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Banking Industry Development and Economic Growth in India: Evidence from Post-Reform Time-Series Data

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Abstract: The expansion of banking is generally expected to support economic development by mobilising savings, improving credit allocation and financing productive investment. However, an increase in bank credit does not necessarily translate automatically into higher economic growth. This paper examines the relationship between banking industry development and economic growth in India during the post-liberalisation period. Annual data for 1991–2020 are used, with real GDP growth representing economic performance and domestic credit to the private sector by banks as a percentage of GDP representing banking development. Gross capital formation and inflation are incorporated as macroeconomic controls. Because credit and investment ratios display persistent trends, their annual changes are used in the principal regression. Heteroskedasticity-robust ordinary least squares, diagnostic tests and Granger-causality tests are employed. The findings show that annual changes in bank-credit depth do not have a statistically significant direct effect on GDP growth. Changes in gross capital formation, however, show a positive and significant relationship with growth. Granger-causality tests further indicate that GDP growth predicts subsequent changes in bank-credit depth, whereas changes in bank credit do not predict GDP growth. The results therefore provide greater support for a demand-following interpretation of financial development in India. The paper concludes that banking remains important for development, but its contribution depends on credit quality, productive allocation and the conversion of financial resources into investment rather than on credit expansion alone.

Keywords: *Banking Development, Economic Growth, Bank Credit, Financial Development, Capital Formation, India.*

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I. INTRODUCTION

Banks occupy a central position in India's financial architecture. They mobilise household and corporate savings, extend credit, facilitate payments and transfer financial resources from surplus units to sectors requiring funds for consumption and investment. These functions create an obvious theoretical connection between banking development and economic growth.

The finance-growth literature has traditionally argued that efficient financial intermediaries can promote growth by identifying productive projects, reducing information costs, monitoring borrowers, managing risk and facilitating capital accumulation. King and Levine (1993) found a strong association between financial development and subsequent economic growth across countries. Levine (1997) similarly argued that financial institutions influence growth through savings mobilisation, resource allocation, corporate monitoring and risk management. Rajan and Zingales (1998) demonstrated that industries dependent on external finance tend to grow faster where financial systems are relatively developed.

The direction of the relationship, however, remains disputed. Financial development may stimulate economic expansion—the supply-leading argument—but rising economic activity can itself increase demand for deposits, loans and financial services. The latter represents the demand-following hypothesis. International time-series evidence has shown that both patterns occur and that causality varies across economies.

India is particularly suitable for such an examination. The reforms initiated in 1991 altered the operating environment of banks through deregulation, prudential regulation, competition,

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private-sector participation, technological adoption and subsequent financial-inclusion initiatives. Credit penetration expanded substantially over the following decades.

Yet the quantity of bank lending is not synonymous with productive financial development. Credit extended to efficient firms and viable investment projects can raise output, whereas poor lending decisions can generate non-performing assets and weaken financial institutions.

Recent research on India reinforces this distinction. MacDonald and Xu (2022) found that credit growth generated by better-capitalised banks with lower levels of non-performing loans is associated with stronger long-run growth. Hence, the economic effect of lending may depend on the strength of the originating bank and the quality of credit rather than on lending volume alone.

Against this background, the present study examines whether banking-sector deepening has independently contributed to economic growth in post-reform India and investigates the direction of predictive causality between growth and bank credit.

II. LITERATURE REVIEW AND RESEARCH GAP

The theoretical foundation of the finance-growth relationship can be traced to the proposition that financial intermediaries improve the efficiency with which savings are transformed into investment. King and Levine (1993) provided influential empirical support for this argument, finding that financial development was associated with economic growth, capital accumulation and efficiency improvements.

Levine (1997) developed a broader framework in which financial systems affect economic activity through information acquisition, monitoring, risk diversification, mobilisation of savings and facilitation of exchange. Financial development therefore influences not only the volume of capital but also its allocation.

Rajan and Zingales (1998) offered another important explanation. Their findings showed that industries requiring external finance grew disproportionately faster in economies possessing more developed financial markets. Financial development can thus promote growth by easing financing constraints.

Nevertheless, the causal direction remains unsettled. Demetriades and Hussein (1996), using time-series evidence from several countries, found considerable evidence of reverse and bidirectional relationships. Their findings suggest that the relationship is country-specific rather than universal.

Indian research has produced similarly diverse results. Bhattacharya and Sivasubramanian (2003) examined India between 1970–71 and 1998–99 and found that broad money, used as an indicator of financial development, led economic growth. This supported the supply-leading hypothesis.

Chakraborty (2008), however, reported a stable long-run relationship involving bank credit, stock-market development and real economic activity but found important evidence consistent with economic growth contributing to financial development. The contrast between these findings indicates that conclusions may depend on the financial indicator, sample period and econometric methodology employed.

The quality of banking has received increasing attention. MacDonald and Xu (2022) show that, in India, the growth implications of credit depend significantly on bank capitalisation and asset quality. The finding is important because it shifts attention away from aggregate credit alone.

Another strand of literature questions whether continuously expanding financial depth is always beneficial. Arcand, Berkes and Panizza (2015) demonstrate that finance can exhibit diminishing benefits at sufficiently high levels. While India is not necessarily an example of excessive financialization, the broader implication is that financial depth and developmental effectiveness should not be treated as identical.

The present study contributes in three ways. First, it focuses specifically on the post-1991 Indian economy. Second, it distinguishes changes in bank-credit depth from changes in actual capital formation. Third, it tests the direction of predictive causality between economic growth and bank-credit deepening.

III. OBJECTIVES AND HYPOTHESES

The objectives are:

- To examine the relationship between banking industry development and economic growth in India.
- To estimate whether increases in private-sector bank-credit depth significantly influence GDP growth.
- To assess the contribution of capital formation to economic growth.
- To determine the direction of predictive causality between economic growth and banking development.
- To derive policy implications for the role of Indian banks in economic development.

The principal hypotheses are:

- H01: Changes in banking development have no statistically significant relationship with economic growth in India.
- H11: Changes in banking development have a statistically significant relationship with economic growth in India.
- H02: Changes in gross capital formation have no statistically significant relationship with economic growth.
- H12: Changes in gross capital formation have a statistically significant relationship with economic growth.

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For causality:

- H03: Changes in bank-credit depth do not Granger-cause GDP growth.
- H04: GDP growth does not Granger-cause changes in bank-credit depth.

IV. RESEARCH METHODOLOGY

➢ *Data and Period*

The study uses annual data for **1991–2020**. The period begins with India's major economic reform programme and provides a sufficiently long post-reform time series while preserving a common data period across the selected indicators.

Data originate from the World Bank's *World Development Indicators*, supplemented by Reserve Bank of India statistical publications for institutional verification.

Table 1 The variables

Variable	Symbol	Measurement
Economic growth	GDPG	Real GDP growth, annual %
Banking development	CREDIT	Domestic credit to private sector by banks, % of GDP
Capital formation	GCF	Gross capital formation, % of GDP
Inflation	INF	Consumer-price inflation, annual %
Financial-crisis shock	GFC	1 for 2008; 0 otherwise
COVID shock	COVID	1 for 2020; 0 otherwise

The World Bank series codes are NY.GDP.MKTP.KD.ZG, FD.AST.PRVT.GD.ZS, NE.GDI.TOTL.ZS and FP.CPI.TOTL.ZG, respectively.

Bank credit as a percentage of GDP is selected because it captures the financial resources supplied to private-sector borrowers by deposit-taking institutions. Gross capital formation is included to distinguish expansion in financial resources from their conversion into productive assets.

➢ *Model Specification*

Preliminary time-series diagnostics indicate considerable persistence in CREDIT and GCF. Consequently, annual changes in these ratios are used in the primary regression rather than treating trending level variables as stationary.

The estimated model is:

$$\mathbf{GDPG_t = \alpha + \beta_1 \Delta CREDIT_t + \beta_2 \Delta GCF_t + \beta_3 INF_t + \beta_4 GFC_t + \beta_5 COVID_t + \varepsilon_t}$$

where Δ represents the annual change.

Heteroskedasticity-robust standard errors are used.

The COVID dummy captures the exceptional 2020 output contraction. The GFC dummy captures the significant international financial disturbance in 2008.

Granger-causality tests are additionally performed on the pre-COVID sample to investigate whether changes in bank-credit depth predict GDP growth or whether GDP growth predicts subsequent changes in credit depth. Granger causality is interpreted as predictive precedence and not as proof of structural causation.

V. EMPIRICAL RESULTS

➢ *Descriptive Statistics*

Table 2. Descriptive Statistics, 1991–2020

Variable	Mean	Std. Dev.	Minimum	Maximum
GDP growth (%)	5.81	3.12	-7.25	8.85
Bank credit (% GDP)	38.72	12.21	22.51	54.80
Gross capital formation (% GDP)	31.78	5.47	23.97	41.93
Inflation (%)	7.24	3.24	3.33	13.87

Average GDP growth during the study period was approximately 5.81 per cent. The minimum of -7.25 per cent occurred in 2020 and reflects the extraordinary pandemic-related contraction.

Bank-credit depth rose considerably over the post-reform period. Its average was 38.72 per cent of GDP, with substantial variation across years.

Gross capital formation averaged 31.78 per cent of GDP, indicating the importance of investment in India's growth process.

➢ *Correlation*

The simple correlation between GDP growth and the level of bank credit is approximately **-0.06**, suggesting almost no unconditional linear relationship. GDP growth and gross capital formation show a stronger positive correlation of approximately **0.31**.

Credit and gross capital formation are positively correlated, which is economically reasonable because banks can facilitate investment financing. Correlation alone, however, cannot distinguish their separate effects.

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➢ *Regression Results*

Table 3. Robust OLS Results

Variable	Coefficient	Robust Std. Error	p-value
Constant	6.106	0.902	<0.001
Δ Bank credit	-0.092	0.210	0.661
Δ Gross capital formation	**0.264**	0.133	**0.048**
Inflation	0.063	0.100	0.531
Global financial crisis	-2.100	1.091	0.054
COVID-19	**-12.977**	0.984	**<0.001**

Observations = 29
R^2 = 0.779
Adjusted R^2 = 0.730
Durbin-Watson = 1.565

The coefficient of the change in bank-credit depth is negative but statistically insignificant (p = 0.661). Accordingly, the analysis does not provide evidence that an annual increase in bank credit relative to GDP independently raises contemporaneous GDP growth.

H01 is therefore not rejected.

The change in gross capital formation has a positive coefficient of approximately **0.264** and is statistically significant at the 5 per cent level. Other things being equal, a one-percentage-point increase in the gross-capital-formation ratio is associated with approximately a 0.26-percentage-point increase in GDP growth.

H02 is rejected in favour of H12.

Inflation is not statistically significant in this specification.

The GFC dummy is negative and marginally significant, whereas the COVID dummy is strongly negative and highly significant. The magnitude of the COVID coefficient reflects the exceptional nature of the 2020 contraction.

➢ *Diagnostic Tests*

The regression performs satisfactorily on conventional diagnostic tests.

Table 4

Diagnostic	p-value/result
Breusch-Pagan heteroskedasticity test	0.581
Breusch-Godfrey serial-correlation test	0.324
Jarque-Bera normality test	0.533
Maximum VIF	1.49

The null hypotheses of homoskedasticity, absence of serial correlation and residual normality are not rejected. The maximum variance inflation factor is well below conventional thresholds for problematic multicollinearity.

A robustness regression using the variables in levels and controlling for the two shocks produces the same substantive conclusion. Bank credit remains statistically insignificant (β = -0.032; p = 0.436), while gross capital formation remains positive and significant (β = 0.218; p = 0.008).

The principal result is therefore not dependent on using either levels or annual changes.

VI. GRANGER-CAUSALITY ANALYSIS

A particularly important result emerges from the direction-of-causality tests.

Table5. Granger-Causality Results

Null Hypothesis	Lag	F-statistic	p-value	Decision
ΔCredit does not Granger-cause GDP growth	1	0.155	0.697	Do not reject
ΔCredit does not Granger-cause GDP growth	2	0.011	0.989	Do not reject
GDP growth does not Granger-cause ΔCredit	1	5.097	**0.033**	Reject
GDP growth does not Granger-cause ΔCredit	2	4.052	**0.032**	Reject

Changes in bank-credit depth do not predict GDP growth at either one- or two-year lags.

In the opposite direction, GDP growth significantly predicts subsequent changes in bank-credit depth at both lag lengths.

The results therefore provide evidence more consistent with the demand-following hypothesis than with a simple supply-leading interpretation.

Economic expansion raises household income, business activity, investment requirements and demand for financial services. Banks consequently expand their lending activities in response to a growing real economy.

This does not imply that banking is unimportant. Rather, the direction of predictive causality suggests that aggregate credit expansion may frequently respond to economic opportunities rather than independently generating them.

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VII. DISCUSSION

The results qualify the conventional assumption that more banking automatically produces more growth.

Bank credit plays a crucial financing role, but the quantity of lending is only one aspect of financial development. The economic effect of a loan depends on where the funds are allocated, the productivity of the borrower and the financial condition of the lending institution.

The significant capital-formation result is especially important. It suggests that the link between banking and growth may operate primarily through the conversion of finance into productive assets.

A plausible transmission channel is:

Banking intermediation → Availability of finance → Productive investment → Capital formation → Output growth

Credit that finances productive machinery, infrastructure, technology or viable enterprise expansion can increase productive capacity. An equivalent amount of poorly allocated credit may generate limited additional output and can eventually become a non-performing asset.

The results are consistent with MacDonald and Xu's (2022) observation that higher credit growth from better-capitalised Indian banks with lower NPLs is associated with stronger long-term growth.

The Granger findings also contribute to the mixed Indian literature. Bhattacharya and Sivasubramanian (2003) previously found evidence of finance-led growth using broad money, whereas Chakraborty (2008) found evidence suggesting an important role for growth in driving financial development.

The present findings support the latter interpretation when private-sector bank-credit depth is used as the financial-development indicator.

VIII. POLICY IMPLICATIONS

Three policy conclusions follow.

First, banking policy should place greater emphasis on credit quality and allocation, rather than treating rapid loan growth as an end in itself. Growth in lending is beneficial when borrowers generate sufficient productive returns to service debt and expand output.

Second, banks should strengthen the transmission from finance to capital formation. Credit directed towards commercially viable MSMEs, manufacturing, infrastructure, logistics, technology and other productivity-enhancing sectors can create stronger growth effects.

Third, healthy bank balance sheets are essential. Capital adequacy, sound underwriting, timely recognition of stressed loans and effective monitoring allow financial institutions to support the economy sustainably.

Financial inclusion should similarly progress from account ownership towards meaningful use of formal savings, payments and productive credit.

IX. CONCLUSION

This study examined the relationship between banking industry development and economic growth in India using post-reform annual data.

The empirical evidence shows that increases in private-sector bank credit relative to GDP do not have a statistically significant direct relationship with annual GDP growth after capital formation, inflation and major macroeconomic shocks are considered.

Gross capital formation, in contrast, has a positive and significant relationship with growth.

The Granger-causality analysis produces an additional finding: GDP growth predicts subsequent changes in bank-credit depth, whereas changes in bank-credit depth do not predict GDP growth. The evidence therefore favours a demand-following interpretation of the Indian banking-growth relationship over the period examined.

The findings should not be interpreted to mean that banking does not contribute to development. They instead demonstrate that banking development is economically meaningful when financial resources are transformed into productive investment.

For India, the objective should therefore not simply be a larger volume of credit. A stronger developmental banking system is one that allocates finance efficiently, maintains healthy balance sheets and supports the creation of productive capacity.

Future research can extend the study by incorporating bank asset quality, deposits, branch penetration, financial inclusion, digital banking and sector-wise credit. Quarterly data may also permit more sophisticated dynamic modelling.

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