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Impact of Macroeconomics Factors on Stok Market Performance

"A Panel Data Analysis"

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Abstract

Using a panel data analysis approach, this research identifies the impact of GDP growth on stock prices across sector wise indices including BSE Sensex, Bankex, FMCG, Oil &Gas Healthcare and Information technology in India. This study explores the relationship between macroeconomics factors specifically GDP growth and Indian stock market. The analysis uses descriptive statistics and quantifies the relationship with ordinary least squares (OLS) regression.

The results show that higher stock returns are driven by larger GDP growth across all sectors. GDP growth in regression coefficients has a significant p-value of less than the 0.5. Then it shows that GDP growth has an important impact on the stock price, with different sensitivity among sectors.

The study highlights the significance of GDP growth as an important driver of market behaviour, providing useful insights for investors and policymakers. The paper ends with suggestions for future studies to investigate other macroeconomic elements including industry-specific analysis providing a certain level of comprehension of the economies and potentials in investment.

Introduction

Macroeconomic indicators and their impact on stock market have attracted great attention by the economists and financial analysts. Stock markets — the barometer for economic health, move along with indices and prices of stocks based on the changes in status of a nation's economy. GDP growth is one of the most significant macroeconomic indicators that directly affect the movement of stock market price as it indicates the entire economic activity and stability of a country (Mankiw, 2020).

The second study analyses the sensitivity of different sectors of Indian stock exchange sectoral indices (BSE Sensex, Bankex, FMCG, Oil & Gas, Healthcare and Information Technology) towards GDP growth. Heaps of past studies have said that a high correlation exists between GDP growth and stock returns, which denotes economic growth appears to build investor confidence and help boost evaluations in the marketplace (Fama, 1981; Levine & Zervos, 1998). Yet this impact is heterogeneous because of the industrial heterogeneity and the degree to macroeconomic conditions.

Objective

- To study the relationship of GDP growth and stock market indices in India
- Review this relationship across sectors.

This research aims to help fill this gap in the literature by analysing panel data analysis means, and giving a broader view of how GDP growth affects stock prices across different sectors. The results will help investors and policy-makers develop strategies to navigate economic ups & downs.

Literature Review

Many the various relationships between macro characteristics and stock market performance have been conducted, including GDP growth, inflation and interest rates, with some economists analysing their result. In order to contribute towards the modelling of interests about GDP growth and stock market indices, especially within the context of India, this section presents a review of literature in the area up-to-date till Oct 2023.

The Relationship Between Macroeconomic Factors and Stock Returns

For example, Fama (1981) argued that stock returns are predictable based on macroeconomic variables with stock prices encapsulating the market's expectations about future economic activity Because GDP growth, an indicator of economic output, tends to be positively correlated with the stock market—strong economic growth helps raise corporate earnings and boost investor confidence. Likewise, (Schwartz 2008) (Levin and Zervos 1998) also points to economic growth as a driver of the development of financial markets, asserting that a robust economy fosters stock market expansion.

However, research shows that the Indian stock market indices be it BSE Sensex or Nifty 50 have strong correlation with GDP growth. Sharma and Mahendru (2010) examined the connection between macroeconomic indicators and Indian stock market, highlighting GDP growth as a major determinant for both positive and significance in stock market. They said changes by sector occur because some industries have exposure to the economic ups and downs that others do not.

Sensitivity to Stock Market by Sectors

While the GDP growth is good for broad-based stock market but affects the sectors patchily. Sectors that are more sensitive to economic disparity tend to be macroeconomic stability and public demand dependent industries such as Information Technology and Financial services (Goyal & Arora, 2012). In contrast, Oil & Gas and FMCG are typically much less reactive as they tend to be more aligned with global commodity prices and consumer staples than short term economic moves.

The Methodological Takeaway from Such Studies

Panel data analysis has been widely used in the context of macroeconomic effects on stock market returns. Panel data with its cross-sectional and time series nature, is suitable to begin with panel data techniques (Baltagi, 2005).

Gaps in Existing Research

Although prior literature has provided great insights into what we might term the fundamental workings of stock markets (in their widest aggregates) in response to GDP growth, there are few systematic sector-wise analyses for India. Also, majority of the studies focus on only few macroeconomic variables where as inflation, exchange rate and interest rate also can study.

Methodology

It is a quantitative study of the effect of performance and construction and Indian stock market with respect to GDP growth. Through panel data analysis, it studies sector-wise indices to determine the differences in vulnerability to macroeconomic factors. The methodology includes data collection, statistical methods, and regression models.

Research Design:

An exploratory research design is used to relate GDP growth with sector-based stock market response. Abstract This study is designed in order to measure the effect of GDP growth on stock prices in different sectors by means of secondary data and various statistical techniques.

Data Collection:

The research uses secondary data from end reliable financial databases and government sources. Key variables include:

Variables	Source of Data
Macroeconomics (Independent Variable)	
GDP Growth Rate	IMF Survey Report
Stock Market (Dependent Variables)	
Sensex	www.bseindia.com
BSE Bankex	www.bseindia.com
BSE Oil & Gas	www.bseindia.com
BSE FMCG	www.bseindia.com
BSE Healthcare	www.bseindia.com
BSE Information Technology	www.bseindia.com

Analytical Tools

Statistical methods used are:

Descriptive Statistics: We calculate the mean, median, and standard deviation of both GDP growth as well as stock market indices to get an idea on their central tendencies as well as variability

Ordinary Least Squares (OLS) Regression: OLS regression was used to analyze the linear relationship of interest between GDP growth and stock market indices. It is also a great skill to determine whether GDP growth has a significant bearing on the stock price and how strong that relationship is.

Analysis

Effect of GDP growth on BSE Sensex

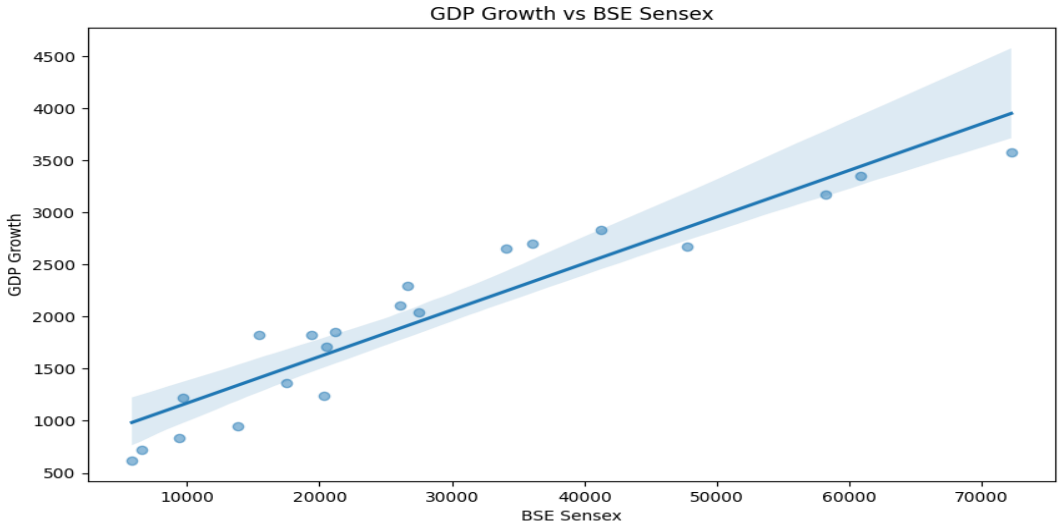
About The BSE Sensex: (Bombay Stock Exchange Sensitivity Index), is a benchmark index of the stock market that consists of 30 of the largest and most actively traded companies in India. It is considered a crucial barometer for market performance and economic developments in the country

Descriptive Statistics			
	Mean	Std. Deviation	N
BSE Sensex	28109.3081	18657.35690	21
GDP Growth	1979.1681	882.76930	21

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-11385.496	3447.879		-3.302	.004
	GDP Growth	19.955	1.597	.944	12.493	.000

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6206389198.283	1	6206389198.283	156.074	.000[b]
	Residual	755550133.489	19	39765796.499		
	Total	6961939331.772	20			

Model Summary							
					Change Statistics		
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1
1	.944[a]	.891	.886	6306.01273	.891	156.074	1



India's GDP growth has a positive and significant effect on the BSE Sensex [coefficient = 19.955, P-value <0.05] as per regression analysis. This means for every 1% rise in GDP growth, the Sensex is going to higher by 19.955 points which indicates that during periods of economic growth investor have a tendency to invest more and more on large-cap (blue-chip) companies. With a p-value equal to 0.000, it is establishing statistically significant correlation between GDP growth and Sensex as one of the parameters which clearly shows that how too closely both are working in case of shall I say performing with respect to each other.

Effect of GDP growth on BSE Bankex

BSE Bankex

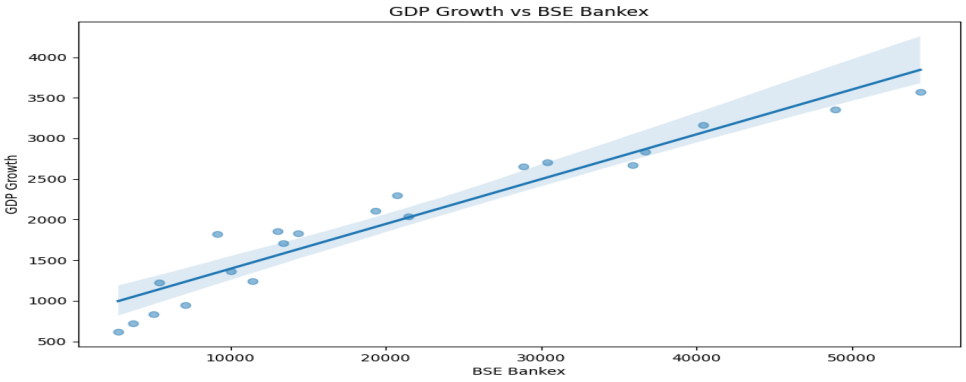
The BSE Bankex is an index for banking sector stocks signals the performance of this financially profitable industry. This is heavily dependent on GDP growth, suggesting the sector's reliance on economic growth to deliver profits.

Descriptive Statistics			
	Mean	Std. Deviation	N
BSE Bankex	20594.9471	15367.76961	21
GDP Growth	1979.1681	882.76930	21

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-12509.000	2390.012		-5.234	.000
	GDP Growth	16.726	1.107	.961	15.106	.000
a. Dependent Variable: BSE Bankex						

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4360322630.421	1	4360322630.421	228.198	.000[b]
	Residual	363044227.154	19	19107590.903		
	Total	4723366857.575	20			

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.961[a]	.923	.919	4371.22304	.923	228.198	1	19	.000
a. Predictors: (Constant), GDP Growth									



For BSE Bankex, the regression analysis reveals a positive relationship with GDP growth at 16.726. It illustrates that, for each 1% improvement in GDP growth an additional increase of 16.726 points in the Bankex index is observed, suggesting the heavy reliance of the banking sector on economic activity and its crucial role as a driver of financing growth. With a p-value of 0.000, this relationship confirms that GDP growth is an important driver for the financial sector and also proves that our model is statistically significant as well.

Effect of GDP growth on BSE Oil and Gas

BSE Oil & Gas

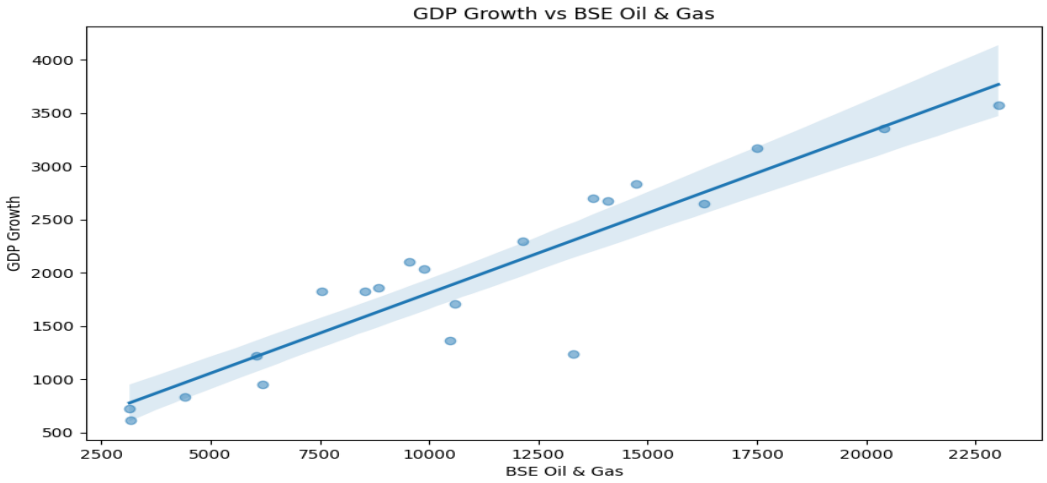
Companies engaged in the production and dissemination of energy compose the Oil & Gas index on BSE. It has low GDP sensitive as it is often more influenced by global commodity prices than GDP growth.

Descriptive Statistics			
	Mean	Std. Deviation	N
BSE Oil & Gas	11124.4100	5392.77653	21
GDP Growth	1979.1681	882.76930	21

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	9.439	1190.525		.008	.994
	GDP Growth	5.616	.552	.919	10.182	.000

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	491559124.667	1	491559124.667	103.680	.000[b]
	Residual	90081649.829	19	4741139.465		
	Total	581640774.495	20			

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.919[a]	.845	.837	2177.41578	.845	103.680	1	19	.000



In the case of BSE Oil & Gas index, regression analysis shows the positive relationship with GDP growth having a coefficient of 5.616 For example, it indicates that a 1% boost in GDP growth raises the index by 5.616 points. Even though the relationship is statistically significant (p-value = 0.000), the effect coefficient is quite small which indicates that this sector has very low sensitivity to GDP growth as this sector highly depends on global commodity price and regulatory factors.

Effect of GDP growth on BSE Healthcare

BSE Healthcare

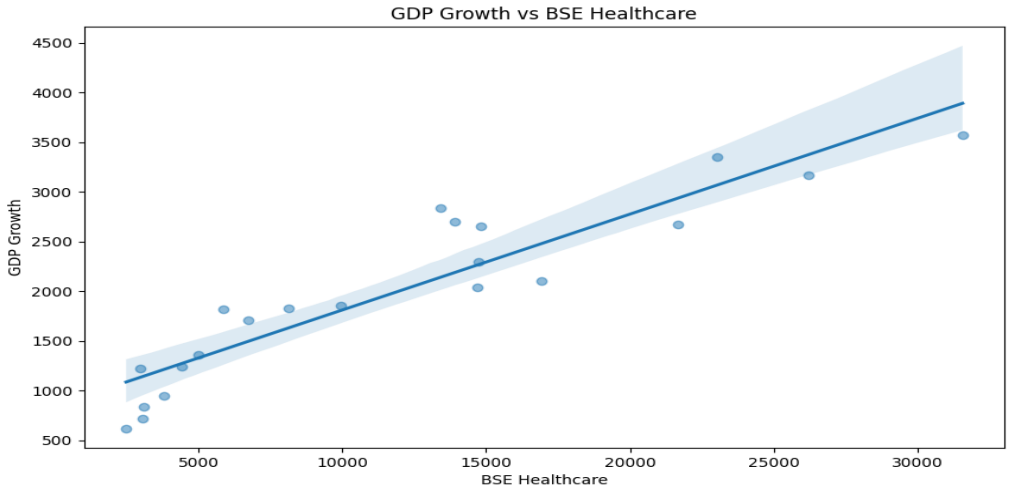
BSE healthcare index tracks pharma and health care companies. This low sensitivity to GDP growth rates is a characteristic of defensive stocks, which benefit from stable demand regardless of the economic cycle.

Descriptive Statistics			
	Mean	Std. Deviation	N
BSE Healthcare	11738.7367	8482.90529	21
GDP Growth	1979.1681	882.76930	21

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-5886.147	1788.119		-3.292	.004
	GDP Growth	8.905	.828	.927	10.750	.000

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1235980403.776	1	1235980403.776	115.562	.000[b]
	Residual	203213240.348	19	10695433.703		
	Total	1439193644.124	20			

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.927[a]	.859	.851	3270.38739	.859	115.562	1	19	.000



As per the same analysis for BSE Healthcare index, it has a positive and significant relation with GDP growth (Coefficient = 8.905) This means, a 1% increase in GDP growth will raise the index by 8.905 points. The defensive characteristic of the sector is reflected in its moderate sensitivity as demand for healthcare does not significantly decline, even in recessionary periods. The p-value of 0.000 indicates that this relationship is solid (as opposed to some due to random fluctuations in subgroups).

Effect of GDP growth on BSE Information Technology

BSE Information Technology

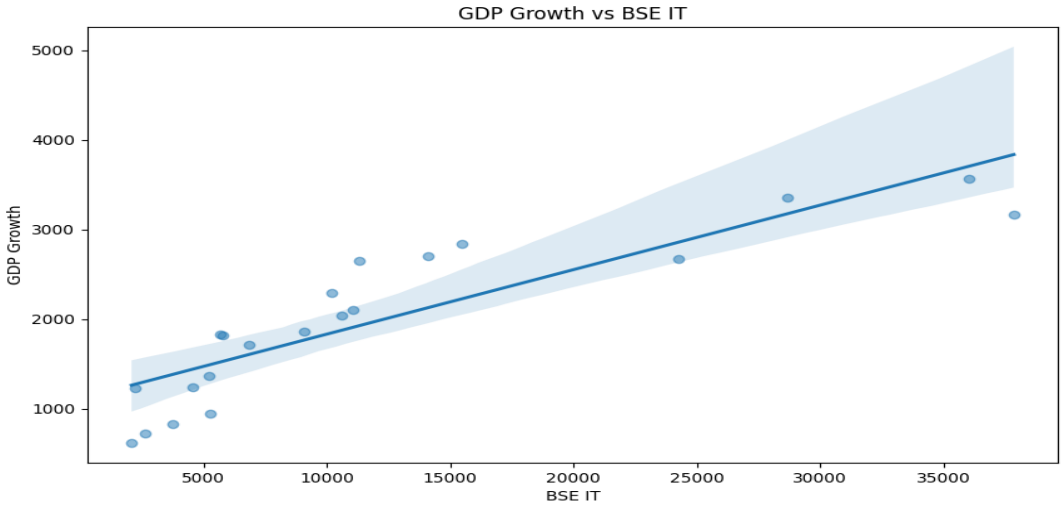
The BSE IT index stands for top tech companies, an import market sector for the Indian economy. Because demand for tech services tends to spike in growing economies, the stock has a lot of leverage to GDP growth.

Descriptive Statistics			
	Mean	Std. Deviation	N
BSE IT	12020.8100	10741.27689	21
GDP Growth	1979.1681	882.76930	21

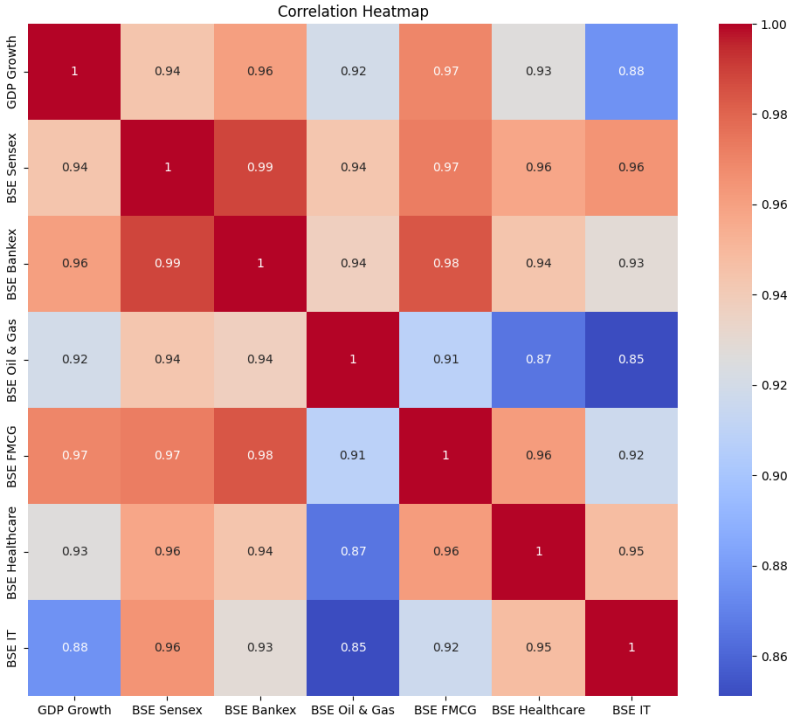
Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-9069.386	2908.687		-3.118	.006
	GDP Growth	10.656	1.348	.876	7.908	.000

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1769784220.666	1	1769784220.666	62.535	.000[b]
	Residual	537716362.809	19	28300861.200		
	Total	2307500583.475	20			

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.876[a]	.767	.755	5319.85537	.767	62.535	1	19	.000



In the above regression analysis for BSE IT index, the significant positive relationship of 10.656 is found implying that as GDP grow it pushes up the BSE IT index positively. This indicates that a 1% improvement in GDP growth results in a corresponding increase of 10.656 points on the IT index, demonstrating the sector's heavy reliance on domestic economic growth and global demand for technology services. With a p-value of 0.000, we confirm the statistical significance and highlight IT sector as significant contributor to economic growth.



Discussion

The analysis results illustrate that there is an ever-present positive correlation between sectoral indices behaviour in the Indian stock market and GDP growth. In this section, sectoral differences and the relevance of these results for investors and policymakers are discussed.

Overall Impact of GDP Growth

The results enable us to confidently conclude that GDP growth is the most important stock market driver, and all analyzed indices are statistically significant with a positive coefficient. This means that the expansion of the economy tends to directly lift market valuations through higher corporate earnings and gain in investor confidence. This kind of relationship is in line with previous literature that highlights GDP growth as an important factor for the development of financial markets (Fama, 1981; Levine & Zervos, 1998).

Sectoral Variations

So, although all sectors have a positive relation with GDP growth, sensitivity differ from mild to highly sensitive:

Highly Sensitive Sectors: BSE Sensex, Bankex, IT. These sectors tend to be more cyclical, performing well in economic expansions due to higher levels of business activity, consumer spending, and technology spending.

Moderately Sensitive Sectors: Healthcare and FMCG are moderately sensitive due to their defensive nature. These are the industries that have a steady demand, regardless of how good or bad the economy is doing which in itself makes it relatively stable.

Very Low GDP Growth Sensitivity Sectors: The Oil & Gas sector shows the lowest sensitivity to GDP growth due mainly either because sector performance tends to be driven by global oil prices and geopolitical factors more than domestic economic conditions.

Practical Implications

The implications of the findings are noteworthy for investors and policymakers alike:

For Investors: Sectoral sensitivity to GDP can help with portfolio diversification Cyclicals such as IT and banking are good growth-oriented sectors during the expansion phase of an economy while defensive sectors like healthcare and FMCG should succeed in case of contraction.

For Policymakers: GDP drives stock market returns the results confirm the need for creating growth through policy. Policymakers could also implement sectoral policies to reduce vulnerabilities and improve resilience to macroeconomic developments.

Limitations and Future Research

While this evidence finds a very robust connection between the performance of GDP growth and sectoral stock returns, it is limited to one macroeconomic factor only. The scope can be broadened in future studies to include other variables like inflation, interest rates and foreign exchange. Moreover, investigating the impact of GDP growth in different EMs can offer a comparative perspective and a deeper insight into international market behaviour.

Conclusion

GDP growth creates a substantial difference on Indian stock performance and the sensitivity across different sectors has been adequately shown in this study. BSE Sensex, Bankex, IT sectors are more of clater-the expectation from them is very high; FMCG and healthcare are stable but Oil & Gas is probably the least responsive to economic growth. The results highlight the relevance of GDP growth as a performance enhancement factor, providing investors and policy-makers with rich actionable information. Future studies can investigate more macroeconomic variables for better insights the impact of these economic factors simultaneously across the different economies on stock market fluctuations.

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