may exist because of significant transitory fluctuations.

1.2.1 Study of Covid-19 pandemic:

Ganie ,Wani and Yadav (2022) tested that impact of COVID-19 on stock markets in the pinnacle affected international locations. The results exhibits that Brazilian stock indices show the highest declineduring the pandemic, while Mexican indices show the bottom fall throughout the equal length. even as Mishra and Mishra (2020) examined The consequential surprising occurrence of economies to trim down their increase prospects. Such growth in the range of COVID-19 showed instances, adjustments in oil prices, and trade quotes had been observed to be widespread in channelizing the fears and uncertainties of coronavirus pandemic to cause unexpected nosedives in Asian inventory markets. The Bharti and Kumar (2022) tested the impact of cross-section of quantile regression for the constituent organizations. We in addition suggest that during exogenous events, investors

want to realign their portfolios and formulate buying and selling strategies for better chancereturn management. While **Mishra and Mishra (2021)** this take a look at tested the herding conduct of banking and financial offerings sectors listed in the National Stock Exchange. So, the study suggests removing information asymmetry among the marketplace participants and devising coverage initiatives for ensuring marketplace balance. And however **Das and Rout** (**2020**) examined This piece of labour attempted to study the five main countries and evaluating the threat with different durations of disaster viz. Worldwide economic crisis of 2007-2008. The findings of this paper will assist the traders in understanding the fast-run dynamics of the stock markets and use such facts in destiny for funding in similar circumstances.

Kumar and Gupta (2022) examined that take a look at unearths that amongst all of the BRICS international locations. The have a look at offers treasured insights to policymakers who want to be more vigilant approximately the financial crisis and spill over among the nations. And **Mishra and Mishra (2020)** examined the volatility clustering often came about, because of the pessimistic and panic sentiments of traders, and the boom inside the number of COVID-19 showed instances, adjustments in oil expenses, and trade quotes had been found to be large in channelizing the fears and uncertainties of coronavirus pandemic to purpose sudden nosedives in Asian inventory markets.

1.2.2 Study of Stock, Sector, Index Volatility

Thakolsri, Sethapramote, and Jiranyakul (2016) tested that this article investigates the impacts of changes in the U.S.-implied volatility. The findings within the gift article supply latest expertise for portfolio managers because they need to know the diploma of dependency across stock markets for you to diversify more correctly. while Aziz, Sadhwani, Habibah, and Janabi (2020) examined this is have a look at additionally reveals that there's neither mean spillover nor volatility spillover among gold and equity marketplace; therefore, investor can spend money on fairness and gold to diversify threat of portfolio. And Emenike and Enock (2020) tested that this have a look at how news impacts inventory market go back volatility. An important implication of our results is that traders, analysts, brokers and dealers should take conscious to the nature of news filtering into stock market as such information would possibly improve their anticipated volatility forecast.

Nandy and Chattopadhyay (2017) examined that effect of the introduction of by-product buying and selling in person shares listed in NSE. We find no tremendous sectoral variations

even as analyzing the effect of derivatives trading on return volatilities of stocks representing different sectors of the Indian economy. **Majumder and Nag (2017)** examined that Volatility spillover changed into found to be bidirectional the various two pro-cyclical sectors: Finance and IT. To the first-rate of our know-how, this is the first look at on Indian stock market which has analysed the dynamics of shock and volatility transmission across quarter indices.

1.2.3 Study of Financial Services Sector:

Dong and Sing (2020) tested that traders within the less transparent property and monetary service region are determined to over react on marketplace shocks, in addition destabilizing the marketplace. The findings suggest that regulatory measures that growth the level of transparency may want to aid the stabilization of markets.

Khatun (2019) for instance, Rajan and Zingales (2003) argued that alternate openness promotes financial improvement as incumbent companies or companies do now not get any incentives to block monetary improvement on the way to reduce access and opposition. Moreover, change openness creates incentives for them to adopt a exceptional stance toward such development. As a result, exchange openness promotes economic improvement. A comparable view is shared by means of Braun and Raddatz (2005), who in addition explored the effect of trade on finance thru the political channel. They validated that exchange liberalization reduces the strength of politicians in blocking financial improvement, thereby improving the development of the financial system. Economic improvement also has a substantial impact on economic inclusion. In this context, Mani (2016) measured the financial inclusion in South Asian countries, and she has found that situation of financial inclusion in South Asia is inconspicuous in comparison to other regions in the world. It's further argued that the usage of banking offerings, use of debit and credit cards, financial institution-borrowing and deposit of savings is at low tiers. therefore, in view of this studies, beginning of change in financial offerings not most effective influences the monetary development positively however also will play a greater function in monetary inclusion within the usa. in the context of monetary improvement and trade openness, few latest research predicts that there may be each short- and long-run effect on financial development because of trade openness. for instance, Ho and Iyke (2018) studied the short- and long-run effect of exchange openness on financial improvement for a panel of 43subSaharan African nations over the duration of 1996–2014. They found that in the long run, change openness has superb influences on financial improvement. But, inside the quick run, impact of openness isn't always clean and seems to be bad. Similarly, researchers have additionally found the coexistence of lengthy-run and bad short-run courting between economic improvement and exchange openness (**Kim, Lin, & Suen, 2010; Loayza&Ranciere, 2006**)

Chauhan (2020) tested that Microfinance establishments (MFIs) gives financial savings, credit score, coverage and remittance facilities to more impoverished humans without any collateral. The present paper offers requirements for overall performance measures of NGO–MFIs operating in India to assist in enhancing the performance and growth of microfinance corporations.

1.2.4 Study of Infrastructure Sector:

Hasnat (2020) examined that the growing financing requirements coupled with tightening of fiscal purse strings point to the pertinence of marketplace-primarily based finance for infrastructure provision and enhancement. The have a look at assesses the threat-return and volatility profile of Nifty Infra, the countrywide stock exchange (NSE) sector index for the 30 largest infrastructure corporations in India vis-à-vis the broader Nifty 50 for the term 2010–2018. This shows the want for state-triggered measures to prop up liquidity in fairness trade for infrastructure companies. This will not best decorate the chance-go back profile however additionally mitigate excessive volatility for these heavily leveraged corporations.

Kudtarkar (2021) tested that bodily infrastructure like roads and airports and social infrastructure like faculties and hospitals are essential for economic growth and form the idea of supplying a better standard of dwelling for the citizen of the usa. The governments worldwide build infrastructure through budgetary provisions, but many governments in growing nations which are not in a financial position to fulfill gigantic spending requirement build infrastructure through partnership with private companions and the PPP (**Ross &Bettignies, 2004**). The authorities builds value-effective infrastructure in collaboration with the non-public developers in PPP modality the use of undertaking control know-how of private builders without raising authorities debt or imposing taxes on residents (**Chan et al., 2011**). the unfinished agreement concept is mentioned in detail by using **Grossman and Hart (1986)and Hart and Moore (1990)** suggesting giving assets ownership proper to the private investing birthday celebration to incentivise them to put money into public infrastructure tasks and in addition protect the investor appropriation from the authority's authority and encourages innovation to lessen life cycle value of the venture. The allocation of two or extra activities of a undertaking to a non-public companion known as as 'bundling' induces the

non-public developer to use extra cost-powerful and innovative designs lowering the project existence cycle cost and beautify returns to personal partner (Daniels & Trebilcock, 2000). A PPP task requires a technically professional and financially sound private developer with adequate technical knowhow, capable assignment group, effective undertaking organisation shape and beyond enjoy in executing infrastructure projects and public authorities must select a equipped personal accomplice in procurement degree to make certain completion of undertaking on time and within assigned finances (Dada &Oladokun, 2012). A threat is an uncertainty approximately destiny final results, and risk control is bunch of activities and measures to address risks to manipulate the mission (PMBOK, 1996). A hazard allocation and management is essential for PPP project management (Irwin, 2007), and chance allocation among the initiatives companions even as growing maximum value need to carefully manipulate troubles like negative choice, moral risk and assignment preserve up bobbing up because of incomplete nature of PPP contracts and should be allotted to a associate who can manipulate and mitigate it with the aid of aligning hobbies of all involved stakeholders and meticulously drafting the CA considering that PPP is largely an incomplete contract. The time and fee overrun lowers the benefit and destroy the monetary value of the challenge. The bad results of character PPP initiatives due to negative agreement and chance management result into terrible economic welfare (Ansar et al., 2016).

1.3: Research Gap

The research conducted in the past dealt with the individual stock derivatives and spot market volatility. But no study was conducted to find the causality and impact of Nifty Financial Services sector and Nifty Infrastructure sector. Also, the researchers did not take into consideration a 20-year study period.

1.4: Scope of the Study

The scope of the study is to examine the impact and causality among the variable under observe specifically Nifty Infrastructure and Nifty financial services sector. The consequences help in reading the effect of Nifty Infrastructure on Nifty financial services sector and the effect of Nifty financial offerings on Nifty Infrastructure sector. And additionally, a examine the causality between these Nifty Infrastructure and Nifty financial services area.

1.5 Objectives of the study

1.5.1: To examine the impact of Nifty Financial Services sector return on Nifty Infrastructure sector return.

1.5.2: To examine the impact of Nifty Infrastructure sector return on Nifty Financial Services sector return.

1.5.3 To analyze causality among Nifty Infrastructure and Nifty Financial Services sector.

1.6 Research Methodology

The study is based on relationship between Nifty Infrastructure and Nifty Financial Services. Nifty Financial Services sector comprising of the businesses that presenting the financial services and products such as banking, insurance, and asset management. And a few essential gamers in monetary services area are HDFC bank, State Bank of India, Bajaj Finserv and ICICI Bank among others. The Nifty Infrastructure sector is prime segment this is inclusive of businesses of development and renovation of the important infrastructure inclusive of ports, roads, airports and power plants. And some main in Nifty Infrastructure sectors are Larsen & turbo, Bharat Heavy Electricals Limited, Power Grid Corporation of India and NTPC and others. Secondary information was used for this purpose. Statistics turned into accumulated on daily basis from 02-01-2004 until 31-03-2023 the usage of the NSE internet site as the source of data series. The information consists of returns of Nifty Infrastructure and Nifty Financial Services at the side of their respective charges. The purpose of study is to find out the trends, relationship, impact and causality and among, techniques including Graphical evaluation, summary information in inventory marketplace return: evidence from Nifty Infrastructure and Nifty Financial Services sector.

Introduction Statistics, Correlation analysis, Unit Root (ADF) test, Regression, Ganger Causality testing method are used. The software program used to evaluation the facts is E-views and MS-Excel.

Interpretations could be as follows:

Means measures the performance of the information and may be interpreted as the very best value being the high-quality cost. Standard deviation measures the variability of the data, and hence we say lower the variation better is the result. Skewness measures the symmetry of the data. If β =0 the data is stated to be symmetry, if $\beta > 0$ it's said to be positively skewed and if $\beta < 0$ it's said to be negatively skewed. Kurtosis talks about flatness of the curve. It may be in comparison to the values of either 0 or 3. If $\beta = 0$ or $\beta = 3$ it's known as MesoKurtic,If $\beta < 0$ or $\beta < 3$ it is called as Platy Kurtic and If $\beta >$ zero or $\beta > 3$ it's miles referred to as LeptoKurtic. For ADF test, Correlation analysis, Ganger Causality test and OLS test if P value <0.01 at 1% level Of significance, <0.05 at 5% level of significance or <0.10 at 10% Level of Significance, We reject the null Hypothesis.

Regression model equation

$Yi=f(Xi,\beta) + ei$

In this Regression equation model Yi is dependent variable, f is function, Xi is independent variable, β is unknown parameters and ei is error terms.

The Breusch-Godfrey test is test for correlation in errors in a regression model. It make use of residuals from a model being consider in regression analysis and test statistic is derived from these. The null hypothesis is that there is no serial correlation of any order up to the p.

$$Yt = \beta 1 + \beta 2Xt1 + ut$$

Pairwise Granger causality test

Pairwise Granger causality test is a test statistical hypothesis test for the determining whether one time series is the useful in forecasting another.

1.7: Hypotheses Development

1.7.1: For Correlation analysis

Ho: There's no statistically significant correlation between Nifty financial services and Nifty Infrastructure.

Ha: There is statistically significant correlation between Nifty Financial Services and Nifty Infrastructure.

1.7.2: For ADF Test

Ho: Nifty Financial Services returns have unit root.

Ho: Nifty Infrastructure returns have unit root.

1.7.3: For Regression analysis

Ho: there is no statistically significant relationship among Nifty Financial Services and Nifty Infrastructure.

Ha: there's statistically significant relationship between Nifty Financial Services and Nifty Infrastructure.

Ho: there's no statistically significant relationship among Nifty Infrastructure and Nifty Financial Services.

Ha: there is a statistically significant between Nifty Infrastructure and Nifty Financial Services

1.7.4: Breusch-Godfrey Serial Correlation LM

Ho: There is no significant serial correlation between the residuals of a version and the lagged values of the residuals.

Ha: There is a significant serial correlation between the residuals of a model and the lagged values of the residuals.

1.7.5: Pairwise Granger Causality tests

Ho: There's no bi-directional Granger-causal relationship among Nifty Infrastructure return and Nifty Financial Services returns.

Ha: There's bi-directional Granger-causal relationship among Nifty Infrastructure returns and Nifty Financial Services returns.

Ho: There's no bi-directional Granger-causal relationship among Nifty Financial Services returns and Nifty Infrastructure returns.

Ha: There may be a bi-directional Granger-causal relationship among Nifty Financial Services returns and Nifty Infrastructure returns.

1.8: Limitation of the study

In an effort to preserve continuity of the information a few missing observations have been deleted. While there are other factors and countries which will be used for the study purpose, this study focuses handiest on the financial market returns in India.

1.9: Chaptalization of report

CHAPTER I emphasizes on introduction, literature review, research gap, scope of the study, objectives of the study, research methodology, limitation of the study.

CHAPTER II, Descriptive statistic, Augmented Dickey Faller (Unit Root), Correlation, Regression, Breush-Godfrey Serial Correlation, Pairwise Ganger Causality analyses study.

CHAPTER III summarizes the findings based on which necessary conclusions are drawn.

CHAPTER II: ANALYSIS AND DISCUSSION

2.1 Graphical Analysis of Trends in Nifty Infrastructure and Nifty Financial Services Sector

Figure 1: Trends in Nifty Infrastructure and Nifty Financial Services Sector.



Source: Authors Compilation

The above figure shows the trends of Nifty Infrastructure sector and Nifty Financial Services sector.

The above table indicates the actions of Nifty Financial Services sector and Nifty Infrastructure sector. From 02/01/2004 the each sector until 2005 turned into growing symentiously and soon after that Nifty Infrastructure started out to upward push and Nifty Financial Services changed into performing below it. In round 2007 Nifty Infrastructure have touched almost 6000 and Nifty Financial Services around 4200. In 2008 each the sector got here all the way down to around 2500 and from that moment onwards Nifty Financial Services started out to upward push greater than Nifty Infrastructure. From 2010 to 2020 Nifty Financial Services had grown from 4000 to 15000 and Nifty Infrastructure became around 4000 from 2010 to 2020. In 2020 market was crashed because of Covid-19 and Nifty

Financial Services fall from 15000 to 8000 and Nifty Infrastructure fall from 3800 to 2500. And that fall slowly it get recovered and each the sector have proven tons higher returns than earlier than the crash. Now currently on 31/03/2023 Nifty financial provider is trading around 18050 and Nifty Infrastructure is around 5090.

2.2 Graphical Trends in Nifty Infrastructure sector closing price



Figure 2: Trends in Nifty Infrastructure sector closing prices:

Source: Authors Compilation

The above figure shows the trends of Nifty infrastructure sector returns.

The graph above Nifty Infrastructure go back on y-axis it could be seen the return percent and on x-axis it can be visible years. From 2004 to 2008 it can be seen that during round 2004 return have went to +10% to -15%, around 2006 return changed into round +6% and -6.5%. In 2007 ending quarter go back turned into around +8% to -12%. And around in 2008 to 2009 go back become around +18% to -14%. From 2010 to 2019 it may see that returns have been round +7% to -6%. And in 2020 it could been visible big fall in returns that is around -13% and rise return is +7%. From 2020 to 2023 go back changed into around 4% to -6%.

2.3 Graphical Trends in Nifty Financial Services sector closing price



Figure 3: Trends in Nifty Financial Services sector prices:

Source: Authors Compilation

The above figure shows the trends of Nifty Financial Services sector returns.

The graph above indicates Nifty Financial Services sector provider go back on y-axis it may be seen the return percentage and on x-axis it could be visible years. From 2004 to 2008 it is able to be seen that in around 2004 return have went to +12.5% to -14%, round 2006 return changed around +6% and -6.5%. And around in 2008 to 2009 return was around +18% to -13%. From 2010 to 2019 it could see that returns were around +7% to -6%. And in 2020 it ca been seen big fall in returns that is around -18% and recovered to +9%. From 2020 to 2023 it was around +7% to -6%.

2.4: Descriptive Statistics

Table 1: Results of Descriptive Statistics

	NIFTY FINANCIAL SERVICE RETURN	NIFTY INFRASTRUCTURE RETURN
Mean	0.060536	0.034047
Median	0.095474	0.100894
Maximum	17.80685	17.52382
Minimum	-17.36226	-15.02145
Std. Dev.	1.789054	1.629794
Skewness	-0313639	-0.406423
Kurtosis	11.93381	13.192
Observations	4780	4870

Source: Author's Compilation

As we will see the above table Descriptive Statistics table of Nifty sector that is Nifty Financial Services sector returns and Nifty Infrastructure sector returns.

Here we can see that Mean value of Nifty Financial Services return is 0.060536 whereas Nifty Infrastructure return is 0.034047 which means that Nifty Infrastructure returns is lower. Therefore, we can say that Nifty Financial services returns is better than Nifty Infrastructure return and we should accept Nifty Financial Services returns since mean describes the central value it is systematic positively skewed distribution of data. And therefore, it is normally distributed.

While median of Nifty Financial Services return is 0.095474 and Nifty Infrastructure return is 0.100894 based on the series observations that is 4780. Therefore we can say that the smallest median is of Nifty Infrastructure sector returns whereas largest median is Nifty Financial Services sector returns.

As we can see that the maximum value of Nifty Financial Services returns is 17.80685 whereas for Nifty Infrastructure return is 17.52382. Therefore Nifty Financial Services sector return has the maximum value in the series of current sample.

While Nifty Financial Services sector return the minimum value is -17.36226 and Nifty Infrastructure sector return the minimum value is -15.02145 while both the series of the

current sample the minimum values are in negative form. Therefore, Nifty Infrastructure sector returns has the minimum value in the series of current sample.

Standard Deviation in descriptive statistics measures the dispersion or spread in the series. Nifty Financial Services return standard deviation is 1.789054 and Nifty Infrastructure sector return is 1.629794. Nifty Infrastructure sector return has a low standard deviation which means data are clustered around the mean, and Nifty Financial Services return standard deviation is high which indicates data are more spread out. Therefore, lower the better.

Skewness measures the asymmetry of distribution of the series around its mean. The skewness for Nifty Infrastructure sector return is -0.40623 which means that the left tail is longer and hence it is a negatively skewed distribution for which mean < median < mode. On the other hand, the skewness for Nifty Financial Services sector return is -0.313639 which state that the left tail is longer and hence it is negatively skewed distribution for mean < median < media

Kurtosis measures the peakeness that is tallness or flatness of distribution of the series. The Kurtosis for Nifty Infrastructure sector returns is 13.192 this means kurtosis > 0, there are high frequencies in only small part of the curve that is, the curve peakeness is high and thin and this is called as Leptokurtic. On the other hand, the kurtosis for Nifty Financial Services sector return is 11.93381 which is greater than 0. Therefore, there are high frequencies in only small part of the curve peakeness is high and thin and this is called as Leptokurtic.

2.5: AUGMENTED DICKEY-FULLER TEST

Table 2: Results of Augmented Dickey-Fuller test

UNIT ROOT TEST (ADF)		
	t-Statistics	Prob.*
Nifty Financial Services Return	-48.8995	0.0001
Nifty Infrastructure Return	-64.5203	0.0001

Sources: Author's Compilation

The above table shows the results of Augmented Dickey-Filler test of Nifty Infrastructure sector returns and Nifty Financial Services sector returns.

This table indicates the effects of the Augmented Dickey-Fuller (ADF) test, is a generally used statistical test for checking the presence of a unit root in a time collection. A unit root refers to a function of a time collection that indicates that the collection is non-stationary, which means that it does no longer have a steady imply and variance over time.

The table suggests the t-Statistics and Prob.* for the ADF check carried out to two variables: Nifty Financial Services sector return and Nifty Infrastructure return. The t-statistic measures how many general deviations the predicted coefficient is faraway from 0, and the chance (Prob.*) is the p-value related to the null hypothesis of a unit root inside the time collection.

The results display that both variables have a t-statistic this is particularly negative, with values of -48.8995 for Nifty Financial Services return and -64.5203 for Nifty Infrastructure return. The related probabilities (p-values) are very small, with values of 0.0001 for both variables. This shows that the null hypothesis of a unit root is strongly rejected, and that both Nifty Financial Services return and Nifty Infrastructure return are stationary time series.

2.6: Correlation

Table 3: Results of Correlation

Included Observation: 4780

Correlation

Probability	Nifty Financial Service Return	Nifty Infrastructure Return
Nifty Financial Services Return	1	
Nifty Infrastructure Return	0.812931	1
	0	

Source: Author's Compilation

The above table shows the results of Correlation test of Nifty Infrastructure sector returns and Nifty Financial Services sector returns.

This table shows the correlation between Nifty Financial Services Return and Nifty Infrastructure Return. Correlation is a statistical measure that indicates the strength and direction of the linear relationship between two variables. The correlation coefficient ranges from -1 to 1, where a value of 1 indicates a perfect positive correlation, a value of -1 indicates a perfect negative correlation, and a value of 0 indicates no correlation.

The table shows that the correlation between Nifty Financial Services Return and Nifty Infrastructure Return is 0.812931. This suggests a strong positive linear relationship between these two variables, indicating that when one variable increases, the other variable is likely to increase as well.

The table also reports the probability associated with the correlation coefficient, which is shown as "0" in the second row and second column. This probability value indicates the likelihood of observing the given correlation coefficient if there were no correlation between the two variables in the population. In this case, the probability value of 0 indicates that the observed correlation coefficient is statistically significant at the standard significance level of 0.05, meaning that the strong correlation between Nifty Financial Services Return and Nifty Infrastructure Return.

Overall, the table suggests that there is a strong positive correlation between Nifty Financial Services Return and Nifty Infrastructure Return, which could imply that changes in one variable may be associated with changes in the other variable. However, correlation does not necessarily imply causation, and further analysis is needed to establish the direction and causal relationship between these two variables.

2.7: Regression

Table 4: Results of RegressionDependent Variable: Nifty Financial Services

Variable	Coefficient	Std. Error	t-Statistic	Prob.
С	0.030313	0.01371	2.210986	0.0271
NIFTY INFRASTRUCTURERETURN	0.88879	0.009255	96.03179	0
AR(1)	0.673691	0.127529	5.282643	0
AR(2)	-0.084385	0.014462	-5.83496	0
MA(1)	-0.625316	0.127646	-4.89882	0

Source: Author's Compilation

The above table shows the results of Regression test and dependent variable is Nifty Financial Services sector returns.

This table shows the consequences of a regression analysis with the established variable being Nifty Financial Services and numerous unbiased variables. Here's a breakdown of each variable:

C: that is the intercept or constant term inside the regression equation. The coefficient of 0.030313 manner that after all different impartial variables are 0, the anticipated price of the established variable Nifty Financial Services is 0.030313.

Nifty Infrastructure return: that is an impartial variable and has a coefficient of 0.88879. which means a one-unit growth in Nifty Infrastructure return to an expected growth of 0.88879 units inside the based variable, retaining all different variables constant. The standard mistakes of 0.009255 indicates the precision of the estimate, and the t-statistic of 96.03179 indicates that this coefficient strongly statistically significant.

AR(1) and AR(2): those are autoregressive phrases that capture the dependence of the dependent variable on its beyond values. AR(1) has a coefficient of 0.673691, indicating that a one-unit growth within the lagged value of the dependent variable leads to an a increase of 0.673691 units within the contemporary cost, holding all other variables steady. AR(2) has a poor coefficient (-0.084385), suggesting that a one-unit increase inside the value two periods ago results in a lower of 0.084385 units in the modern price, maintaining all different variables steady. The standard errors of these coefficients 0.127529 and 0.014462 are

enormously small in comparison to the coefficients, indicating that these estimates are noticeably precise. Both of these coefficients are also strongly statically significant.

2.8: Breusch-Godfrey Serial Correlation LM Test

F-Statistic	0.517435	Prob.F(1,4774)	0.472
Obs*R-squared	0.518011	Prob. Chi-Square(1)	0.4717

Table 5: Results of Breush-Godfrey Serial Correlation LM Test

Source: Author's Compilation

The above table shows the results of Breusch-Godfrey Serial Correlation LM test of Nifty Infrastructure sector returns and Nifty Financial Services sector returns.

This table reviews the outcomes of the Breusch-Godfrey Serial Correlation LM test, that's a statistical test used to discover the presence of autocorrelation (serial correlation) inside the residuals of a regression model. The test is to check if there's a relationship between the residuals of a model and the lagged values of the residuals.

The table reviews two test statistics: the F-statistic and the Obs*R-squared statistic. The Fstatistic is 0.517435 and its related probability, Prob.F(1,4774), is 0.472. This indicates that there may be no serial correlation in the residuals of the regression version, because the pvalue is more than the standard significance level of 0.05. In different phrases, we cannot reject the null hypothesis that there may be no serial correlation within the residuals.

The Obs*R-squared statistic is 0.518011, and its related chance, Prob. Chi-square(1), is 0.4717. This statistic is used to check for better-order serial correlation within the residuals. The p-value is greater than significance degree of 0.05, indicating that we cannot reject the null hypothesis of no higher-order serial correlation in the residuals.

Basic, these effects suggest that there's no big proof of serial correlation in the residuals of the regression model. Therefore, the model is a great in shape for the records, and the estimates of the regression coefficients are dependable.

2.9: Regression

Table 6: Results of Regression

Dependent Variable: Nifty Infrastructure Return

Variable	Coefficient	Std. Error	t-Statistic	Prob.
С	-0.010784	0.013737	-0.784978	0.4325
Nifty Financial Services Return	0.740564	0.007675	96.49067	0

Source: Author's Compilation

The above table shows the results of Regression test and the dependent variable is Nifty Infrastructure sector returns.

This table suggests the results of a linear regression with the structured variable being Nifty Infrastructure return and one unbiased variable, that is of the Nifty Financial Services sector.

C: this is the intercept or steady time period within the regression equation. The coefficient of -0.010784 approach that when the return of the Nifty Financial Services index is 0, the predicted value of the based variable Nifty Infrastructure Return is -0.010784. The Std. Error of 0.013737 suggests the precision of the estimate, and the t-statistic of -0.784978 shows that the coefficient isn't always statistically at 0.05 significance level, as the p-value (Prob.) is 0.4325.

Nifty Financial Services return: that is the impartial variable and has a coefficient of 0.740564. this means that a one-unit growth within the return of Nifty Financial Services sector leads to an expected growth of 0.740564 gadgets inside the dependent variable, conserving all other variables steady. The standard error of 0.007675 suggests the precision of the estimate, and the t-statistic of 96.49067 indicates that this coefficient is statistically strong, as the p-value (Prob.) is 0.

Overall, the regression model shows that there's relationship between the return of the Nifty Financial Services sector return and the Nifty Infrastructure sector return. The intercept isn't always statistically strong, indicating that once the return of the Nifty Financial Services return is 0.

2.10: Breusch-Godfrey Serial Correlation LM Test

Table 7: Results of Breusch-Godfrey Serial Correlation LM test

F-statistic	1.428406	Prob.F(1,4777)	0.2319
Obs*R-squared	1.428876	Prob.Chi-Square(1)	0.2319

Source: Author's Compilation

The above table shows the results of Breusch-Godfrey Serial Correlation LM test of Nifty Infrastructure sector returns and Nifty Financial Services sector returns

This table offers the outcomes of the Breusch-Godfrey Serial Correlation LM test, which is a test used to come across the presence of serial correlation inside the residuals of a regression model.

The table evaluations two check statistics: the F-statistic and the Obs*R-squared statistic. The F-statistic is 1.428406 and its associated possibility, Prob.F(1,4777), is 0.2319. This suggests that there is no sizeable serial correlation inside the residuals of the regression model, because the p-value is more than 0.05. In other phrases, we can't reject the null hypothesis that there's no serial correlation within the residuals.

The Obs*R-squared statistic is 1.428876, and its related probability, Prob. Chi-square(1), is likewise 0.2319. This statistic is used to test for higher-order serial correlation in the residuals. The p-value is more than the standard significance level of 0.05, indicating that we cannot reject the null hypothesis of serial correlation within the residuals.

General, those consequences recommend that there may be no proof of serial correlation within the residuals of the regression model. Consequently, the model is a good match for the facts, and the estimates of the regression coefficients are dependable.

2.11: Pairwise Granger Causality Tests:

Table 8: Results of Pairwise Granger Causality test

Null Hypothesis	Obs	F-Statistic	Prob.
Nifty Infrastructure Return does not Granger Cause Nifty	4779	3.02242	0.0488
Financial Services Return			
Nifty Financial Services Return does not Ganger Cause Nifty		13.5314	0.00001
Infrastructure Return			

Source: Author's Compilation

The above table shows the results of Pairwise Granger Causality test of Nifty Infrastructure sector returns and Nifty Financial Services sector returns

This table shows the results of Pairwise Granger causality assessments, that are used to check whether one variable Granger-causes another variable. Granger causality is a statistical idea that measures whether the past values of 1 variable can assist are expecting the final values of another variable, past what's explained with the aid of the beyond values of that variable.

The table shows the outcomes of two variables. The first take a look at is whether or not the Nifty Infrastructure sector return Granger-reasons the Nifty Financial Services sector return and it is null hypothesis.

Nifty Infrastructure return does not Granger causality the Nifty financial services return. The table shows an F-statistic of 3.02242 and a p-value of 0.0488, indicating that we are able to reject the null hypothesis at the 0.05. This indicates that there may be proof of Granger causality running from Nifty Infrastructure return and Nifty Financial Services return, which means that the beyond values of Nifty Infrastructure return can help are expecting the future values of Nifty Financial Services sector return what is defined by the past values of Nifty Financial Services sector return.

The second test is whether the Nifty Financial Services return Granger causality the Nifty Infrastructure return. The null hypothesis for this test is that the Nifty Financial Services return does not Granger causality the Nifty Infrastructure return. The table shows an F-statistic of 13.5314 and a p-value is 0.00001, indicating that we will reject the null hypothesis at 0.05. This suggests that there's evidence of Granger causality strolling from Nifty financial services return to Nifty Infrastructure return, meaning that the beyond values of Nifty

Financial Services return can help predict the final values of Nifty Infrastructure return beyond what is explained by means of the beyond values of Nifty Infrastructure return.

Standard, these outcomes suggest that there is a Granger-causality relationship among Nifty Infrastructure return and Nifty Financial Services return. this means that changes in Nifty Infrastructure return can help expect destiny adjustments in Nifty Financial Services return, and vice versa.

CHAPTER III: SUMMARY, FINDINGS AND SUGGESTIONS

3.1: Findings:

From the graphical analysis of trend on Nifty Financial Services sector return and Nifty Infrastructure sector return.

- The prices of both the sector were increasing from 2004 to 2005, After this period from 2005 to 2007 Nifty Infrastructure have spike over 6,000 and Nifty Financial Services sector was around 4,000.
- It can be seen that in 2008 both sectors have decreased to 2500, and from that onwards Nifty Financial Services sector bounce back and it was more than Nifty Infrastructure sector.
- From 2008 to 2020 Nifty Financial Services sector rise from 4,000 to 15,000 and Nifty Infrastructure sector was around 4,000.
- In 2020 market got crashed because of COVID-19 and the Nifty Financial Services sector crashed from 15,000 to 8,000 and Nifty Infrastructure sector crash from 3,800 to 2,500.
- The COVID-19 fall slowly recovered and the both sectors have shown higher returns than it was before the crash.
- Now currently on 31st March 2023 Nifty Financial Services sector is trading around 18,050 and Nifty Infrastructure sector is around 5,090.

From the Graphical analysis of Nifty Infrastructure sector return

- The return of Nifty Infrastructure sector return in 2004 to 2006, and in 2004 went to +10% to -15% and in 2006 was it was around +6% to -6.5%.
- > In 2007 ending quarter return was +8% to -12% and from 2008 to 2009 return was +18% to -14%.
- And from 2010 to2019 returns were around +7% to -6% and in 2020 it was -13% fall later recovery of +7%. And from 2020 to 2023 return was +4% to -6%.

From Graphical analysis of Nifty Financial Services sector

The return of Nifty Financial Services sector return in 2004 to 2008, and in 2004 return was around +12.5% to -12%, around 2006 it was +6% to -6.5%.

- In 2008 to 2009 return was +18% to -13%, and from 2010 to 2019 it was around +7% to -6%.
- In 2020 in COVID-19 fall return was -18% and post 2020 it was around +9% and from 2020 to 2023 return was around +7% to -6%.

From the Descriptive Statistics test:

- Mean for the Nifty Financial Services sector return is 0.060536 and for Nifty Infrastructure sector return is 0.034047.
- Median for the Nifty Financial Services sector return is 0.095474 and for Nifty Infrastructure sector return is 0.100894.
- Maximum for the Nifty Financial Services sector return is 1780685 and for Nifty Infrastructure sector return is 17.52382.
- Minimum for Nifty Financial Services sector return is -17.80685 and Nifty Infrastructure sector return is -15.02145.
- Standard Deviation for Nifty Financial Services sector return is 1.789054 and Nifty Infrastructure sector return is 1.62794 and lower is the better
- Skewness for Nifty Financial Services sector return is -0.313639 and Nifty Infrastructure sector is -0.406423 and both are negatively skewed.
- Kurtosis for Nifty Financial Services sector return is 11.93381 and Nifty Infrastructure sector return is 13.192, since it is above 3 it is called Leptokurtic.

From the Augmented Dickey-Fuller (Unit Root Test):

Since the p-value is less than 0.05 at 5% level of significant then there is no unit root test (ADF). Hence the data is stationary.

From the Correlation Test:

The Nifty Financial Services sector and Nifty Infrastructure sector are positively correlated. Since correlation value is 0.812931 the variables are positively correlated.

From the Regression:

- The variable C intercept coefficient is 0.030313 with t-Statistic of 2.210986 and p-value of 0.0271. This indicates that intercept is statistically significant.
- The variable Nifty Infrastructure return the coefficient is 0.88879 with very large t-Statistic and p-value of 0, its indicating this variable is highly statistically significant.

- The variable AR(1) the Coefficient is 0.673691 with t-Statistic value is 5.282643 and p-value is 0, this indicating it statistically significant.
- The variable AR(2) the coefficient is -0.084385 with t-statistic is -5.83496 and p-value is 0, indicating it is statistically significant.
- The variable MA(1) the coefficient is -0.625316 with t-Statistic is -4.89882 and p-value is 0, indicating it is statistically significant.

From Breush-Godfrey Correlation LM Test:

There is no significant correlation between the residuals of a version and the lagged values of the residuals failing to reject the null hypotheses. There

From the Granger Causality test:

- The Nifty Infrastructure sector return p-value is 0.0488 which is less than significance alpha value, therefore Nifty Infrastructure sector return doesn't cause Nifty Financial Services sector return.
- The Nifty Financial Services sector return p-value is 0.00001 which is less than significance alpha value, therefore Nifty Financial Services sector return doesn't cause Nifty Infrastructure sector return.

3.2: Conclusions

This study on Relationship Between Nifty Infrastructure and Nifty Financial Services Sector: Evidence from India. The purpose of the study is to examine the trends, impact, relationship and its causality effects of Nifty Infrastructure and Nifty Financial Services sector. To analysis the output line graph, descriptive statistics, augmented dickey-faller (unit root) test, correlation, regression, serial correlation lm test, pairwise ganger causality test were employed. The sample data used for analysis is around 20 years data sample. In Augmented dickey-fuller test both Nifty Financial Services Return and Nifty Infrastructure Return are stationary time series, meaning that they have a constant mean and variance over time and are suitable for the modelling, correlation analysis there is a strong positive correlation between Nifty Financial Services Return and Nifty Infrastructure Return, the regression model suggests that the Nifty Financial Services is dependent on its own past values, the past errors, and Nifty Infrastructure Return. Serial Correlation LM model can be used to make predictions about the values of Nifty Financial Services based on the values of the independent variables and these results suggest that there is no significant evidence of serial correlation in the residuals of the regression model. The regression model suggests that there is a strong positive relationship between the return of the Nifty Financial Services index and the Nifty Infrastructure Return, the intercept is not statistically significant.

3.3 Suggestions

This study focused on the relationship between Nifty Infrastructure and Nifty Financial Services return, the evidence was from Indian stock market. The selected pattern size may be multiplied in future studies as there's a strong want to conduct similar empirical investigations on large information. It would be clever to bear in mind different moderating variables to get complete understanding. Moreover, this study can be taken as reference to do further studies in this similar field like, impact of volatility, returns from the sectors and it can be extended to index wise study also, which will help the investors to gain an in-depth knowledge.

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