JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue
JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)
An International Scholarly Open Access, Peer-reviewed, Refereed Journal

ECONOMIC GROWTH AND BANKING NEXUS IN INDIA AN ARDL APPROACH

Mrs. Gargi Sharma, Dr. J.N. Sharma
Research Scholar, Professor of Economics
Department of Economics
IIS (Deemed to be) University, Jaipur, India

Abstract

The aim of this study is to investigate the relationship between economic growth and the Indian banking industry by evaluating time series data from 1990 to 2022. The Optimal Lag length criterion, the Bounds test, the Error Correction Mechanism, the Diagnostics statistics, the ADF and PP Unit Root tests, and the Bounds test have all been considered in the application of the Autoregressive Distributed Lag approach to achieve this goal. Additionally, we approximated the models for FMOLS, DOLS, and Canonical co-integrating. Foreign direct investment and gross fixed capital formation serve as the control variables, and the credit deposit ratio, credit accounts, credit amount per account and the number of bank branches have all been examined as independent variables. GDP has been used as a proxy for economic activity. In light of the study's results, it can be said that the variables FDI and GCFN, along with the control variables number of branches, credit deposit ratio, credit accounts, and credit amount per account, all have a statistically significant long-term effect on Economic Growth in India.

Keywords: GDP, ARDL, Statistically significant, Public Sector banks, Co-integration

JEL Classification Code: G21 and O430

Introduction

According to the World Bank, one of the most important things for promoting economic growth in a nation is financial development. Kumar and Paramanik (2020) assert that it is an essential element of the economic development of India. Financial development increases liquidity, facilitates easier access to savings, helps with resource efficiency, and promotes investment, all of which increase economic activity and contribute to the expansion of the economy. A healthy financial sector would assist the accumulation of human and physical capital, boost growth by directing resources to their most advantageous uses (IMF, 2023).

Financial inclusion and economic growth are positively correlated in developing countries such as India [Mohan (2006); Dixit and Ghosh (2013); Sharma (2016)]. Consequently, financial innovation is viewed as a crucial accelerator for financial development, according Laeven et al. (2015).

A country's financial system's effectiveness is a reliable gauge of its overall economic health. It's been said that India's banking sector has made a substantial contribution to the growth of the country and is today quite well-established. The current transformation process in this sector has made it possible for it to grow even stronger and more capable of performing its duties.

In India, public sector banks, in particular, continue to be the main financial intermediaries. Since their nationalization in 1969 and 1980, public sector banks have played a significant role in India's financial industry. Since then, public sector banks have been integral to the industry, supporting initiatives to promote financial inclusion as well as lending to priority industries. Through priority sector financing, the Pradhan Mantri Jan Dhan Yojana basic bank account program, and their extensive networks, which include coverage in rural regions, PSBs have aided the government's attempts to promote financial inclusion.

Initiatives to support financial inclusion, like strengthening the digital payment infrastructure, have played a major role in the growth of India's financial sector. India has developed an extremely sophisticated and efficient digital payment system. One of the key innovations that has increased financial inclusion is the Unified Payments Interface, an interoperable payments platform that encourages innovation and attracts the private sector with new products and technologies to a range of demographic categories.

Since the 18th century (Smith, 1776; Schumpeter, 1911), researchers have been particularly interested in the function of the banking industry. This interest has been widely recognised and documented. Numerous researchers (Khan, 2001; Arestis and Demetriades, 1997; Calderón and Liu, 2003; Greenwood and Jovanovic, 1990; Kyophilavong et al., 2016; Saad, 2014) used a variety of econometric methodologies to examine the relationships between financial development and economic growth and came to a positive conclusion.

Thus, the aim of this article is to explore the connection between the banking sector's expansion and India's economic growth, as well as any possible effects on the country's development and economic growth. This essay follows this structure: Immediately following the introduction, Section II offers a brief evaluation of the body of existing literature. Section III contains mentions of the goals and the hypothesis. In Section IV, the information, variables, and methods used to analyse the relationship between the independent and dependent variables are addressed. Section V discusses the empirical analysis and findings, while Section VI discusses the study's findings and implications.

2. Review of Literature

Numerous scholarly works provide theoretical and empirical explanations for the positive impacts of financial development on economic growth.

Ali et al. (2022) examined a sample of 15 developed and emerging economies between 2005 and 2019 to find the correlation between financial development and economic growth using the ARDL model. GDP, Inflation, Real Interest Rate, Exchange Rate, Trade Openness, and Domestic Credit to Private Sector were the variables taken into consideration in the research. The study's conclusions demonstrate that interest rates, inflation, and domestic loans to the private sector have a substantial and negative impact on GDP growth rates over the long and short terms. On the other hand, trade and exchange rates have a small but beneficial short-term effect on the GDP growth rate. The research findings show that wealthy nations should strengthen their financial systems even though emerging nations must enact new measures in the same direction.

Using the ARDL model, Aziz, Pradhan, and associates (2022) investigated the impact of financial development and the synergistic effects of ICT and financial development on economic growth in 10 Asian rising economies from 2001 to 2017. DOLS and FMOLS confirmed the model's robustness. The results suggest that modern ICT should be incorporated into the economy to promote equitable financial development.

Balasubramanian (2022) examined the impact of total bank loan on economic growth using cross-country research and an autoregressive distributed lag (ARDL) model with control variables. The results imply that there is a long- and short-term equilibrium relationship between total long-term bank loans and overall economic growth.

For the years 1990–2020, Mustafa Hassan Mohammad Alam (2022) looked at the relationship between foreign direct investment, financial development, and sustainable economic growth in Sudan. The research utilized Granger causality, co-integration, ARDL approach, and VAR error correcting technique. FDI inflows, the GDP ratio of the total of imports and exports, and the GDP percentage of domestic credit extended to the banking sector were the variables utilized in his analysis. Although not statistically significant, the long run estimates show that the FDI variable is positive. This outcome runs counter to what my study indicates. The results showed that FDI inflows boost the impact of financial development on economic growth.

Khan et al. (2022) investigated the effects of financial inclusion on financial sustainability, financial efficiency, gross domestic product, and human development in the context of G20 countries using annual data from 15 developed and emerging economies between 2004 and 2017. The results demonstrated that, although inclusive finance has a significant long-term influence on sustainability, there is no immediate association between financial inclusion and sustainability.

Using the ARDL and ECM model techniques, Alam and Alam (2021) looked at the long- and short-term links between financial development, economic growth, and poverty reduction in India from 1960 to 2016. The results show a long-run co-integration relationship between the model's variables, household private final consumption expenditure, broad money as a proportion of GDP, and GDP per capita.

Nazir and Tan (2021) looked at the relationship between financial innovation and economic growth in China, India, and Pakistan between 1970 and 2016. Using an Autoregressive Distributed Lag (ARDL) bound testing and Granger causality-based Error Correction Model (ECM), the study finds that financial innovation has a positive and significant impact on economic growth both in the short-run and long-run.

Zafar (2020) looks at the connection between Pakistan's GDP growth, exports, foreign direct investment, and current account deficit from 1975 to 2016. He used ECM methods with the autoregressive distributed lag (ARDL) co-integration strategy to identify long- and short-term relationships. The results demonstrate a strong positive correlation between exports, foreign direct investment, and economic growth in Pakistan over both the short and long terms. The findings, however, indicate a negative and substantial relationship between the current account deficit and economic growth over the long and short terms.

Kumar and Paramanik (2020) examined the association between financial development and economic growth in India utilizing time-series data, GDP, and the ratio of broad money to GDP as proxies for economic and financial development, respectively. Research indicates that financial development has a positive long-term effect on economic growth, in contrast to its short-term effects.

Mohanthy and Bhanumurthy (2019) examined the dynamic relationships between India's physical infrastructure, financial development, and economic growth using the autoregressive distributed lag and the Toda-Yamamoto causality technique for the years 1980 to 2016. Based on empirical evidence, financial development has a considerable yet small effect on economic growth.

Pradhan et al. (2017) investigated the connection between trade openness, economic development, and the depth of the banking sector using a panel data set that covered the ASEAN region's countries for the years 1961–2012. The analysis discovered a general long-run and short-run relationship between these elements.

Lenka and Sharma (2017) examined the effect of financial inclusion on economic growth in India from 1980 to 2014 using annual time series data on the number of scheduled commercial bank deposit and credit accounts per 1,000 adults, the number of bank branches per 1,000 adults, the number of bank employees as the ratio of bank branches, and the amounts of deposits and credits as the ratio of GDP. With the use of the Error Correction Model (ECM) and Autoregressive Distributed Lag (ARDL), the study concluded that financial inclusion positively affects economic growth over the long and short terms. Laeven and Levine (2015) assert that technological advancement and economic progress will ultimately cease if financiers fail to innovate.

Dixit and Ghosh (2013) argued in their paper that equitable growth opportunities and benefits distribution is necessary to achieve inclusive growth, and that one of the most crucial opportunities for equitable distribution in the country is financial inclusion, which is necessary to achieve comprehensive growth.

From 1994 to 2011, Pradhan and Rudra (2013) investigated the elements that influenced India's long-term financial progress. The investigation made use of unit root, co-integration, ARDL bound test method, and VECM. The results support the hypothesis that the development of the stock market directly causes inflation and economic growth, and they also demonstrate a long-term equilibrium relationship between financial development and growth.

Mishra and Pradhan (2011) investigate the relationship between financial development and economic growth in India from 1960 to 2009 using the vector error correction model. Real economic expansion has a favourable effect on the financial sector, as may be inferred from the positive effects of increasing industrial production. Mishra and Pradhan (2009) looked into the relationship that existed between India's economic growth between 1980 and 2008 and the growth of the loan sector. The data shows that the nation's credit sector has prospered as a result of economic growth.

These are a handful of the examined studies that demonstrate a sustained relationship between financial development and economic expansion.

3. Objectives and Hypothesis

The study's objectives are listed below:

1. To investigate how factors related to the banking industry affect India's economic expansion.

2. To estimate the Bounds Test in order to determine whether there is a long-term correlation between economic growth and the banking industry in India.

The following hypotheses are thought to be tested in this investigation:

H_0: Factors associated with the banking industry have no appreciable influence on India's economic expansion.

H_1: The India's economic growth is significantly influenced by factors relating to the banking sector.

H_0: The banking industry in India does not exhibit a long-term correlation with economic growth.

H_1: The banking industry in India has a historical correlation with economic growth.

4. Data, Variables and Methodology

The availability of the data and their appropriateness for my study placed limitations on the amount of information that could be obtained. This research uses secondary time series data, which were chosen with consideration for the study's goals in mind. Public Sector Banks are the sole subject of the current study. The World Development Indicators (statistics on foreign direct investment, gross fixed capital formation and gross domestic product) and EPWRF India Time Series (data on branches, credit accounts, and credit deposit ratio) were the sources of the annual time series data used in the analysis, which covered the years 1990 through 2022. All of the study's variables are given in natural logarithmic form. The pertinent statistical analytic instruments are utilized to examine the collected data and determine the effect of banking infrastructure development on economic growth in India. The data is analysed using the statistical programme E-views.

Table-1 below provides a summary analysis of the many variables taken into account in the proposed study.

Table-1: Analysis of Variables

S. No.	Variable Name and Use	Specification/Measurement	Expected algebraic sign with dependent variable
1.	Gross Domestic Product (GDP) Dependent variable	Economic growth of India	-
2.	Number of Bank branches (BRN) Independent variable	Number of public sector bank branches in India	Positive
3.	Credit Accounts (CRA) Independent variable	Total number of credit accounts in public sector banks	Positive
4.	Credit Amount per Account (CRAMTPA) Independent variable	A qualitative variable related with banking performance	Positive
5.	Credit Deposit Ratio (CDR) Independent variable	Ratio of assets and liabilities of the bank	Positive
6.	Foreign Direct Investment (FDI) Control variable	Inflow of FDI	Positive
7.	Gross Fixed Capital Formation (GCFN) Control variable	Aggregate of gross additions to fixed assets	Positive

The stages below have been taken into consideration with regard to the methodology:

4.1 Unit Root Test

The Unit Root tests determine if a time series is stationary. A time series is considered stationary if a change in time does not result in a change in the distribution's form. When the statistical properties of a time series, such as the mean, variance, autocorrelation, etc., do not vary over time, the series is said to be stationary. Thus, the Phillips Perron (PP) and Augmented Dickey Fuller (ADF) tests have been run to see if the data for the current research unit root is stationary. One of two methods—one with an intercept only and the other with an intercept and a trend—is used in this work to estimate the Unit Root tests. In this instance, the alternative hypothesis is that the series does not have a unit root, while the null hypothesis is that the series does. The series is stationary if the null hypothesis (H_0) is not accepted. If the ρ - Value > 0.05, the data are non-stationary and have a unit root, failing to support the null hypothesis.

4.2 Optimum Lag Length Selection

Co-integration necessitates a test of lag duration. A decision on the maximum lag length must be made before calculating the time series equation. Various methods have been employed to ascertain the optimal lag length, including the sequential modified LR test statistic, the final prediction error, the Akaike information criterion, the Schwarz information criterion, and the Hannan-Quinn information criterion.

4.3 ARDL Model

The current research uses the ARDL approach to estimate the co-integration of a series. ARDL is a co-integration technique that was developed by Pesaran et al. (2001). For any ARDL model, a time series is a function of its lagged values, current values, and lagged values of one or more explanatory factors. The results have been further strengthened by the use of two models to identify the critical banking infrastructure components that significantly affect India's economic growth. In this way, we can comprehend the changes in the parameters as variables are progressively introduced into or eliminated from the model.

In investigating the relationship between the variables, the functional form of the models are specified as below:

Model I - GDP= f (BRN, CRA, CDR, CRAMTPA)

Model II - GDP= f (BRN, CRA, CDR, CRAMTPA, FDIN, GCFN)

The models can be described as below:

Model I - $LNGDP_t = \alpha + \beta_1 LNBRN_{it} + \beta_2 LNCRA_{it} + \beta_3 LNCDR_{it} + \beta_4 LNCRAMTPA_{it} + \varepsilon_{it}$ (1)

Model II - $LNGDP_t = \alpha + \beta_1 LNBRN_{it} + \beta_2 LNCRA_{it} + \beta_3 LNCDR_{it} + \beta_4 LNCRAMTPA_{it} + \beta_5 LNFDIN_{it} + \beta_6 LNGCFN_{it} + \varepsilon_{it}$ (2)

In the form of ARDL model, the above equation can be expressed by following Pesaran and Shin (1999):

Model I - $\Delta LNGDP = \alpha_0 + \sum_{i=1}^{n1} \alpha_{1i} \Delta LNBRN_{t-i} + \sum_{i=1}^{n2} \alpha_{2i} \Delta LNCRA_{t-i} + \sum_{i=1}^{n3} \alpha_{3i} \Delta LNCDR_{t-i} + \sum_{i=1}^{n4} \alpha_{4i} \Delta LNCRAMTPA_{t-i} + \sum_{i=1}^{m1} \beta_{1i} LNGDP_{t-i} + \sum_{i=1}^{m2} \beta_{2i} LNBRN_{t-i} + \sum_{i=1}^{m3} \beta_{3i} LNCRA_{t-i} + \sum_{i=1}^{m4} \beta_{4i} LNCDR_{t-i} + \sum_{i=1}^{m5} \beta_{5i} LNCRAMTPA_{t-i} + \mu_t$

Model II - $\Delta LNGDP = \alpha_0 + \sum_{i=1}^{n1} \alpha_{1i} \Delta LNBRN_{t-i} + \sum_{i=1}^{n2} \alpha_{2i} \Delta LNCRA_{t-i} + \sum_{i=1}^{n3} \alpha_{3i} \Delta LNCDR_{t-i} + \sum_{i=1}^{n4} \alpha_{4i} \Delta LNCRAMTPA_{t-i} + \sum_{i=1}^{n5} \alpha_{5i} \Delta LNFDIN_{t-i} + \sum_{i=1}^{n6} \alpha_{6i} \Delta LNGCFN_{t-i} + \sum_{i=1}^{m1} \beta_{1i} LNGDP_{t-i} + \sum_{i=1}^{m2} \beta_{2i} LNBRN_{t-i} + \sum_{i=1}^{m3} \beta_{3i} LNCRA_{t-i} + \sum_{i=1}^{m4} \beta_{4i} LNCDR_{t-i} + \sum_{i=1}^{m5} \beta_{5i} LNCRAMTPA_{t-i} + \sum_{i=1}^{m6} \beta_{6i} LNFDIN_{t-i} + \sum_{i=1}^{m7} \beta_{7i} LNGCFN_{t-i} + \mu_t$

To check the existence of long run relationship, the ARDL Model can be expressed in the long run form as shown below:

Model I - $LNGDP_t = \beta_0 + \sum_{i=1}^{m1} \beta_{1i} LNGDP_{t-i} + \sum_{i=1}^{m2} \beta_{2i} LNBRN_{t-i} + \sum_{i=1}^{m3} \beta_{3i} LNCRA_{t-i} + \sum_{i=1}^{m4} \beta_{4i} LNCDR_{t-i} + \sum_{i=1}^{m5} \beta_{5i} LNCRAMTPA_{t-i} + \mu'_t$

Model II – $LNGDP_t = \beta_0 + \sum_{i=1}^{m1} \beta_{1i} LNGDP_{t-i} + \sum_{i=1}^{m2} \beta_{2i} LNBRN_{t-i} + \sum_{i=1}^{m3} \beta_{3i} LNCRA_{t-i} + \sum_{i=1}^{m4} \beta_{4i} LNCDR_{t-i} + \sum_{i=1}^{m5} \beta_{5i} LNCRAMTPA_{t-i} + \sum_{i=1}^{m6} \beta_{6i} LNFDIN_{t-i} + \sum_{i=1}^{m7} \beta_{7i} LNGCFN_{t-i} + \mu'_t$

In case of the short run impact of independent variables on economic growth, the short run form of ARDL Model can be shown as below:

Model I - $\Delta LNGDP = \alpha_0 + \sum_{i=1}^{n1} \alpha_{1i} \Delta LNGDP_{t-i} + \sum_{i=1}^{n2} \alpha_{2i} \Delta LNBRN_{t-i} + \sum_{i=1}^{n3} \alpha_{3i} \Delta LNCRA_{t-i} + \sum_{i=1}^{n4} \alpha_{4i} \Delta LNCDR_{t-i} + \sum_{i=1}^{n5} \alpha_{5i} \Delta LNCRAMTPA_{t-i} + \gamma ECM_{t-1} + e'_t$

Model II - $\Delta LNGDP = \alpha_0 + \sum_{i=1}^{n1} \alpha_{1i} \Delta LNGDP_{t-i} + \sum_{i=1}^{n2} \alpha_{2i} \Delta LNBRN_{t-i} + \sum_{i=1}^{n3} \alpha_{3i} \Delta LNCRA_{t-i} + \sum_{i=1}^{n4} \alpha_{4i} \Delta LNCDR_{t-i} + \sum_{i=1}^{n5} \alpha_{5i} \Delta LNCRAMTPA_{t-i} + \sum_{i=1}^{n5} \alpha_{5i} \Delta LNFDIN_{t-i} + \sum_{i=1}^{n6} \alpha_{6i} \Delta LNGCFN_{t-i} + \gamma ECM_{t-1} + e'_t$

4.4 Diagnostic Statistics

Testing has been done on the proposed data to verify the efficacy and coherence of the model using residual diagnostics (Normality test, Serial Correlation LM test, and Heteroscedasticity test), stability diagnostics (Ramsey RESET Test and Cumulative Sum of Recursive residuals CUSUM and Cumulative Sum of Squares of Recursive Residuals CUSUM sum of squares), and co-efficient diagnostics (Long Run form and Bounds Test and Error Correction form).

4.5 Robustness of Model

We estimate the Fully Modified OLS, Dynamic OLS and Canonical Cointegrating models since they are the ones that provide estimates by accounting for serial correlation and endogeneity.

5. Analysis of Results

First, a matrix describing the variables and their correlation is established. The outcomes are shown in Table 2 below:

The rate of dispersion of the series from the mean, or the centre, is first shown in Table 2. The table's conclusion that each parameter under investigation had a normal distribution is supported by the results of the Jarque Bera test, which were not statistically significant. In the Jarque-Bera test, the alternative hypothesis assumes that the distribution is non-normal, whereas the null hypothesis assumes that the distribution is normal. Since every test probability value for every variable is more than 0.05, we accept the null hypothesis. Across the board, the distributions of the variables GDP, CRA, and BRN are favourably skewed. Since the kurtosis for each variable is less than 3, all curves are Platykurtic.

Table-2: Descriptive Statistics

	GDP	BRN	CRA	CDR	CRAMTPA	FDIN	GCFN
Mean	7.47E+13	61163.39	58569947	65.3181	304676.0	1.16E+12	2.24E+13
Median	6.39E+13	49241.00	50593296	65.8000	212493.2	1.20E+12	2.17E+13
Maximum	1.60E+14	94142.00	1.06E+08	78.7000	654529.2	3.28E+12	4.63E+13
Minimum	2.51E+13	41874.00	34892565	53.4000	22605.31	2.51E+10	6.35E+12

Std. Dev.	4.24E+13	19191.13	21687832	9.1372	248202.1	9.88E+11	1.29E+13
Skewness	0.5726	0.6769	0.7466	0.0568	0.2511	0.3735	0.2218
Kurtosis	1.9905	1.7441	2.2095	1.3365	1.3469	1.7603	1.6022
CV	1.761	3.187	2.700	7.148	1.227	1.174	1.736
Jarque-Bera	3.2044	4.6889	3.9255	3.8224	4.1041	2.8806	2.9568
Probability	0.2014	0.0958	0.1404	0.1479	0.1284	0.2368	0.2279

Source: Author's calculation.

The pairwise correlation coefficients in Table 3 illustrate the strength of the association between some variables and others.

Table-3: Correlation Matrix

	LNGDP	LNBRN	LNCRA	LNCDR	LNCRAMTPA	LNFDIN	LNGCFN
LNGDP	1.000						
LNBRN	0.942	1.000					
LNCRA	0.881	0.941	1.000				
LNCDR	0.770	0.741	0.760	1.000			
LNCRAMTPA	0.974	0.880	0.785	0.809	1.000		
LNFDIN	0.922	0.793	0.691	0.746	0.960	1.000	
LNGCFN	0.987	0.899	0.833	0.818	0.991	0.944	1.000

Source: Author's Calculation

The computed regression model seem not to have any multi-collinearity problems. None of the pairwise correlation coefficients between independent variables is 1.

The Unit Root test was examined using the Augmented Dickey Fuller (1981) and Phillips & Perron (1988) tests, and Table 4 presents the findings. According to the findings, the independent variables are a combination of orders I (0) and I (1), but the dependent variable is integrated of order I (1).

Table-4: Results of Unit Root Test

Variable	**Augmented Dickey Fuller Test**				**Phillips Perron Test**			
	At Level		**At First Difference**		**At Level**		**At First Difference**	
	Intercept	**Trend & Intercept**	**Intercept**	**Trend & Intercept**	**Intercept**	**Trend & Intercept**	**Intercept**	**Trend & Intercept**
LNGDP	-0.11 (0.939)	-2.54 (0.305)	-5.51 (0.0001)*	-5.45 (0.0006)*	-0.09 (0.941)	-2.54 (0.305)	-5.70 (0.000)*	-5.79 (0.0002)*
LNFDIN	-2.20 (0.210)	-1.81 (0.672)	-5.33 (0.0001)*	-5.83 (0.0002)*	-4.43 (0.001)*	-1.26 (0.879)	-5.33 (0.0001)*	-8.14 (0.000)*
LNGCFN	-1.23 (0.645)	-0.67 (0.966)	-6.53 (0.000)*	-6.66 (0.000)*	-0.72 (0.826)	-1.39 (0.842)	-6.51 (0.000)*	-6.66 (0.000)*
LNBRN	1.96 (0.999)	-3.64 (0.044)*	-2.86 (0.064)	-3.61 (0.050)*	-0.48 (0.881)	-1.70 (0.726)	-1.81 (0.366)	-1.69 (0.73)
LNCRA	1.02	-4.07	-3.98	-4.79	0.52	-1.19	-4.17	-4.79

	(0.995)	(0.019)*	(0.004)*	(0.002)*	(0.985)	(0.894)	(0.002)*	(0.002)*
LNCDR	-1.14 (0.686)	-1.51 (0.80)	-4.65 (0.0008)*	-4.58 (0.005)*	-1.11 (0.698)	-1.36 (0.851)	-4.65 (0.001)*	-4.58 (0.005)*
LNCRAMTPA	-4.48 (0.001)*	0.865 (0.999)	-1.75 (0.396)	-5.06 (0.001)*	-2.27 (0.186)	1.21 (0.999)	-3.25 (0.026)*	-4.69 (0.003)*

Source: Author's calculation Note – The values in the parenthesis are the probability values

The stationary test demonstrated that the order of variable integration was either at level I (0) or after the first difference, I (1), confirming the lack of second-order integrated variables. Therefore, the conditions for utilizing the ARDL are satisfied.

Table-5: Optimum Lag Length Selection

Lag order selection criteria Model I

Lag	Log L	LR	FPE	AIC	SC	HQ
0	91.41	NA	2.61e-09	-5.57	-5.34	-5.49
1	359.05	431.69	4.25e-16	-21.22	-19.84*	-20.77*
2	388.95	38.57*	3.55e-16*	-21.54*	-19.00	-20.71

Source: Author's calculation

Lag order selection criteria Model II

Lag	Log L	LR	FPE	AIC	SC	HQ
0	141.32	NA	4.07E-13	-8.66	-8.34	-8.56
1	446.45	452.77	2.94E-20	-25.190	-22.60*	-24.34
2	516.13	71.92*	1.32E-20*	-26.52*	-21.66	-24.94*

Source: Author's calculation

*indicates the lag order selected by the criterion

LR: sequential modified LR test statistic,

FPE: Final prediction error,

AIC: Akaike information criterion,

SC: Schwarz information criterion,

HQ: Hannan-Quinn information criterion

The optimal lag length in this study for both the models was chosen to be two based on the many lag length selection criteria that were taken into consideration. Thus according to the majority criterion, two is the ideal lag length for both Model I and Model II.

The full ARDL Model, encompassing both the short- and long-term effects of independent factors on the dependent variable, is shown in Table 6.

Table-6: Estimates of ARDL Model

Variable	Model I (2, 2, 0, 0, 0)			Model II (2, 1, 0, 2, 0, 1, 0)		
	Coefficient	t-statistic	Probability	Coefficient	t-statistic	Probability
LNGDP(-1)	0.477	2.095	0.047	0.477	3.588	0.002
LNGDP(-2)	-0.385	-2.328	0.029	-0.357	-2.870	0.010
LNBRN	-0.972	-3.884	0.000	-0.515	-2.641	0.016
LNBRN(-1)	0.647	1.680	0.107	0.740	3.718	0.001
LNBRN(-2)	0.513	1.487	0.151	-	-	-
LNCRA	0.342	4.455	0.000	0.332	4.915	0.000
LNCDR	-0.212	-2.071	0.050	-0.229	-2.920	0.009
LNCDR(-1)	-	-	-	-0.112	-1.324	0.201
LNCDR(-2)	-	-	-	-0.112	-1.474	0.157
LNCRAMTPA	0.352	4.891	0.000	0.156	3.534	0.002
LNFDIN	-	-	-	-0.015	-1.570	0.133
LNFDIN(-1)	-	-	-	0.040	4.039	0.000
LNGCFN	-	-	-	0.283	5.365	0.000
C	17.307	4.733	0.000	10.217	5.406	0.000
R^2			0.999			0.999
Adjusted R^2			0.998			0.999
F statistic	2943.135		0.000	4986.507		0.000

Source: Author's calculation

Co-integration Test

The presence of the long run connection in the model can be ascertained once it has been established that none of the series are I (2) or above. ARDL co-integration is used to examine the long-term connection in variables. I have computed the Bounds Test to determine whether the variables are co-integrated or have long-term linkages. For both models, the anticipated results are shown in Table 7. The alternative hypothesis asserts that co-integration exists, in contrast to the null hypothesis, which claims that it does not.

Table 7: Results of ARDL Bounds Testing

Model	Test Name	Test Value	Significance level	I(0)	I(1)	Decision
I	F-Statistic k	5.675 4	10% 5% 2.5% 1%	2.45 2.86 3.25 3.74	3.52 4.01 4.49 5.06	Reject H_0 Co-integration exists
II	F-Statistic k	15.064 6	10% 5% 2.5% 1%	2.12 2.45 2.75 3.15	3.23 3.61 3.99 4.43	Reject H_0 Co-integration exists

Source: Author's calculation

The parameter k, as shown in Table 7, is simply equal to the total variables minus one, or 4 and 6 for the two models, respectively. The calculated F statistic (5.675 and 15.064) lies outside the upper bound I (1) values at all significant levels, indicating co-integration among the variables in both models, according to the results of the Bounds Test for co-integration. Consequently, there is compelling evidence of a long-term link between the factors, hence the null hypothesis is rejected.

Table-8: Estimates of ARDL Model: Long Run

Variable	Model I			Model II		
	Coefficient	t-Statistic	Probability	Coefficient	t-Statistic	Probability
LNBRN	0.207	2.406	0.025	0.255	5.281	0.000
LNCRA	0.377	5.814	0.000	0.378	7.116	0.000
LNCDR	-0.233	-1.994	0.058	-0.516	-5.134	0.000
LNCRAMTPA	0.388	26.980	0.000	0.177	4.417	0.000
LNFDIN	-	-	-	0.028	2.776	0.012
LNGCFN	-	-	-	0.322	4.978	0.000

Source: Author's calculation

As seen in Table 8, the variables BRN, CRA, and CRAMTPA in Model I have estimated long run coefficients of the selected ARDL model that are significant at the 5% level of significance and have the predicted signs. As for the variable CDR, Model I contends that it has no long-term relevance, whereas Model II contends that the connection between CDR and long-term significance is negatively skewed. At the 5% level of significance, all other Model II variables and the controls, FDIN and GCFN, are significant.

Table 9 displays the findings from the estimation of the error correction model (ECM), which examines short-run dynamics.

Table-9: – Estimates of ARDL Model: Short Run

Variable	Model I			Model II		
	Coefficient	t-Statistic	Probability	Coefficient	t-Statistic	Probability
C	17.307	5.807	0.000	12.020	11.916	0.000
D(LNGDP(-1))	0.385	2.697	0.013	0.357	3.824	0.001
D(LNBRN)	-0.972	-4.605	0.000	-0.515	-6.355	0.000
D(LNBRN(-1))	-0.513	-2.247	0.035	-	-	-
D(LNCDR)	-	-	-	-0.229	-4.211	0.000
D(LNCDR(-1))	-	-	-	0.112	2.471	0.023
D(LNFDIN)	-	-	-	-0.015	-2.387	0.028
CointEq(-1)*	**-0.907**	-5.790	0.000	**-0.880**	-11.857	0.000
R^2	**-**	-	0.995			0.871
Adjusted R^2	**-**	-	0.994			0.839
F statistic	9.848	-	0.000	27.231		0.000

Source: Author's calculation

The error correction term's co-integration in both models is negative, suggesting convergence to the long-run equilibrium. Additionally, the data demonstrates that CDA, CRAMTPA, and GCFN seem to have little to no short-term impact on economic development in both models. According to Model I, the number of branches—

whether from the previous year or the current one—has a major, although negative, impact on economic growth. However, the number of branches in the current year has a significant detrimental effect on Model II's economic growth. The variable CDR has no obvious effect in Model I, however in Model II, CDR has an effect on economic growth that can be felt in either the current year or the year before. Nonetheless, this year's CDR impact indicates a negative relationship with growth. Finally, but just as importantly, there is a significant negative correlation between growth and the variable FDIN in Model II.

Diagnostic and Stability Tests

The validity of the model estimation is shown by the diagnostic tests. Breusch-Godfrey Serial Correlation LM test, Breusch-Pagan-Godfrey Heteroskedasticity test, Jarque-Berra normality test, and CUSUM and CUSUMSQ plots for normalcy are among the analytical tests that were employed. The model's econometric properties have been obtained, and these tests show that it is sufficiently appropriate.

The Jarque-Bera test findings for histogram normality are displayed in Figures -1 and -2.

Figure-1: Histogram - Normality Test

Model I

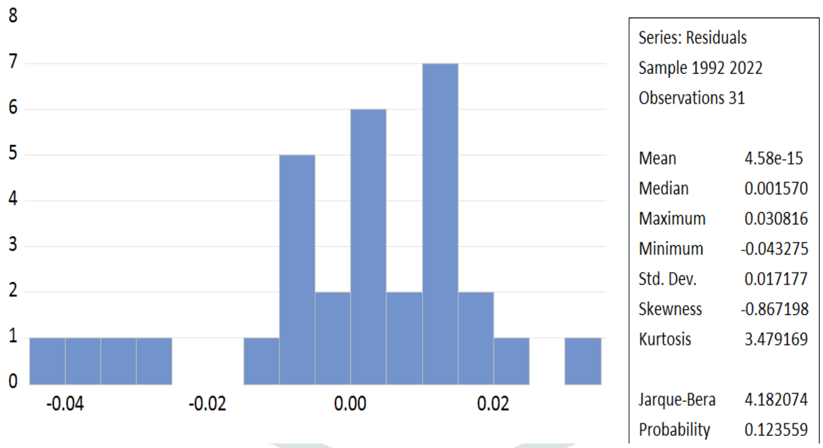
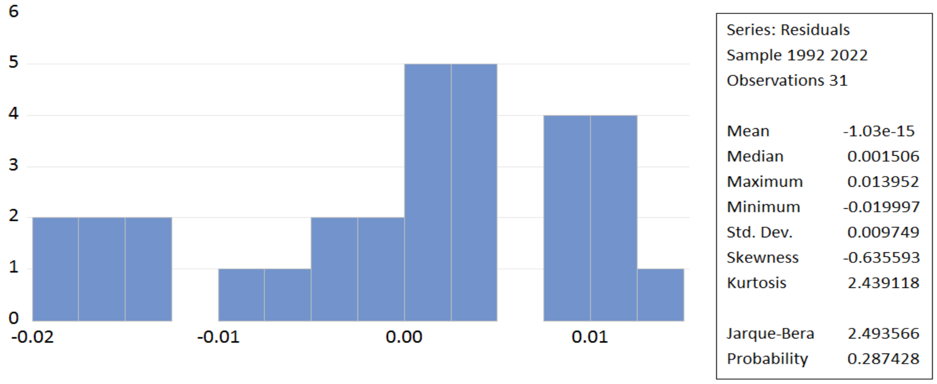


Figure-2: Histogram - Normality Test

Model II



Source: Author's Calculation

Since the ρ value in both models is larger than 5%, according to the data, the null hypothesis which claims that the residuals are normally distributed, cannot be rejected.

Table-11: Breush- Godfrey Serial Correlation LM Test

Model	Test Name	Test Value	Probability	Null hypothesis	Decision
I	Breush-Godfrey	F statistic = 0.097 $N*R^2$ = 0.299	0.907 0.860	No serial correlation at up to 2 lags	H_0 Accepted. No serial correlation present.
II	Breush-Godfrey	F statistic = 2.58 $N*R^2$ = 7.56	0.106 0.056	No serial correlation at up to 2 lags	H_0 Accepted. No serial correlation present.

Source: Author's Calculation

The results of Table-11 indicates that the values of F-statistic and $N*R^2$ are not statistically significant and thus the null hypothesis of no serial correlation is accepted.

Table-12: Heteroscedasticity Test

Model	Test Name	Test Value	Probability	Null hypothesis	Decision
I	Breush-Pagan-Godfrey	F-Statistic = 0.348 N*R Squared = 3.486	0.936 0.900	Homoscedasticity	H_0 Accepted. No Heteroscedasticity
II	Breush-Pagan-Godfrey	F-Statistic = 0.960 N*R Squared = 12.100	0.515 0.437	Homoscedasticity	H_0 Accepted. No Heteroscedasticity

Source: Author's Calculation

Table 12 shows that, based on the values of the F statistic and N*R2, there is no heteroscedasticity in any of the estimated models, thus the estimated models can be deemed suitable based on the results of this test.

Table-13: Ramsey RESET Test

Model	Test Name	Test Value	Probability	Null hypothesis	Decision
I	Ramsey RESET test	t – statistic = 1.94 F – statistic = 3.76	0.065 0.065	No specification error	H_0 Accepted
II	Ramsey RESET test	t – statistic = 0.216 F – statistic = 0.046	0.831 0.831	No specification error	H_0 Accepted

Source: Author's Calculation

It is evident from the applied tests of t-Statistic, F-Statistic, and Likelihood Ratio in both models that the values are determined to be statistically significant, indicating that the null hypothesis must be accepted and that the model's results do not contain specification errors.

The CUSUM and CUSUM of Squares Tests have been used to assess the models' stability. The findings are displayed in Figures 3, 4, 5, and 6. The stability of the examined model is demonstrated by the CUSUM and CUSUMSQ plots in the accompanying figures, which show that the designs are within a 95% confidence interval. The assessed model is therefore trustworthy for deriving unbiased statistical results and formulating plans.

Figure-3: Plot of Cumulative Sum of Recursive Residuals

Model I

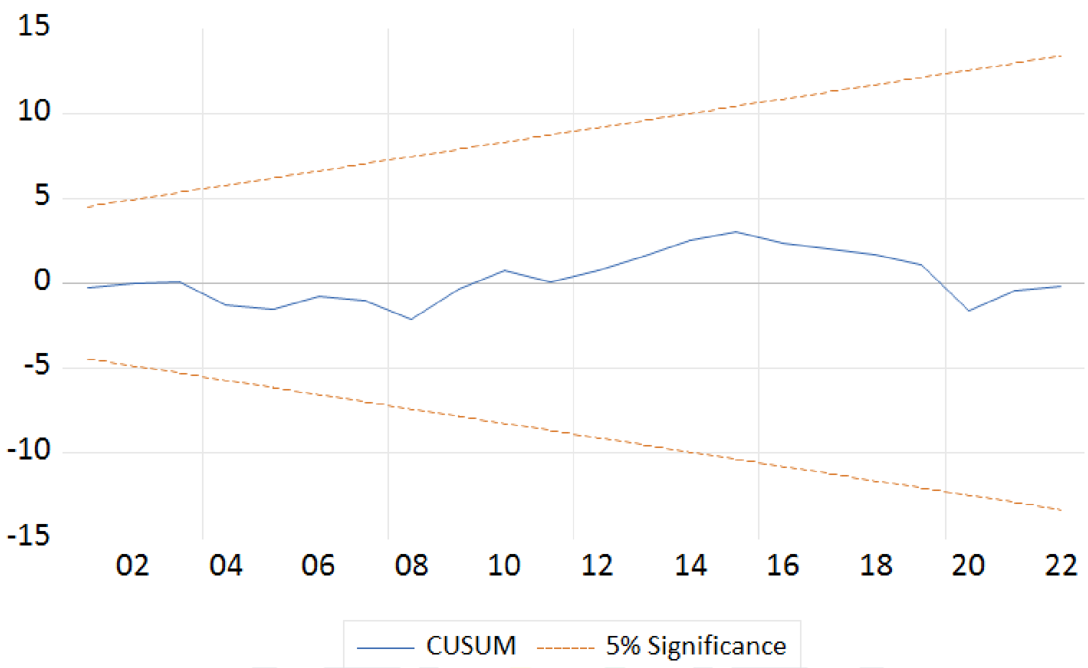


Figure -4: Plot of Cumulative Sum of Squares of Recursive Residuals

Model I

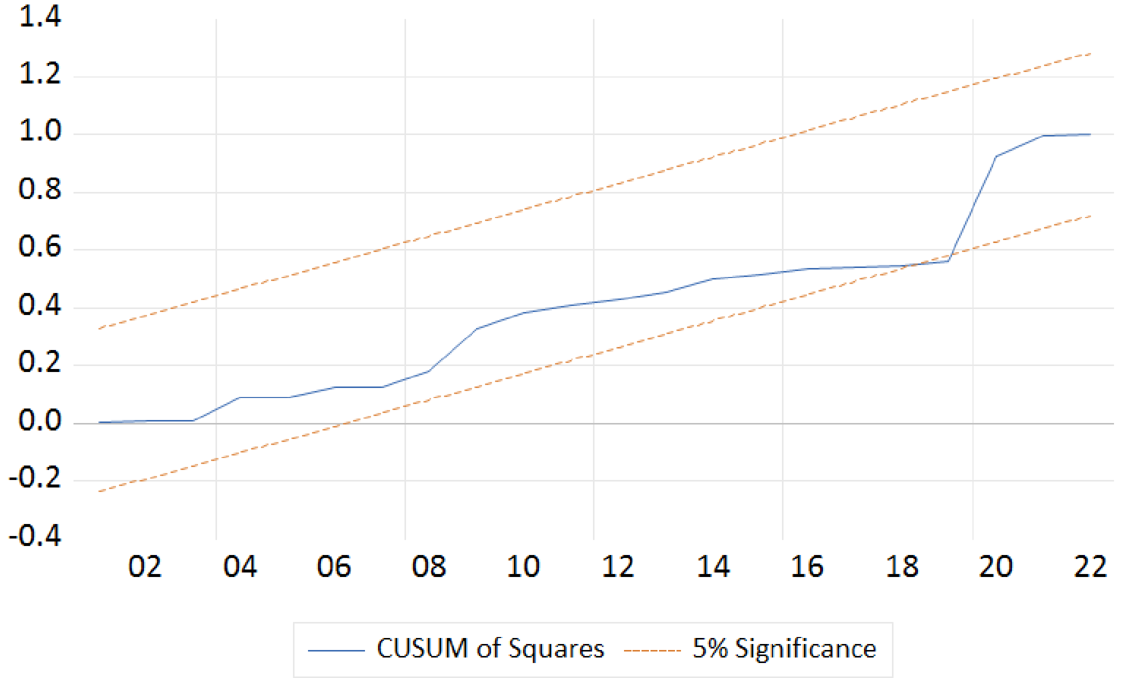


Figure-5: Plot of Cumulative Sum of Recursive Residuals

Model II

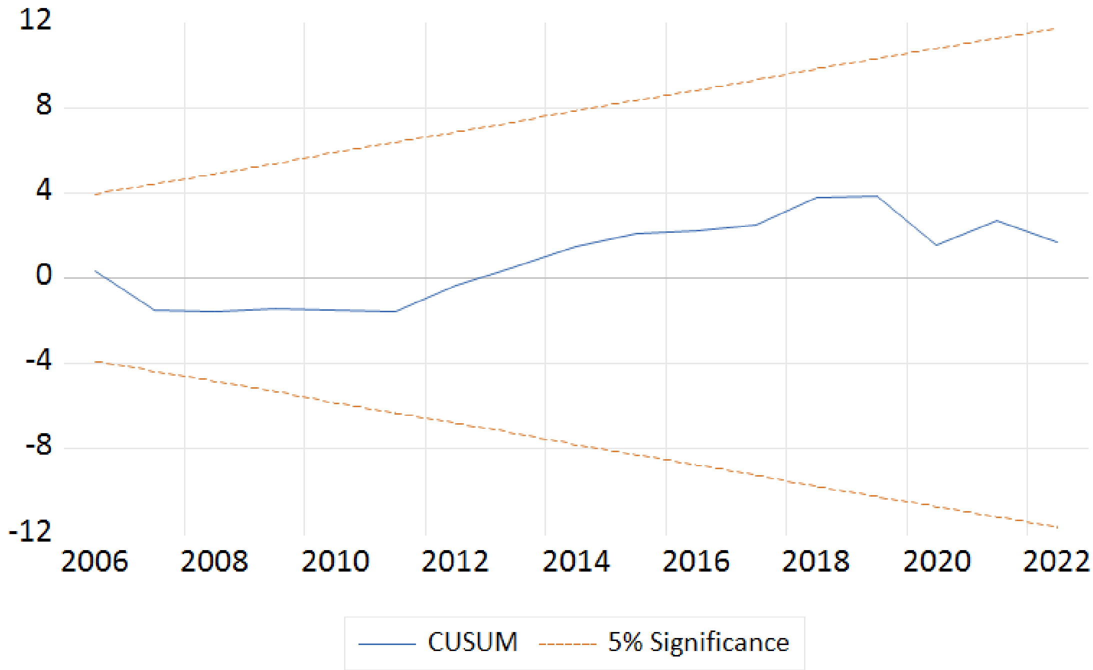
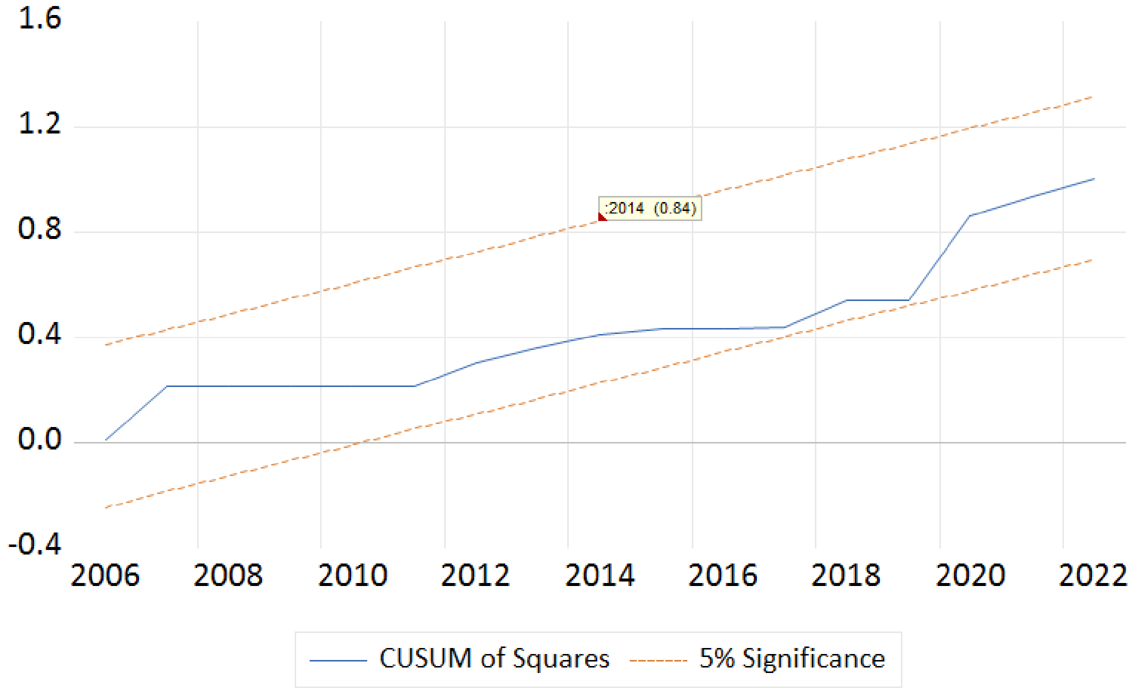


Figure-6: Plot of Cumulative Sum of Squares of Recursive Residuals

Model II



As can be seen, the plot in figure 3, which shows CUSUM for Model I, remains inside the critical 5% constraints (dotted lines). In contrast, the plot in figure 4, which shows CUSUMSQ for Model I, is just outside of the critical 5% bounds. An analogous plot that illustrates the CUSUM and CUSUMSQ for Model II in Figures 5 and 6 remains within the necessary 5% boundaries, so confirming the long-term link between the variables and demonstrating the stability of the coefficients.

Robustness of Models

For the two models, the FMOLS, DOLS, and CCR estimation results are displayed in Tables -13, -14, and 15. These are long-term models, and endogeneity and serial correlation problems have been taken into account while estimating the results.

Table 13 – Estimates of Fully Modified OLS Model

Variable	Model I			Model II		
	Coefficient	t-Statistic	Probability	Coefficient	t-Statistic	Probability
LNBRN	0.057	0.533	0.598	0.265	4.293	0.000
LNCRA	0.577	7.866	0.000	0.335	6.454	0.000
LNCDR	-0.776	-7.354	0.000	-0.649	-11.826	0.000
LNCRAMTPA	0.418	23.031	0.000	0.090	2.173	0.039
LNFDIN	-	-	-	0.031	3.197	0.003
LNFGCFN	-	-	-	0.511	7.525	0.000
C	19.028	36.069	0.000	9.062	4.860	0.000
R^2	0.995			0.998		
Adjusted R^2	0.994			0.997		

Source: Author's Calculation

The estimated results of FMOLS has been reported in Table 13. It is clear that according to FMOLS for Model I, BRN does not have significant long run impact on economic growth of India, however for Model II results show that BRN has a significant long run impact on economic growth along with the other control variables. In both the models CDR has a significant but negative impact on the economic growth of India.

Table 14 – Estimates of Dynamic OLS Model

Variable	Model 1			Model 2		
	Coefficient	t-Statistic	Probability	Coefficient	t-Statistic	Probability
LNBRN	0.933	5.084	0.000	0.003	0.017	0.986
LNCRA	0.042	0.408	0.689	0.342	3.763	0.013
LNCDR	0.067	0.342	0.737	-0.698	-2.992	0.030
LNCRAMTPA	0.297	10.645	0.000	-0.156	-1.501	0.193
LNFDIN	-	-	-	0.044	2.723	0.041
LNFGCFN	-	-	-	1.021	4.373	0.007
C	16.786	20.792	0.000	-3.626	-0.641	0.549
R^2	0.995			0.999		
Adjusted R^2	0.998			0.999		

Source: Author's Calculation

The estimated results of DOLS has been reported in Table 14. In Model I, CRA and CDR does not have a significant long run impact on the economic growth of India whereas in Model II the findings show that BRN and CRAMTPA does not have a significant and long run impact. However the results for Model II show that CDR has a significant but negative impact on the economic growth of India.

Table 15 – Estimates of Canonical Co-integrating Regression Model

Variable	Model 1			Model 2		
	Coefficient	t-Statistic	Probability	Coefficient	t-Statistic	Probability
LNBRN	0.076	0.579	0.566	0.280	4.210	0.000
LNCRA	0.562	5.519	0.000	0.329	5.750	0.000
LNCDR	-0.732	-4.742	0.000	-0.627	-8.386	0.000
LNCRAMTPA	0.413	19.972	0.000	0.093	2.112	0.044
LNFDIN	-	-	-	0.032	2.875	0.008
LNFGCFN	-	-	-	0.495	6.047	0.000
C	18.963	35.355	0.000	9.365	4.408	0.000
R^2	0.995			0.998		
Adjusted R^2	0.994			0.997		

Source: Author's Calculation

Table 15 presents the estimated outcomes of the CCR. It is important to note that while the CCR results are similar with the FMOLS findings, the DOLS findings do not match the FMOLS findings.

6. Findings and Implications

Using time series data from 1990 to 2022, the main objective of this study is to investigate the relationship between India's banking industry and economic growth. The optimum lag length requirement, the bounds test, the error correction mechanism, the ADF and PP Unit Root tests, and diagnostic statistics are all taken into consideration by the study as it employs the Autoregressive Distributed Lag approach to accomplish this purpose.

Furthermore, projections have been created for the FMOLS, DOLS, and CCR models. Only Public Sector Banks are included in the research due to data availability. GDP has been used as a stand-in for economic growth, with independent variables being the number of bank branches, credit accounts, credit deposit ratio, and credit amount per account. In contrast, the control variables in my analysis are FDI and GCFN.

Based on the study's findings, it can be concluded that the variables number of branches, credit deposit ratio, credit accounts, and credit amount per account, as well as the control variables FDI and GCFN, have a statistically significant long-term impact on India's economic growth. Model I asserts that the variable CDR is irrelevant in the long run, while Model II maintains that there is a negative skew in the relationship between CDR and long-term significance. FDI has a significant impact on the economic growth in the long run. However in short run, it has a significant but negative impact on the economic growth of India. In short run GDP have significant impact with one lag for both Model I and Model II. The same way BRN have a significant impact in the short run for Model II and with one lag in Model I. CDR has no impact for Model I whereas for Model II it has a significant impact with one lag also. Regarding the long run adjustment mechanism the rate of adjustment has been estimated as 90.7% for Model I and 88% for Model II both of which depicts that there will be long run equilibrium in the economy but with oscillations. The FMOLS and CCR models are nearly identical to those of the long run ARDL model.

More financial development as well as the robustness and effectiveness of the financial sector will be necessary to further boost India's growth potential. It is necessary to implement policies that support credit growth and to take steps to enhance bank lending in order to promote productivity.

References

Adam, M. H. M. (2022). Nexus among foreign direct investment, financial development, and sustainable economic growth: Empirical aspects from Sudan. *Quantitative Finance and Economics*, *6*(4), 640-657.

Alam, M. Q., & Alam, M. S. (2021). Financial development, economic growth, and poverty reduction in India. *Etikonomi: Jurnal Ekonomi*, *20*(1), 13-22.

Ali, K., Siddique, M., Chaudhry, M. A., & Tariq, H. (2022). Financial development and economic growth: An application of ARDL model on developed and developing countries. *Journal of Public Value and Administrative Insight*, *5*(1), 170-186.

Arestis, P., & Demetriades, P. (1997). Financial development and economic growth: assessing the evidence. *The economic journal*, *107*(442), 783-799.

Aziz, T., Khan, M. G. U., Islam, M. T., & Pradhan, M. A. H. (2022). An analysis on the relationship between ICT, financial development and economic growth: Evidence from Asian developing countries. *The Journal of International Trade & Economic Development*, 1-17.

Balasubramanian, R. (2022). Role of long-term bank credit in the economic growth of India. *Global Business Review*, 09721509211060218.

Bist, J. P., & Bista, N. B. (2018). Finance–growth nexus in Nepal: An application of the ARDL approach in the presence of structural breaks. *Vikalpa*, *43*(4), 236-249.

Calderón, C., & Liu, L. (2003). The direction of causality between financial development and economic growth. *Journal of development economics*, *72*(1), 321-334.

Chindengwike, J. (2022). The nexus between money supply and economic development in East Africa countries: An empirical study using ARDL. *Journal of Global Economy*, *18*(4), 237-250.

Danlami, M. R., Loganathan, N., Streimikiene, D., Mardani, A., & Hassan, A. A. G. (2018). The effects of financial development-trade openness nexus on nigeria's dynamic economic growth. *Economics & Sociology*, *11*(4), 128.

De Gregorio, J., & Guidotti, P. E. (1995). Financial development and economic growth. *World development*, *23*(3), 433-448.

Dixit, R., & Ghosh, M. (2013). Financial inclusion for inclusive growth of India-A study of Indian states. *International Journal of Business Management & Research*, *3*(1), 147-156.

Ellahi, N., & Khan, M. A. (2011). Testing finance growth nexus: an auto regressive distributed lag (ARDL) methodology approach for selected SAARC countries. *South Asian Journal of Management*, *18*(2), 76-91.

Ghildiyal, V., Pokhriyal, A. K., & Mohan, A. (2015). Impact of financial deepening on economic growth in Indian perspective: ARDL bound testing approach to cointegration. *Asian Development Policy Review*, *3*(3), 49-60.

Greenwood, J., & Jovanovic, B. (1990). Financial development, growth, and the distribution of income. *Journal of political Economy*, *98*(5, Part 1), 1076-1107.

Gupta, S. K., & Verma, S. (2012). Financial sector reforms in India and its impact. *International Journal of Research in Finance and Marketing*, *2*(7), 49-63.

Khan, N., Zafar, M., Okunlola, A. F., Zoltan, Z., & Robert, M. (2022). Effects of financial inclusion on economic growth, poverty, sustainability, and financial efficiency: Evidence from the G20 countries. *Sustainability*, *14*(19), 12688.

KUMAR, K., & PARAMANIK, R. N. (2020). Nexus between Indian economic growth and financial development: A non-linear ARDL approach. *The Journal of Asian Finance, Economics and Business (JAFEB)*, *7*(6), 109-116.

Kyophilavong, P., Uddin, G. S., & Shahbaz, M. (2016). The nexus between financial development and economic growth in Lao PDR. *Global Business Review*, *17*(2), 303-317.

Laeven, L., Levine, R., & Michalopoulos, S. (2015). Financial innovation and endogenous growth. *Journal of Financial Intermediation*, *24*(1), 1-24.

Lenka, S. K. (2015). Does financial development influence economic growth in India?. *Theoretical & Applied Economics*, *22*(4).

Lenka, S. K., & Sharma, R. (2017). Does financial inclusion spur economic growth in India?. *The Journal of Developing Areas*, *51*(3), 215-228.

Marafa, A. A. (2022). Impact of Financial Deepening on Economic Growth in Nigeria: Autoregressive Distributed Lagged (ARDL) Approach. *POLAC International Journal of Economics and Management Science (PILEMS), 8 (1)*, 281-291.

Mishra, P. K., & Pradhan, B. B. Financial Development and Economic Growth in India: An Empirical Analysis. *Editorial Board*, 97.

Mishra, P. K., Das, K. B., & Pradhan, B. B. (2009). Credit market development and economic growth in India. *Middle Eastern Finance and Economics*, *5*(3), 92-106.

Mohan, R. (2008). Economic Growth, Financial Deepening and Financial Inclusion* Rakesh Mohan. *Dynamics of Indian Banking: Views and Vistas*, 92-120.

Mohanty, R. K., & Bhanumurthy, N. R. (2019). Analyzing the dynamic relationships between physical infrastructure, financial development and economic growth in India. *Asian Economic Journal*, *33*(4), 381-403.

Nazir, M. R., Tan, Y., & Nazir, M. I. (2021). Financial innovation and economic growth: Empirical evidence from China, India and Pakistan. *International Journal of Finance & Economics*, *26*(4), 6036-6059.

Palamalai, S., Khanna, S., Agrawal, N., & Maity, B. (2022). Linkages between stock market development, banks and economic growth in India: An ARDL approach. *Indian Journal of Economics and Development*, *18*(4), 763-776.

Patrick, H. T. (1966). Financial development and economic growth in underdeveloped countries. *Economic development and Cultural change*, *14*(2), 174-189.

Paudel, R. C. (2020). The role of financial development in economic growth of Nepal: ARDL approach of cointegration with structural break analysis. *Journal of Economics and Business*, *3*(4).

Pradhan, K., & Kumar, V. (2022). An empirical analysis of impact of banking sector on Indian stock market. *Journal of Economic and Administrative Sciences*.

Pradhan, R. P. (2013). The Determinants of Long Run Finance Development: The ARDL Bound Testing Approach. *Prajnan*, *42*(1).

Pradhan, R. P., Arvin, M. B., & Norman, N. R. (2015). A quantitative assessment of the trade openness–economic growth nexus in India. *International Journal of Commerce and Management*, *25*(3), 267-293.

Pradhan, R. P., Arvin, M. B., Hall, J. H., & Bahmani, S. (2014). Causal nexus between economic growth, banking sector development, stock market development, and other macroeconomic variables: The case of ASEAN countries. *Review of Financial Economics*, *23*(4), 155-173.

Pradhan, R. P., Arvin, M. B., Hall, J. H., & Norman, N. R. (2017). ASEAN economic growth, trade openness and banking-sector depth: The nexus. *EconomiA*, *18*(3), 359-379.

Pradhan, R. P., de São Pedro Filho, F., & Hall, J. H. (2014). The impact of stock market development and inflation on economic growth in India: evidence using the ARDL bounds testing and VECM approaches. *International Journal of Economics and Business Research*, *8*(2), 143-160.

Pradhan, R. P., Zaki, D. B., Maradana, R., Dash, S. A. U. R. A. V., & Jayakumar, M. (2018). Development of banking sector and per-capita economic growth: The G-20 experience. *Finance India*, *32*(4), 1265-1286.

Qamruzzaman, M., & Jianguo, W. (2018). Nexus between financial innovation and economic growth in South Asia: evidence from ARDL and nonlinear ARDL approaches. *Financial innovation*, *4*(1), 20.

Qamruzzaman, M., Jianguo, W., Jahan, S., & Yingjun, Z. (2021). Financial innovation, human capital development, and economic growth of selected South Asian countries: An application of ARDL approach. *International Journal of Finance & Economics*, *26*(3), 4032-4053.

Qayyum, M., Yu, Y., Nizamani, M. M., Raza, S., Ali, M., & Li, S. (2023). Financial instability and CO2 emissions in India: evidence from ARDL bound testing approach. *Energy & Environment*, *34*(4), 808-829.

Saad, W. (2014). Financial development and economic growth: Evidence from Lebanon. *International Journal of Economics and Finance*, *6*(8), 173-186.

Schipke, A., Turunen, J., Choueiri, N., & Gulde, A. M. (Eds.). (2023). *India's Financial System*. USA: International Monetary Fund.

Schumpeter, J. A. (1934). The theory of economic development (Harvard University Press, Cambridge, MA).

Sehrawat, M., & Giri, A. K. (2015). Financial development and economic growth: empirical evidence from India. *Studies in Economics and Finance*, *32*(3), 340-356.

Sehrawat, M., & Giri, A. K. (2018). The impact of financial development, economic growth, income inequality on poverty: evidence from India. *Empirical Economics*, *55*, 1585-1602.

Selvasundaram, K., Sagathevan, S., & Abdu, M. (2022). Financial development and economic growth in BRICS revisited: An application of cross-sectional augmented ARDL. *International Social Science Journal*, *72*(245), 799-812.

Sethi, D., & Sethy, S. K. (2018). Financial inclusion matters for economic growth in India: Some evidence from cointegration analysis. *International Journal of Social Economics*, *46*(1), 132-151.

Shahani, R., Sharma, S., & Akriti, G. (2018). Financial Development & Economic Growth Nexus: Empirical Investigation of Three South Asian Economies. *Pacific Business Review International*, *11*(2), 69-78.

Sharma, D. (2016). Nexus between financial inclusion and economic growth: Evidence from the emerging Indian economy. *Journal of financial economic policy*, *8*(1), 13-36.

Smith, A. (1776). 1976. An Inquiry into the Nature and Causes of the Wealth of Nations. *RH Campbell and AS Skinner, Oxford: Oxford University Press. Adam Smith145*.

Tripathy, N. (2019). Does measure of financial development matter for economic growth in India. *Quant Financ Econ*, *3*, 508-525.

Uddin, G. S., Shahbaz, M., Arouri, M., & Teulon, F. (2014). Financial development and poverty reduction nexus: A cointegration and causality analysis in Bangladesh. *Economic modelling*, *36*, 405-412.

Wu, C. F., Huang, S. C., Chang, T., Chiou, C. C., & Hsueh, H. P. (2020). The nexus of financial development and economic growth across major Asian economies: Evidence from bootstrap ARDL testing and machine learning approach. *Journal of Computational and Applied Mathematics*, *372*, 112660.

Zafar, K. M. (2020). ARDL–Analysis of the Relationship among Exports, FDI, Current Account Deficit and Economic Growth in Pakistan. *Iranian Economic Review*, *24*(2), 393-414.