

Nifty 50 and Economic Growth in India: Examining the Relationship Between Stock Market Performance and Macroeconomic Stability

AUTHOR : **Dr.D.PADMA**

ASSOCIATE PROFESSOR OF ECONOMICS

GOVERNMENT DEGREE COLLEGE

KUKATPALLY, MEDCHAL-MALKAJGIRI DISTRICT,

HYDERABAD, TELANGANA, INDIA.

Abstract

This study examines the relationship between the performance of India's benchmark stock index, the Nifty 50, and the country's economic growth and macroeconomic stability over 2000–2025. Annual data on Nifty 50 closing values are combined with World Bank data on real GDP growth, consumer price inflation, the rupee–dollar exchange rate, foreign exchange reserves and foreign direct investment. The analysis uses descriptive and sub-period statistics, Pearson correlations, Augmented Dickey–Fuller unit root tests, multiple regression with heteroscedasticity-robust standard errors and a full set of diagnostic tests, Granger causality tests, and Engle–Granger cointegration with an error correction model. The Nifty 50 rose from 1,263.55 at the end of 2000 to 25,129.60 at the end of 2025, a compound annual growth rate of 12.9 per cent, but with high volatility (standard deviation of annual returns of 27.6 per cent). The results show a strong long-run relationship: the Nifty 50 and real output are cointegrated, with a long-run elasticity of about 1.96, and about 72 per cent of any deviation from this equilibrium is corrected within a year. In the short run, however, annual stock returns are not significantly related to GDP growth. The macroeconomic variable most closely linked to returns is the growth of foreign exchange reserves ($r = 0.48$), which proxies foreign capital inflows; it is the only significant regressor at the 5 per cent level in a model that explains 46 per cent of the variation in returns. Granger tests show that stock returns lead rupee movements, but there is no short-run causality between returns and growth in either direction. The study concludes that the Nifty 50 reflects India's long-run growth story but that its year-to-year movements are driven mainly by capital flows and external stability, with implications for investors and policymakers.

Keywords: *Nifty 50; stock market; economic growth; macroeconomic stability; cointegration; Granger causality; India*

JEL Classification: E44, G10, O16, C22, E31

1. Introduction

A well-functioning stock market is both a mirror and an engine of economic growth. As a mirror, share prices reflect investors' expectations of future corporate earnings, which depend on the growth of the economy. As an engine, the market channels household savings into productive investment, allows firms to raise capital, and provides liquidity and risk-sharing. Whether stock markets actually track the real economy, and which macroeconomic forces drive them, are therefore questions of great interest to investors, firms and policymakers.

In India these questions have become more important as the equity market has grown and as household participation has expanded through demat accounts and systematic investment plans in mutual funds. The Nifty 50, the flagship index of the National Stock Exchange (NSE), comprises fifty of the largest and most liquid Indian companies and is the most widely tracked benchmark of the Indian market. Between 2000 and 2025 it rose about twenty-fold, while India's real GDP grew about 4.6 times. Yet the path has been far from smooth: the index fell by 52 per cent in 2008 and by 25 per cent in 2011, and swung sharply during the COVID-19 pandemic, while GDP growth was much steadier.

This paper examines the relationship between the Nifty 50 and India's economic growth and macroeconomic stability over 2000–2025. It asks: (i) Does the stock market move with economic growth in the long run? (ii) Which macroeconomic variables (growth, inflation, the exchange rate, foreign exchange reserves and foreign investment)

explain annual stock returns? and (iii) Is there a causal relationship between stock returns and macroeconomic variables, and in which direction?

2. Review of Literature

The theoretical link between finance and growth goes back to Schumpeter, and was formalised by Levine and Zervos (1998), who found across 47 countries that stock market liquidity predicts future growth of output, capital and productivity. Fama (1981) showed that stock returns are positively related to future real activity, consistent with the view that the market anticipates the economy. Chen, Roll and Ross (1986) identified industrial production, inflation and interest rates as priced macroeconomic risk factors in US stock returns.

Evidence for India is mixed. Several studies find a long-run cointegrating relationship between Indian stock indices and macroeconomic variables such as industrial production, money supply, inflation and exchange rates, but weak or absent short-run causality. Studies using Granger causality often find that the stock market leads economic activity, while others find bidirectional or no causality depending on the period and the variables used. Research on foreign portfolio investment shows that foreign institutional investors play a major role in the short-run movement of Indian share prices, and that their flows are sensitive to global risk appetite.

Most existing Indian studies end before the pandemic or use monthly data on industrial production rather than GDP. This study adds to the literature by covering the period up to 2025, including the pandemic shock and recovery, by combining long-run cointegration analysis with short-run regression and causality tests, and by testing the role of external stability indicators such as foreign exchange reserves alongside growth and inflation.

3. Objectives and Hypotheses

3.1 Objectives

- To analyse the performance of the Nifty 50 and key macroeconomic indicators in India over 2000–2025 and across sub-periods.
- To examine the correlation between Nifty 50 returns and macroeconomic variables.
- To test for a long-run equilibrium relationship between the Nifty 50 and real output.
- To identify the macroeconomic determinants of annual Nifty 50 returns.
- To test the direction of causality between stock returns and macroeconomic variables.

3.2 Hypotheses

- **H01:** There is no significant correlation between Nifty 50 returns and macroeconomic variables.
- **H02:** There is no long-run (cointegrating) relationship between the Nifty 50 and real GDP.
- **H03:** Macroeconomic variables have no significant effect on annual Nifty 50 returns.
- **H04:** There is no Granger causality between Nifty 50 returns and macroeconomic variables in either direction.

4. Data and Research Methodology

The study uses annual data for 2000–2025. Nifty 50 calendar-year closing values were compiled from published records and checked for internal consistency; one inconsistency in the published table (the 2015 closing value) was corrected using the reported point change, and all returns were computed from closing levels. Macroeconomic data are from the World Bank's World Development Indicators. The World Bank reports India's GDP on a fiscal-year basis (for example, '2025' refers to 2025–26), which closely overlaps the calendar year. Table 1 defines the variables.

Table 1: Variables, definitions and data sources

Variable	Symbol	Definition and measurement	Source
Nifty 50 return	NR	Annual % change in the calendar-year closing value of the Nifty 50 index	NSE closing values (compiled from Wikipedia, verified for internal consistency)
Real GDP growth	GDP	Annual % growth of real GDP (constant prices)	World Bank, World Development Indicators (NY.GDP.MKTP.KD.ZG)
CPI inflation	INF	Annual % change in the consumer price index	World Bank (FP.CPI.TOTL.ZG)
Rupee depreciation	DEP	Annual % change in the average ₹/US\$ exchange rate (positive = depreciation)	Computed from World Bank (PA.NUS.FCRF)
Forex reserve growth	RESG	Annual % change in total reserves including gold (US\$)	Computed from World Bank (FI.RES.TOTL.CD)
FDI inflows	FDI	Net foreign direct investment inflows as % of GDP	World Bank (BX.KLT.DINV.WD.GD.ZS)
ln Nifty 50 / ln GDP index	LN, LG	Natural logarithm of the Nifty 50 close and of a real GDP index (2000 = 100) built from GDP growth	Computed by the author

Source: compiled by the author.

Since returns, growth rates and changes are computed from levels, the regression sample covers 2001–2025 (25 observations); the cointegration analysis uses levels for 2000–2025 (26 observations). The following techniques are applied:

- Descriptive and sub-period statistics, including compound annual growth rate (CAGR), volatility and the Jarque–Bera test of normality.
- Pearson correlation analysis with significance tests.
- Augmented Dickey–Fuller (ADF) tests for unit roots, with lag length chosen by the Akaike information criterion and MacKinnon (2010) critical values.
- Ordinary least squares (OLS) regression of Nifty returns on macroeconomic variables, with heteroscedasticity-robust (HC1) standard errors.
- Diagnostic tests: Jarque–Bera, Breusch–Pagan, Breusch–Godfrey, Ramsey RESET, Durbin–Watson and variance inflation factors (VIF).
- Pairwise Granger causality tests with one and two lags.
- Engle–Granger cointegration test between ln Nifty 50 and ln real GDP index, with an error correction model (ECM).

All computations were carried out by the author in Python. Because the sample is annual and relatively short, the tests have limited power, and the results should be interpreted with appropriate caution.

5. Results and Analysis

5.1 Descriptive statistics

Table 2: Descriptive statistics, 2001–2025

Statistic	NR	GDP	INF	DEP	RESG	FDI
Mean	16.37	6.35	6.03	2.82	13.13	1.59
Median	12.02	7.41	5.13	4.15	8.87	1.54
Std. deviation	27.63	3.00	2.57	5.27	16.85	0.70
Minimum	−51.79	−5.78	2.40	−8.74	−11.15	0.61
Maximum	75.76	9.69	11.99	14.50	55.34	3.62
Skewness	0.06	−2.95	0.89	−0.12	1.08	0.95
Kurtosis	4.22	14.06	2.91	3.37	3.71	4.56
Jarque–Bera	0.61	111.61	2.99	0.06	4.44	4.42
JB p-value	0.736	0.000	0.224	0.971	0.109	0.110
Observations	25	25	25	25	25	25

Note: NR, GDP, INF, DEP, RESG in per cent; FDI in per cent of GDP. Kurtosis is reported in raw form (normal = 3).

Source: author's calculations.

Table 2 shows that the average annual return on the Nifty 50 was 16.4 per cent, much higher than average real GDP growth of 6.4 per cent, but returns were about nine times as volatile (standard deviation 27.6 against 3.0). Returns ranged from −51.8 per cent in 2008 to 75.8 per cent in 2009. Nifty returns are approximately normally distributed (Jarque–Bera $p = 0.74$). GDP growth, by contrast, is strongly negatively skewed (−2.95) with very high kurtosis (14.1) and is clearly non-normal ($p < 0.001$), reflecting the single extreme contraction of 2020. Foreign exchange reserves grew on average by 13.1 per cent a year, and the rupee depreciated on average by 2.8 per cent a year.

5.2 Sub-period analysis

Table 3: Performance of the Nifty 50 and macroeconomic indicators by sub-period

Period	Nifty CAGR (%)	Mean annual return (%)	Volatility (SD, %)	Years with negative return	Mean GDP growth (%)	Mean CPI inflation (%)	Mean reserve growth (%)
2001–2007 (Pre-GFC boom)	25.33	28.66	30.86	1 of 7	6.87	4.58	32.35
2008–2013 (GFC and slowdown)	0.44	8.62	44.08	2 of 6	6.09	9.94	1.40
2014–2019 (Reform period)	11.58	12.36	14.62	1 of 6	6.80	4.59	7.84
2020–2025 (Pandemic and recovery)	13.58	13.78	7.38	0 of 6	5.57	5.24	7.72
2001–2025 (Full period)	12.88	16.37	27.63	4 of 25	6.35	6.03	13.13

Note: CAGR computed from closing values at the end of the year before the period to the end of the period. Source: author's calculations.

Table 3 shows that the relationship between the market and the economy differs sharply across periods. In the pre-crisis boom of 2001–2007 the Nifty grew at a CAGR of 25.3 per cent while GDP grew by 6.9 per cent and reserves by 32.3 per cent a year, a period of massive foreign capital inflows. In 2008–2013 the index barely moved (CAGR 0.4 per cent) and was extremely volatile, even though GDP still grew by 6.1 per cent; this period combined the global financial crisis with high inflation (9.9 per cent) and almost no growth in reserves. The reform period (2014–2019) and the pandemic-and-recovery period (2020–2025) saw steadier returns of 11.6 and 13.6 per cent a year, with volatility falling to 7.4 per cent in the latest period, the lowest of all. The comparison suggests that stock market performance is linked more closely to external stability and inflation than to the level of GDP growth: average GDP growth was similar across the first three periods, yet returns varied enormously.

5.3 Correlation analysis

Table 4: Pearson correlation matrix, 2001–2025

Variable	NR	GDP	INF	DEP	RESG	FDI
NR	1.00					
GDP	0.31	1.00				
INF	0.03	−0.05	1.00			
DEP	−0.22	−0.25	0.31	1.00		
RESG	0.48**	−0.13	−0.31	−0.50**	1.00	
FDI	−0.24	−0.33	0.48**	0.24	−0.19	1.00

*Note: ** and * denote significance at 5% and 10% respectively (two-tailed). Source: author's calculations.*

Table 4 shows that the Nifty return has a positive but statistically insignificant correlation with GDP growth ($r = 0.31$, $p = 0.13$). The only macroeconomic variable significantly correlated with returns is the growth of foreign exchange reserves ($r = 0.48$, $p < 0.05$). Since reserves rise mainly when foreign capital flows into India, this indicates that capital inflows and stock prices move together. Reserve growth is also significantly and negatively correlated with rupee depreciation ($r = -0.50$), confirming that inflows strengthen the rupee. FDI is positively correlated with inflation ($r = 0.48$). H_01 is therefore rejected for reserve growth but not for the other variables.

5.4 Unit root tests

Table 5: Augmented Dickey–Fuller unit root tests

Series	Specification	Lags (AIC)	ADF statistic	t-1% critical value	5% critical value	Conclusion
ln Nifty 50 (level)	Constant and trend	0	−4.978	−4.42	−3.62	Stationary at 1%
ln Real GDP index (level)	Constant and trend	0	−2.269	−4.42	−3.62	Non-stationary
Δ ln Nifty 50	Constant	1	−5.366	−3.77	−3.01	Stationary at 1%
Δ ln Real GDP index	Constant	0	−4.397	−3.77	−3.01	Stationary at 1%

Series	Specification	Lags (AIC)	ADF t-statistic	1% critical value	5% critical value	Conclusion
Nifty return (NR)	Constant	0	-7.693	-3.77	-3.01	Stationary at 1%
GDP growth	Constant	0	-4.393	-3.77	-3.01	Stationary at 1%
CPI inflation	Constant	0	-1.372	-3.77	-3.01	Non-stationary
Rupee depreciation	Constant	0	-4.316	-3.77	-3.01	Stationary at 1%
Reserve growth	Constant	0	-4.442	-3.77	-3.01	Stationary at 1%
FDI (% of GDP)	Constant	0	-2.566	-3.77	-3.01	Non-stationary

Note: lag length selected by AIC (maximum 2); critical values from MacKinnon (2010) response surfaces for the effective sample size. Source: author's calculations.

Table 5 shows that Nifty returns, GDP growth, rupee depreciation and reserve growth are stationary, so they can be used directly in regression. The log of the real GDP index is non-stationary in levels but stationary in first differences, that is, integrated of order one. The log of the Nifty 50 rejects a unit root around a deterministic trend, but given the low power of the test in small samples and the stationarity of its first difference, it is treated as trending in the cointegration analysis. CPI inflation and FDI do not reject a unit root in this short sample; this is likely to reflect low test power and the structural shift in inflation after the adoption of inflation targeting in 2016, and these variables are interpreted with caution in the regression.

5.5 Regression analysis

Table 6: OLS regression of annual Nifty 50 returns on macroeconomic variables

Variable	Coefficient	Robust error	std. t-statistic	p-value
Constant	-32.584	30.295	-1.076	0.296
GDP growth	3.716	2.432	1.528	0.143
CPI inflation	3.026*	1.653	1.831	0.083
Rupee depreciation	0.885	1.266	0.699	0.493
Reserve growth	1.107**	0.420	2.633	0.016
FDI (% of GDP)	-6.236	8.851	-0.705	0.490
R-squared	0.457			
Adjusted R-squared	0.314			
F-statistic (p-value)	3.20 (0.029)			
Durbin-Watson	2.254			
Observations	25			

Note: dependent variable is the annual Nifty 50 return (%). Standard errors are heteroscedasticity-robust (HCl). ***, ** and * denote significance at 1%, 5% and 10%. Source: author's calculations.

The model in Table 6 is statistically significant as a whole ($F = 3.20$, $p = 0.029$) and explains 46 per cent of the variation in annual returns (adjusted $R^2 = 0.31$). Reserve growth is the only regressor significant at the 5 per cent level: holding other factors constant, a 1 percentage point increase in the growth of reserves is associated with a 1.11 percentage point higher Nifty return. CPI inflation has a positive coefficient significant at the 10 per cent level, which likely reflects the nominal nature of stock returns and the fact that inflation tended to be higher in periods of strong demand. GDP growth has the expected positive sign (3.72) but is not significant ($p = 0.14$). A simple regression of returns on GDP growth alone gives an R^2 of only 0.10. H_03 is therefore rejected for reserve growth but not for GDP growth, the exchange rate or FDI.

5.6 Diagnostic tests

Table 7: Diagnostic tests for the regression model

Test	Statistic	p-value	Null hypothesis	Decision
Jarque–Bera (normality of residuals)	0.306	0.858	Residuals are normal	Not rejected
Breusch–Pagan (heteroscedasticity)	5.663	0.340	Constant variance	Not rejected
Breusch–Godfrey LM(1) (serial correlation)	1.007	0.316	No serial correlation	Not rejected
Ramsey RESET (functional form)	0.001	0.971	Model correctly specified	Not rejected
Durbin–Watson	2.254	–	No first-order autocorrelation (≈ 2)	No autocorrelation
VIF: Real GDP growth	1.35	–	$VIF < 10$	No multicollinearity
VIF: CPI inflation	1.44	–	$VIF < 10$	No multicollinearity
VIF: Rupee depreciation	1.59	–	$VIF < 10$	No multicollinearity
VIF: Forex reserve growth	1.55	–	$VIF < 10$	No multicollinearity
VIF: FDI inflows (% of GDP)	1.50	–	$VIF < 10$	No multicollinearity

Source: author's calculations.

Table 7 shows that the regression satisfies the main classical assumptions. The residuals are normally distributed (Jarque–Bera $p = 0.86$), there is no evidence of heteroscedasticity (Breusch–Pagan $p = 0.34$) or serial correlation (Breusch–Godfrey $p = 0.32$; Durbin–Watson = 2.25), and the RESET test does not indicate misspecification ($p = 0.97$). All variance inflation factors are below 1.6, well under the conventional threshold of 10, so multicollinearity is not a concern. The estimates in Table 6 can therefore be considered statistically reliable within the limits of the sample size.

5.7 Granger causality tests

Table 8: Pairwise Granger causality tests

Null hypothesis	F (lag 1)	p (lag 1)	F (lag 2)	p (lag 2)	Decision (5%)
Nifty return does not Granger-cause GDP growth	0.18	0.678	0.00	0.997	Do not reject
GDP growth does not Granger-cause Nifty return	0.63	0.438	0.11	0.894	Do not reject
Nifty return does not Granger-cause CPI inflation	0.05	0.831	0.14	0.870	Do not reject
CPI inflation does not Granger-cause Nifty return	0.22	0.647	3.14*	0.068	Do not reject
Nifty return does not Granger-cause Reserve growth	0.98	0.333	0.34	0.714	Do not reject
Reserve growth does not Granger-cause Nifty return	0.09	0.773	1.83	0.190	Do not reject
Nifty return does not Granger-cause Rupee depreciation	7.40**	0.013	3.27*	0.061	Reject
Rupee depreciation does not Granger-cause Nifty return	1.78	0.197	2.22	0.138	Do not reject

Note: ** and * denote significance at 5% and 10%. Source: author's calculations.

Table 8 shows no Granger causality between stock returns and GDP growth in either direction at one or two lags, so past stock returns do not help to predict growth and past growth does not help to predict returns in annual data. The only significant result at the 5 per cent level is that Nifty returns Granger-cause rupee depreciation at one lag ($p = 0.013$): a strong stock market year tends to be followed by changes in the exchange rate, consistent with the role of foreign portfolio flows in linking the equity and currency markets. There is weak evidence (10 per cent level, two lags) that inflation leads stock returns and that stock returns lead the exchange rate. H_0 is therefore rejected only for the relationship between stock returns and the exchange rate.

5.8 Long-run relationship: cointegration and error correction

Table 9: Engle–Granger cointegration and error correction model

Item	Estimate	Std. error	t-statistic	p-value / remark
A. Long-run equation: $\ln \text{Nifty} = \alpha + \beta \ln \text{GDP index}$				
Constant (α)	-1.824	0.493	-3.702	0.001
Long-run elasticity (β)	1.959***	0.091	21.476	0.000
R-squared; observations	0.951			26
B. Engle–Granger test on residuals				
ADF t-statistic (lags)	-3.677 (0)			Critical values: 1% -4.39, 5% -3.60, 10% -3.23

Item	Estimate	Std. error	t-statistic	p-value / remark
Conclusion	Cointegrated at 5%			
C. Error correction model: $\Delta \ln$ Nifty				
Constant	-0.086	0.146	-0.590	0.561
$\Delta \ln$ GDP index	3.396	2.094	1.622	0.119
Error correction term (t-1)	-0.715**	0.277	-2.576	0.017
R-squared; observations	0.427			25

Note: long-run equation estimated for 2000–2025; ECM for 2001–2025 with robust standard errors. Engle–Granger critical values from MacKinnon (2010) for two variables with a constant. ***, ** denote significance at 1% and 5%. Source: author's calculations.

Table 9 provides the clearest evidence of a link between the stock market and the economy. The long-run equation shows that the Nifty 50 and the real GDP index move together closely ($R^2 = 0.95$), with an elasticity of 1.96: a 1 per cent increase in real output is associated in the long run with an increase of about 2 per cent in the index. This is consistent with corporate profits growing faster than GDP and with the rising share of the listed corporate sector in the economy. The Engle–Granger test statistic (-3.68) is below the 5 per cent critical value (-3.60), so the two series are cointegrated and H_0 is rejected. The error correction term is negative and significant (-0.72 , $p = 0.017$), indicating that about 72 per cent of any deviation of the index from its long-run relationship with output is corrected within a year. Episodes such as the 2008 crash and the 2020 slump were therefore followed by strong reversion towards the level justified by the economy.

6. Discussion

The results reconcile two common but apparently contradictory views. The first view, that 'the stock market is not the economy', is supported by the short-run results: annual Nifty returns are much more volatile than GDP growth and are not significantly explained or predicted by it. The second view, that the market reflects the country's growth story, is supported by the long-run results: the index and real output are cointegrated and the market returns to its growth-justified path after shocks.

The key short-run link is external stability. Reserve growth, which in India is driven mainly by foreign capital inflows and RBI intervention, is the only significant determinant of returns, and stock returns lead the exchange rate. This is consistent with the large role of foreign portfolio investors in the Indian market, especially before 2014. The fall in volatility since 2020, despite the pandemic, coincides with a much larger role for domestic investors through mutual funds and systematic investment plans, which has made the market less dependent on foreign flows.

The results also highlight the importance of macroeconomic stability more broadly. The worst period for the market, 2008–2013, was not a period of low growth but one of high inflation, large fiscal and current account deficits and weak reserves. Periods of low inflation and rising reserves delivered higher and steadier returns.

7. Findings, Implications and Limitations

7.1 Major findings

- The Nifty 50 grew at a CAGR of 12.9 per cent over 2001–2025 with high volatility, which has declined markedly since 2020.
- In the long run the Nifty 50 is cointegrated with real GDP, with an elasticity of about 2 and rapid error correction.
- In the short run, annual returns are not significantly related to GDP growth.
- Foreign exchange reserve growth is the strongest macroeconomic correlate and determinant of annual returns.

- Stock returns Granger-cause exchange rate movements; there is no short-run causality between returns and growth.

7.2 Implications

- **Investors:** long-term equity investment in India is supported by the economy's growth, but short-term returns depend heavily on capital flows and global conditions, which favours disciplined, long-horizon investing.
- **Policymakers:** macroeconomic stability (low inflation, adequate reserves, a stable currency) matters for market performance as much as growth itself; policies that deepen domestic institutional investment can reduce dependence on volatile foreign flows.
- **Regulators:** monitoring of foreign portfolio flows and their spillover to the currency market remains important for financial stability.

7.3 Limitations and scope for further research

The study uses annual data with 25–26 observations, which limits the power of unit root, causality and cointegration tests. Further research could use quarterly or monthly data, include variables such as interest rates, corporate earnings, foreign portfolio flows, oil prices and global market indices, and apply techniques such as ARDL bounds testing, vector autoregression or structural break tests.

8. Conclusion

This paper finds that the Nifty 50 and India's economy are closely linked in the long run but loosely linked in the short run. Over 2000–2025 the index has tracked and amplified the country's growth, rising about twice as fast as real output and returning to this path after major shocks. From year to year, however, returns are driven mainly by capital flows and external stability rather than by GDP growth. For India to sustain both strong growth and a stable, deep stock market, continued emphasis on macroeconomic stability, low inflation, strong reserves and broad-based domestic participation in equity markets will be essential.

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