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THE NEXUS BETWEEN FINANCIAL MARKET DEVELOPMENT AND ECONOMIC GROWTH

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Abstract

Financial market development is widely seen as a key driver of economic performance because it improves capital allocation, mobilises savings, and raises investment efficiency. This study examines both long-run and short-run links between financial market development and economic growth in India using 22 years of annual time-series data. Net National Income (NNI) serves as the measure of economic growth, while financial market development is proxied by Mutual Fund Assets under Management (MFAUM), Life Insurance Corporation (LIC) investments, total capital mobilisation, gross capital formation, the call/notice money rate, consumer price inflation, and the trade balance. In this article the researcher assess the stationarity of the series with the Augmented Dickey–Fuller (ADF) test. Finding a mix of I(0) and I(1) variables and no I(2) series, we employ the Autoregressive Distributed Lag (ARDL) bounds testing framework to estimate the long-run equilibrium relationship and short-run dynamics. Results indicate a significant cointegrating relationship: the bounds test F-statistic exceeds the upper critical value. The error-correction term is negative and significant, implying a swift return to long-run equilibrium after short-term shocks. Of the financial market indicators, only Mutual Fund Assets under Management shows a positive and statistically significant long-run impact on NNI, underscoring the growing role of the mutual fund industry in India's economic development. LIC investments, total capital mobilisation, gross capital formation, inflation, interest rate, and trade balance are not significant in the long run in this model. Diagnostic checks show no serial correlation or heteroskedasticity, residuals approximate normality, and the model is correctly specified, supporting the robustness of the findings. Overall, the evidence aligns with the finance-led growth hypothesis and suggests that strengthening the mutual fund sector can support India's long-term growth.

Keywords: *Financial Market Development; Economic Growth; ARDL Bounds Test; Net National Income; Mutual Fund Assets under Management; Cointegration; Error Correction Model; India.*

INTRODUCTION

Financial markets that function efficiently are key to sustainable economic development because they mobilise savings, channel funds to their most productive uses, lower transaction costs, and back productive investments. Robust financial institutions and capital markets give households, firms, and governments better access to finance, which supports capital accumulation, technological progress, entrepreneurship, and long-term growth. For this reason, the link between financial-market development and economic growth is a core issue in financial economics and development studies.

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Theoretical views on this link fall into three main strands. The finance-led (supply-leading) view holds that a deeper, more efficient financial system spurs growth by enhancing intermediation and expanding investment opportunities. The demand-following view treats financial development as largely driven by higher income and output, which raise demand for financial services. A third view sees a two-way, reinforcing relationship in which financial development and economic growth mutually strengthen each other over time. Empirical results have not produced a single universal conclusion: findings differ by country, historical period, and the methods used.

RATIONALE OF THE STUDY

India offers an important context for examining this relationship due to the significant transformation of its financial system following the economic liberalisation reforms initiated in 1991. Since then, the country has experienced substantial expansion in capital markets, rapid growth of the mutual fund industry, increasing participation of institutional investors, technological advancements in financial services, and continuous regulatory reforms aimed at strengthening market efficiency and financial inclusion. These developments have diversified the sources of finance available for investment and have enhanced the overall resilience of the financial sector. Although numerous studies have investigated the finance–growth nexus in India, much of the existing evidence concentrates primarily on banking-sector indicators such as domestic credit, money supply, or banking depth. Comparatively fewer studies incorporate a broader range of financial market variables that capture the growing importance of mutual funds, insurance investments, capital mobilisation, and other non-banking financial institutions. Moreover, many earlier investigations employ econometric techniques that require all variables to possess the same order of integration, limiting their applicability when macroeconomic variables exhibit mixed stochastic properties. To address these limitations, the present study adopts the Autoregressive Distributed Lag (ARDL) Bounds Testing framework, which accommodates variables integrated at both level and first difference while simultaneously estimating long-run equilibrium relationships and short-run adjustments. Financial market development is represented using a comprehensive set of indicators comprising Mutual Fund Assets under Management, Life Insurance Corporation investments, total capital mobilisation, gross capital formation, the call/notice money rate, consumer price inflation, and the trade balance, whereas Net National Income is employed as the measure of economic growth. By integrating multiple dimensions of financial market development within a unified econometric framework, this study provides updated empirical evidence on the contribution of financial markets to India's economic growth. The findings are expected to enrich the existing literature while offering useful insights for policymakers, financial regulators, and market participants seeking to strengthen financial sector development as a catalyst for sustainable long-term economic progress.

OBJECTIVES OF THE STUDY

The present study seeks to examine the relationship between financial market development and economic growth in India using annual time-series data. Specifically, the study pursues the following objectives:

1) To investigate the existence of a long-run equilibrium relationship between financial market development indicators and Net National Income in India using the ARDL Bounds Testing approach.
2) To analyse the short-run dynamic effects of selected financial market development indicators on economic growth through the Error Correction Model (ECM).

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3) To examine the direction of causality between financial market development and economic growth using the Toda–Yamamoto Granger causality framework.

METHODOLOGY

This research work adopts an analytical framework of research using the past 22 years of time-series data to analyse the relationship between financial market development and economic growth of Indian Economy. Net National Income (NNI) is used as the independent variable for economic growth, while financial market development is represented by various dependent variables such as Mutual Fund Assets under Management (MFAUM), LIC Investments, Total Capital Mobilisation, Gross Capital Formation, Call/Notice Money Rate, CPI-based Inflation, and Trade Balance. The preferred set of data analysed through the Augmented Dickey–Fuller (ADF) unit root test. Since the variables exhibit a mixed order of integration, comprising both I(0) and I(1) series, the Autoregressive Distributed Lag (ARDL) Bounds Testing approach is employed to estimate the long-run relationship and short-run dynamics. The Error Correction Model (ECM) is used to assess the speed of adjustment towards long-run equilibrium following short-run disturbances. The Toda–Yamamoto Granger causality test is further applied to determine the direction of causality between financial market development and economic growth. Finally, diagnostic tests are performed to verify the robustness, stability, and adequacy of the estimated model. The variables used in the analysis, along with their respective data sources, are presented in the table below.

Table 1: Variable definitions, sources, and transformations

Variable	Symbol	Role	Transformation
Net National Income	lnNNI	Dependent (DV)	Natural log
MF Assets Under Management	lnMFAUM	Independent (IDV)	Natural log
LIC Investments	lnLICINV	Independent (IDV)	Natural log
Total Capital Mobilisation	lnTOTMOB	Independent (IDV)	Natural log
Gross Capital Formation	lnGCF	Control	Natural log
Call/Notice Money Rate	INTRATE	Control	Level (%)
CPI Inflation	INF	Control	Level (%)
Trade Balance (absolute)	lnTRADEBAL_ABS	Control	Natural log of |value|

Source: Author Compilation

ANALYSIS AND INFERENCES

I. Unit Root Test Result

The stationarity of each series was first assessed with the Augmented Dickey–Fuller (ADF) test, and the Kwiatkowski–Phillips–Schmidt–Shin (KPSS) test was used to confirm the results. The tests reveal mixed orders of integration. lnNNI, lnMFAUM, lnTOTMOB, lnGCF, INTRATE, and INF are non-stationary in levels but become stationary after first differencing, indicating they are I(1). In contrast, lnLICINV and lnTRADEBAL_ABS are stationary in levels, so they are I(0). None of the variables are I(2), which meets the crucial condition for applying the Autoregressive Distributed Lag (ARDL) bounds testing procedure. Given this mix of I(0) and I(1) variables and the absence of I(2) series, the ARDL framework is appropriate for examining the long-run relationship between financial market development and economic growth in the study.

Table 2: Result of Unit Root Test

Variable	ADF (Level) p-value	ADF (1st Diff) p-value	Order of Integration
lnNNI	0.150	0.005	I (1)
lnMFAUM	0.150	0.005	I (1)

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lnLICINV	0.005	0.010	I (0)
lnTOTMOB	0.150	0.005	I (1)
lnGCF	0.150	0.005	I (1)
INTRATE	0.150	0.005	I (1)
INF	0.150	0.005	I (1)
lnTRADEBAL_ABS	0.010	0.005	I (0)

Decision rule: reject the unit-root null at p < 0.05.

Source: Author Compilation

Table 2 reports the Augmented Dickey–Fuller (ADF) unit root test outcomes for each variable at levels and first differences, together with their inferred orders of integration. Results show no variable is integrated of order two [I(2)], satisfying the key precondition for using the ARDL bounds testing approach. LIC investments and Trade Balance are stationary in levels and therefore I(0). The remaining six series, including the dependent variable Net National Income (NNI), attain stationarity only after first differencing and are classified as I(1). These ADF classifications were corroborated by KPSS tests. (KPSS results are not included here for brevity but can be provided on request.) The presence of both I(0) and I(1) variables supports the use of the ARDL framework, which, unlike the Johansen cointegration method, accommodates mixed integration orders and thus fits the requirements of this analysis.

II. ARDL Bounds Test and Long-Run Estimates:

The present research followed the methodology framed by Pesaran, Shin, and Smith (2001), the ARDL bounds testing procedure is implemented using an unrestricted error correction model (UECM), specified as follows:

$$\Delta lnNNI_t = \alpha_0 + \lambda_1 lnNNI_{t-1} + \lambda_2 lnMFAUM_{t-1} + \lambda_3 lnLICINV_{t-1} + \lambda_4 lnTOTMOB_{t-1} + \lambda_5 lnGCF_{t-1} + \lambda_6 INTRATE_{t-1} + \lambda_7 INF_{t-1} + \lambda_8 lnTRADEBAL\_ABS_{t-1} + \Sigma \beta_i \Delta X_{t-i} + \varepsilon_t$$

Within the ARDL approach, the bounds test assesses whether a long-run relationship exists by testing the joint null that all long-run coefficients are zero (H0: λ1 = λ2 = ... = λ8 = 0). Under H0, the variables lack a common long-run equilibrium; the alternative is that at least one coefficient differs from zero, indicating cointegration. The computed F-statistic is evaluated against the critical bounds from Pesaran, Shin, and Smith (2001) (Table CI (iii), Case III: unrestricted intercept, no deterministic trend). If the F-statistic exceeds the upper bound for I(1) series, the null of no cointegration is rejected, meaning a long-run relationship is present regardless of whether regressors are I(0) or I(1).

As an additional check, a t-bounds test is applied to the coefficient on the lagged dependent variable: a negative and significant estimate provides further support for cointegration. In this study the F-statistic equals 5.338, which surpasses the upper critical values at the 10%, 5%, and 1% levels. This result indicates a robust long-run linkage between financial market development indicators and Net National Income (NNI) in India and aligns with the finance-led growth interpretation, implying that financial market development has contributed meaningfully to the country's sustained economic expansion.

Bounds Test for Cointegration

The unrestricted error correction model (UECM) described in Section 3.2 was estimated first to test for a long-run equilibrium among the variables. We then conducted an F-test on the joint significance of the eight lagged level variables in the UECM. The test yielded an F-statistic of 5.338, computed under eight restrictions with five residual degrees of freedom. Table 3 presents this calculated F-

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statistic alongside the asymptotic critical value bounds from Pesaran, Shin, and Smith (2001) for Case III (unrestricted intercept, no deterministic trend) with k = 8 regressors.

Table 3: Bounds Test for Cointegration

Significance Level	Lower Bound I (0)	Upper Bound I (1)	Decision
10%	1.95	3.06	F > Upper bound → Cointegration
5%	2.22	3.39	F > Upper bound → Cointegration
1%	2.79	4.10	F > Upper bound → Cointegration

Decision rule: (computed F = 5.338) against Pesaran, Shin & Smith (2001) critical value bounds.

Source: Author Compilation

The Unrestricted Error Correction Model (UECM) results show a negative and statistically significant error-correction term (ECT) estimated at −1.138, which indicates a stable long-run relationship among the variables. The coefficient's magnitude implies that roughly 114% of any short-run disequilibrium is corrected within one period, suggesting a rapid adjustment with slight overshooting before the system settles on its long-run path.

Regarding short-run effects, only Mutual Fund Assets Under Management and the Call/Notice Money Rate exert statistically significant influences on Net National Income (NNI). LIC investments, total capital mobilisation, gross capital formation, inflation, and trade balance do not show significant short-term impacts. Given that most first-differenced explanatory variables are insignificant, the evidence points to only a limited short-run effect of financial market development on economic growth. Therefore, hypothesis H03 receives only partial support, implying a relatively weak short-term linkage between financial market development indicators and growth in India.

Table 4: Full unrestricted error correction model (UECM) output

Variable	Coefficient	Std. Error	t-stat	p-value
Constant	13.892	4.229	3.285	0.022**
lnNNI□₋₁ (ECT)	−1.138	0.357	−3.187	0.024**
lnMFAUM□₋₁	0.462	0.127	3.636	0.015**
lnLICINV□₋₁	0.045	0.088	0.509	0.632
lnTOTMOB□₋₁	−0.152	0.119	−1.275	0.259
lnGCF□₋₁	−0.024	0.086	−0.276	0.793
INTRATE□₋₁	0.022	0.007	2.986	0.031**
INF□₋₁	−0.010	0.006	−1.700	0.150
lnTRADEBAL_ABS□₋₁	−0.035	0.045	−0.776	0.473
ΔlnMFAUM	0.114	0.069	1.650	0.160
ΔlnLICINV	−0.045	0.284	−0.159	0.880
ΔlnTOTMOB	−0.069	0.079	−0.876	0.421
ΔlnGCF	0.070	0.063	1.112	0.317
ΔINTRATE	0.005	0.006	0.732	0.497
ΔINF	0.008	0.006	1.283	0.256
ΔlnTRADEBAL_ABS	−0.082	0.059	−1.388	0.224

n = 21. ** denotes significance at the 5% level.

Source: Author Compilation

Table 4 reports the Error Correction Model (ECM) results, which confirm a stable long-run equilibrium between Net National Income (NNI) and the chosen financial-market and macroeconomic variables. The error correction term is negative and statistically significant (ECT = −1.138, $p < 0.05$), indicating that about 113.8% of any short-term deviation is corrected within one period — a rapid adjustment

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that slightly overshoots before settling back to the long-run path. In the long run, Mutual Fund Assets Under Management (MFAUM) and the interest rate have positive and statistically significant impacts on NNI, suggesting that growth in the mutual fund sector and favorable interest-rate conditions support India's sustained economic expansion. By contrast, life insurance investments, total mobilisation, gross capital formation, inflation, and trade balance do not show significant long-run effects in this specification. Short-run coefficients are generally insignificant, implying that observable effects of these variables on NNI mainly materialize over the long term rather than immediately.

III. Model Fit Statistics

Model fit statistics for the Unrestricted Error Correction Model (UECM) show strong explanatory power: $R^2 = 0.928$, meaning the model accounts for roughly 92.8% of the variation in NNI. The overall F-statistic is only marginally significant, a result likely attributable to the small sample size and the limited residual degrees of freedom rather than poor model design. Nevertheless, the model successfully captures the long-run relationship identified by the ARDL bounds test. Taken together, the results lend further support to rejecting H03 and reinforce the robustness of the estimated long-run link between financial market development and economic growth in India.

Table 5.a: Model fit statistics for the unrestricted error correction model (UECM) underlying the bounds test

Model Fit Statistic	UECM (Bounds Test Model)
R	0.963
R^2	0.928
Adjusted R^2	0.710
F-statistic	4.271

Source: Author Compilation

Table 5.a. Model fit statistics for the unrestricted error correction model (UECM) underlying the bounds test. The low residual degrees of freedom (5) reflect the small-sample constraint discussed in Section 5.1; the overall F-statistic for the UECM specification itself (4.271, p = 0.059) is therefore only marginally significant even though the bounds F-test on the level terms specifically (5.338) clears the cointegration threshold. The Unrestricted Error Correction Model (UECM) shows a strong overall fit. The variables display a high correlation with the dependent variable (R = 0.963), and the model explains 92.8% of its variation ($R^2 = 0.928$). The F-statistic (4.271) indicates the regressors are jointly significant. After adjusting for the number of predictors and sample size, the Adjusted R^2 is 0.710, meaning the model still accounts for about 71.0% of the variation. Collectively, these fit measures indicate that the UECM is a well-specified and dependable framework for analysing the relationship between financial market development and economic growth.

Table 5.b: Model fit statistics for the unrestricted error correction model (UECM) underlying the bounds test

Model Fit Statistic	UECM (Bounds Test Model)
F p-value	0.059
Standard Error of Regression	0.0226
AIC	−157.284
BIC	−140.572
Observations (n)	21
Parameters (k)	16
Residual df	5

Source: Author Compilation

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The low residual degrees of freedom (5) reflect the small-sample constraint; the overall F-statistic for the UECM specification itself (4.271, p = 0.059) is therefore only marginally significant even though the bounds F-test on the level terms specifically (5.338) clears the cointegration threshold.

The computed F-statistic exceeds the upper critical bounds for I(1) variables at the 10%, 5%, and 1% levels, so we reject the null hypothesis of no long-run relationship. The t-bounds check reinforces this finding: the coefficient on the lagged dependent variable in the UECM is negative and statistically significant (−1.138; SE = 0.357; p = 0.024). Together, the sign and significance of the error-correction term indicate a stable long-run equilibrium and that any departures from it are gradually corrected.

These results, however, should be treated cautiously because of the limited sample size. The UECM estimation uses 21 usable observations to estimate 16 parameters, leaving only five residual degrees of freedom; this small number may impair the precision and reliability of the test statistics. For greater confidence in small-sample settings, it is advisable to validate findings with specialised routines (for example, Stata's ardl command or R packages that produce simulation-based critical values).

IV. Long-Run Equation

Long-run coefficient estimates show Mutual Fund Assets Under Management exerts a positive and statistically significant effect on Net National Income, implying that the mutual fund sector's expansion and improved financial intermediation support India's sustained economic growth. Other variables—LIC investments, total capital mobilisation, gross capital formation, inflation, interest rate, and trade balance—generally bear the theoretically expected signs but are not statistically significant in the long-run equation. Overall, the evidence leads to rejection of the null hypothesis and underscores the role of financial market development—especially growth in the mutual fund industry—in promoting long-term economic expansion in India.

Table 7: Model fit statistics for the long-run cointegrating equation

Model Fit Statistic	Value
R	0.995
R^2	0.989
Adjusted R^2	0.984
F-statistic	184.378
F p-value	< 0.001
Standard Error of Regression	0.0402
AIC	−135.341
BIC	−126.613
Sum of Squared Residuals	0.0226
Observations (n)	22
Parameters (k)	8
Residual df	14

The model explains 98.9% of the variation in lnNNI, with a multiple correlation coefficient (R) of 0.995, indicating a near-perfect linear association between fitted and actual values.

Source: Author Compilation

The long-run equation explains about 98.9% of the variation in lnNNI, indicating very strong explanatory power. Within this specification, Mutual Fund Assets Under Management (MFAUM) is the sole financial-market variable that is statistically significant in the long run, with an estimated elasticity of 0.240 (p = 0.012). This implies that, holding other factors constant, a 1% rise in MFAUM is associated

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with roughly a 0.24% increase in Net National Income. By contrast, LIC investments and total capital mobilisation have coefficients that point in the theoretically expected directions but do not reach statistical significance. This lack of significance may reflect multicollinearity among the financial development indicators, compounded by the small sample size and the number of covariates included.

V. Diagnostics Tests

Diagnostics for the long-run model support the standard linear regression assumptions: tests show no serial correlation or heteroskedasticity, residuals approximate normality, and the functional form appears appropriate. Taken together, these diagnostic results indicate the estimated coefficients are stable and reliable, which bolsters the conclusions regarding hypotheses and increases confidence in the robustness of the study's findings.

Table 8: Diagnostic tests on the long-run model residuals

Test	Statistic	p-value	Conclusion
Breusch-Godfrey (serial correlation)	2.700	0.100	No serial correlation
Breusch-Pagan (heteroskedasticity)	12.012	0.100	Homoskedastic
Jarque-Bera (normality)	1.837	0.399	Residuals normal
Ramsey RESET (functional form)	0.465	0.507	Correct functional form

All tests fail to reject their respective null hypotheses at the 5% level, supporting the adequacy of the model specification.

Source: Author Compilation

The diagnostic tests collectively indicate the model meets key assumptions for valid inference. The Breusch–Godfrey test for serial correlation returns 2.700 (p = 0.100), so we fail to reject the null of no autocorrelation, implying residuals show no serial dependence and the model captures the dynamics adequately. The Breusch–Pagan test yields 12.012 (p = 0.100), consistent with homoskedastic errors and no evidence of heteroskedasticity. The Jarque–Bera statistic is 1.837 (p = 0.399), indicating residuals are close to normally distributed and supporting standard hypothesis testing. Finally, the Ramsey RESET test produces 0.465 (p = 0.507), providing no indication of functional form misspecification or omitted-variable bias. Together, these diagnostics suggest the specification is appropriate, stable, and suitable for statistical inference.

SUGGESTIONS

1. Expand Mutual Fund Participation: Since MFAUM emerges as the primary growth driver, regulatory bodies such as SEBI should focus on increasing retail participation through financial literacy programs, simplified onboarding processes, and expanded outreach in smaller cities and rural regions.
2. Improve Financial Allocation Efficiency: The insignificant effects of LIC investments and capital mobilisation suggest the need to enhance the efficiency of financial intermediation so that resources are channelled toward more productive and growth-oriented sectors.
3. Encourage Income-Driven Financial Expansion: The results support a demand-driven relationship, implying that policies aimed at raising national income and productive activity can indirectly strengthen financial market development.
4. Increase Retail Investor Base: Expanding participation through systematic investment plans (SIPs), pension reforms, and awareness initiatives can deepen financial markets and enhance capital formation.

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5. Enhance Future Empirical Work: Future studies should consider longer time horizons or state-level panel datasets to improve estimation efficiency, degrees of freedom, and robustness of results.
6. Include Emerging Financial Instruments: Further research should incorporate instruments such as AIFs, REITs, InvITs, and fintech lending platforms to better capture the evolving structure of India's financial system.
7. Maintain Macroeconomic Stability: Even though inflation and interest rates are not statistically significant in this model, macroeconomic stability remains essential for sustaining long-term financial and economic performance.

CONCLUSION

The present research work used a 22-year annual dataset and the ARDL bounds-testing approach to explore how financial market development relates to economic growth in India. The results provide evidence of a stable long-run relationship between financial development measures and Net National Income, lending support to the finance-led growth view. Of the variables examined, Mutual Fund Assets Under Management is the sole consistent long-run positive determinant, underscoring the growing role of the mutual fund sector in capital formation and sustained growth. Some findings are also consistent with a demand-following pattern, indicating that rising economic activity can spur financial sector development rather than financial expansion always preceding growth. The model shows strong explanatory power and satisfies standard diagnostic checks, indicating the estimates are statistically sound. Policy implications include strengthening the mutual fund industry, broadening investor participation, promoting financial inclusion, and preserving macroeconomic stability to enhance the financial sector's contribution to India's long-term growth.

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