



A STUDY OF FINANCIAL DEVELOPMENT AND ECONOMIC GROWTH: AN EMPIRICAL EVIDENCE FROM AN INDIAN ECONOMY

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Abstract— Purpose: Using yearly information from 1982 to 2020, the paper's goal is to investigate the link between economic growth & financial development in India.

Design/methodology/approach: ADF, KPSS, Ng– Perron, and DF-GLS unit root tests are used to verify stationarity characteristics. The autoregressive distributed lag (ARDL) technique to co-integration is used to investigate short and long-run dynamics.

Findings: The co-integration test reveals a long-term link between India's economic growth and financial development. According to the findings of the ARDL tests, both market and bank-based indices of financial development have a significantly and positives influence on India's economic growth. As a result, the findings back up the supply-side hypothesis and emphasize the significance of financial development in economic growth. The results also suggest that the Indian financial sector, which is dominated by banks, has the ability to develop the economy through credit transmission.

Originality/value: To achieve long-term economic growth, the current study suggests suitable financial market changes. Policymakers that aim to maintain a simultaneous expansion of growth and financial development may find the findings valuable.

Keywords— India, Financial development, ARDL, Economic growth

I. INTRODUCTION

Financial markets become more accessible and profitable as the financial system expands in size, stability and effectiveness. In Gurley and Shaw (1955), the financial sector is essential to the survival of the real sector. There will be less work, less output, and less investment if you put money into a broken financial system. Long-term, this is bad for business because it slows down the economy (Shrestha, 2005). On the other hand, well-developed financial sectors contribute to the expansion of a country's economy. To alleviate poverty, large investments and financial sectors development necessitate that is, the establishment and growth of financial bodies, institutions, markets, and financial instruments. As a result,

the arrival of financial institutions helps to reduce the costs of obtaining data, implementing agreements, and conducting transactions. Additionally, a more dynamic economy is sparked by increased access to capital, which in turn promotes innovation and well-being. Capital allocation in a more favourable manner can be encouraged by financial sector growth that provides better data on potential profitable investments.

In order to improve capital allocation and reduce the cost of corporate governance, Stiglitz & Weiss (1983) and Diamond (1984) argue that a well-developed financial market reduces information costs (Bencivenga and Smith, 1993). Incentives for technological advancement are provided by well-established financial intermediaries (King and Levine, 1993b). That financial systems can be used to trade and hedge financial risks, as well as diversify portfolios and reduce overall exposure has been suggested by Levine (1997). Capital accumulation and technological advancement are intertwined with economic growth.

Working capital and fixed capital investments can both benefit from credit allocation outside the financial system; the former is used to boost manufacturing productivity, while the latter is used to boost real sector productivity. In the real world, it's nearly impossible to make it without a strong financial sector. According to some economists, the relationship between economic growth and financial progress is not as simple as previously stated. Financial development, according to Robinson (1952), "a supporter of this school of philosophy, financial development plays a minimal role in economic growth; it is somewhat triggered by growth. According to Wijnberg (1983) and Buffie (1986), financial expansion has led to borrowers moving from informal to formal sectors (1984). As a result, credit is becoming more scarce, which is hurting the country's growth. According to Lucas, financial markets have a negligible impact on economic growth (1988). There was even more confusion about the role of finance in economic growth in 1997, when the financial markets stopped directing massive inflows of cash into productive companies. To put it another way, subprime mortgage loans were the primary cause of financial markets collapsing in 2008. As a result of the countries' inability to monitor and regulate the



growth of financial markets and their lack of ability to keep up with financial innovation, the overall economy could be adversely affected.

As a result, various perspectives on the connection between financial and economic development have emerged. Some academics believe that the financial sector has a direct impact on economic growth, while others believe that the two are unrelated. Some believe that the expansion of the financial and economic sectors is a two-way street (Demetriades and Hussein, 1996; Greenwood and Smith, 1997). An examination of how financial development is measured suggests that these variables have a significant impact on how economic growth and financial development are linked. It appears that the results of these two areas change over time and across countries. Due to the prevalence of bivariate causality analysis in this field of study, prior research may be vulnerable to the omission of factors bias. Multivariate analysis and time-stamped data from India are used in the current study to re-examine the problem. Since 1991, when the government began implementing policies of globalisation and

liberalisation, the Indian economy has undergone enormous transformations. As interest rates began to fall, liquidity and reserve ratios began to decline. These alterations were put in place in order to improve economic efficiency.

Ahluwalia has meticulously documented these changes over the past few years (2002). Bank activity has seen notable progress since 1969, when the intermediation process was strengthened following the completion of the first stage of nationalisation. There will be more than 1,45,798 bank branches in existence by the year 2020, according to estimates. Over the course of this period, deposits and bank credit grew from 25.73 percent to 74.97% and 17.5% to 56.08% respectively. Banks appear to be in charge of the Indian financial sector, based on these patterns of growth. In addition, changes and developments in India's financial sector are clearly reflected in the growth and trends of financial development indicators. Table I shows the trends in the growth rates of various financial metrics. There has been a steady rise in private credit as a percentage of GDP since 1980, which is expected to reach a peak of 55.25% in 2020.

Table- 1 Financial development – selected indicators

Indicators	1980s	1990s	2000s	2010s	2020s
Market capitalization to GDP (%)	8.89	36.09	59.79	72.409	104
M3/GDP%	34.47	42.18	54.65	77.68	88.16
Private credit (% of GDP)	28.8	28.6	43.1	50.30	55.25
Total credit /GDP (%)	48.89	50.7	66.29	73.44	-
GDP per capita growth (%)	3.1	3.6	5.3	5.35	-8.23

Note: For private credit we used domestic private-sector credit as a surrogate.

Source: Handbook of Statistics on Indian Economy, Reserve Bank India and Author's calculations

It rises from 8.89 percent in 1980 to 104 in 2020, the percentage of stock market capitalization in GDP. It's also been noted that the percentage of stock market capitalization to GDP rose quickly in 2009 and 2010 as the global financial crisis worsened due to a strong rise in share prices from a very low price in 2008. Since its inception, M3's share of GDP has steadily increased from 34.47% to 88.16%. Moreover, Table I shows that the percentage of total credit to GDP was greater than the percentage of market capitalization to GDP, implying that the Indian financial system is oriented toward the banking sector.

II. LITERATURES REVIEWS

When it comes to financial development, there has been a lot of debate since the Industrial Revolution, when the role of finance and economic activities in society were closely linked. Therefore, the real-estate sector, according to Gurley and

Shaw in 1955, has a difficult time surviving in the absence of a financial sector. McKinnon and Shaw establish the role of financial development in economic growth (1973). On the other hand, Buffie (1984) presented conflicting views on the linkage between economic growth and financial development in the middle. This finding investigates the role of the informal financial market in influencing the real economy. This means that as the financial sector expands, it becomes more difficult to obtain liquidity, which has a negative impact on financial markets. As a result, there is a lack of credit, which stifles property development. Research on the role of financial development in economic growth in various contexts and country cases has been extensively conducted. There have been a number of recent studies that focus on how the industry has been prioritised in the literature.

According to Patrick (1966), supply-leading and demand-following phenomena often interact. Before, most research



focused on a two-variable example, which may have skewed the results because it excluded important factors. In more recent empirical studies, this flaw has been addressed. For example, Luintel and Khan (1999), for example, use multivariate VAR models to evaluate the long-run link between financial development and economic growth for ten countries. They find that long-run financial development and output correlations exist for all sample countries, as well as bidirectional causation between financial development and economic growth. On the other hand, Patrick (1966) noted that financial assistance is often dependent on the development of real results in the agricultural and other economic sectors. According to him, the national financial market is flourishing as a result of the country's real economic expansion. Again, he came to the conclusion that financial development could have three major effects on inflation and economic growth in real money. Better financial markets encourage more efficient resource use in the first place. First and foremost, a well-organized financial market that encourages families to save, invest, and be more productive is essential to efficient financial institutions. A strong financial market is essential for increasing productivity and stimulating economic growth, which is why a country's financial development should include a mix of both external and internal savings and investment. Patrick has discovered a connection between economic growth and the development of financial resources from two different angles. For the supply and follow-up needs, he provided the best hypotheses. In an attempt to put an end to the debate, Goldsmith (1969) argued that financial development had advanced significantly ahead of the time when economic growth and revenue were at an all-time low. De Gregorio and Guidotti also lent their support to his findings (1995). Using data from 56 countries, Jung (1986) demonstrated that the supply-leading hypothesis applies to LDCs while the demand-following hypothesis applies to developed economies. It is common for economists to overlook the importance of financial systems in economic growth, according to Lucas (1988).

As Jeremy Greenwood and Boyan Jovanovic put it, "Financial institutions distribute resources to grow" (1990). Increase economic growth through the most efficient use of a large pool of money set aside for long-term investments. The level of financial intermediation and economic expansion is determined by the Pareto optimization technique, according to research. Both of these are internal. By expanding the economy, financial intermediation helps to maintain the environment for large-value finance, thereby promoting economic growth. An increase in economic and financial growth is a direct result of these two factors working in tandem. Financial stability is critical to reducing risk and increasing productivity, according to Bencivenga and Smith (1991). Spears (1992) shows that financial development leads to economic growth in ten Sub-Saharan African countries. "Ahmed and Ansari (1998) investigate the link between economic growth and financial development in Sri Lanka,

India, and Pakistan. According to the results of causality analysis, these countries' economic growth is driven by financial development. Taken together, these findings show that, at least for LDCs, the supply-leading concept is correct.

Liquid liabilities are used as a measure of financial depth by King and Levine (1993), who also examine the relationship between economic growth and financial development by averaging three growth indicators over the sample period: total productivity growth, real per capita capital stock growth, and real per capita GDP growth. Using data from 77 countries between 1960 and 1989, King and Levine find a positive and statistically significant link between financial depth and the three growth metrics. Increased investment potential, lower transaction costs, and increased home conservation are all factors that Pagano (1993) claims can contribute to economic growth through financial sector development.

According to De Gregorio and Guidotti (1995), financial development leads to increased growth performance. Granger causality tests conducted by Wachtel and Rousseau (1995) revealed that financial development is an important driver of economic growth in the United States, the United Kingdom, and Canada. When Galetovic (1996) looked at the relationship between financial development and economic growth, he found none. De Gregorio, Guidotti, and Others (1995). Economic growth was strongly linked in the early stages of development to financial development, according to the researchers. A decrease in the impact of financial development can be seen as income levels rise in the OECD countries studied. Economics and financial development were examined by Arestis and Demetriades (1995) in their paper on the subject. According to their findings, financial development has outpaced economic expansion in countries studied by using cross-country regression and a time-series approach to estimate macro variables. Time series data from a single country is more reliable in terms of technique than cross-country regression. Banks are critical to the growth of the economy. In a capital-based financial system, capital markets are well developed and banks play only a minor role in the fund's asset allocation. It's a bank-based financial system that promotes long-term, productive investment and reduces speculative activity. Because of this, bank-based financial systems promote stability in the economy and help implement economic policy. If you have a bank-based financial system, speculative financing has no effect on real economic activity, unlike a capital market system, where it does have an impact. If monetary and industrial policies are to be implemented in tandem, a bank-based financial system may be a useful tool (Arestis and Demetriades, 1996). The impact of financial repression and financial liberalisation on the growth of emerging economies cannot be overstated. The term "financial liberalisation" refers to interest rates set by the market, which appeal to the surplus units. Financial institutions are growing and investment is rising as a result. A reduction in the use of "directed credit facilities" improves the quality of investment. Market-determined rates of return can be increased by



investment initiatives. In a liberalised financial system, economic growth and financial development are linked positively, with the causality going from financial development to economic growth. As a result, the government maintains low real interest rates, which is a sign of a financially depressed economy. Due to government guidelines (directed concessionary lending rates and credit programmes), the investment quality is harmed by the limited supply of loanable money. Economic growth is suffering as a result of a decrease in investment volume and quality. Nevertheless, it is possible to demonstrate a link between increased financial security and increased economic growth. Contrary to popular belief, the expansion of credit in a more liberalised financial system may not be as beneficial to the growth of the economy. Financial progress and economic growth are therefore more closely linked in free economies than in repressive ones, according to this finding (Arestis and Demetriades, 1996).

On the basis of data from 22 Asian, Latin American, and Caribbean emerging states Thornton (1996) believes that financial development has little impact on economic growth. Because of the wide range of variables, time periods, countries studied, and statistical approaches, it is to be expected that the research's empirical findings are somewhat contradictory.. Short-term dynamics of economic growth and financial development are the focus of this study's statistical methods, which exclude long-term equilibrium states from their analysis. Time-series methods, such as the vector error-correction mechanism (VECM) and cointegration tests, have also been used to test the supply-leading vs demand-following hypothesis in a variety of studies. Murinde and Eng (1994), for example, investigate the relationship between Singapore's economic growth and financial development. A new econometric approach is used to investigate Granger causality, stationarity, and cointegration. They have developed a supply-leading concept in Singapore through their research. Demetriades and Hussein (1996) used Granger causality and cointegration approaches to examine the causal links between economic growth and financial development for 16 countries. That a country's economic growth is dependent on a strong financial sector was found to be unsupported by the evidence. Bidirectional causality and reverse causality have been found to exist. According to Levine (1997), long-term economic growth and the financial system are inextricably linked. It can be used on all levels, from the smallest to the largest. For industrialization to be a success, long-term capital investment is necessary. Investors are enticed to hold these assets, and the money is directed to the most efficient entrepreneur, thanks to an active financial market. There was a shift in the availability of liquid resources that sparked the industrial revolution. It is argued that the growth of money and the development of new technologies aids economic growth by facilitating financial development. Singh's 1997 research. According to him, the stock market often distributes resources in the wrong way due to the volatility of the pricing process on the stock market in developing countries. As a result of his discovery of the rapid

growth of the stock market, this could lead to an economic crisis in developing countries.

It has been found that stock market activity and the level of banking development and growth in the capital stock, average output and productivity all have a statistically significant correlation with stock market activity (Levine and Zervos 1998). Concurrent regressions, in which the independent and dependent variables are correlated over the same time period, are also used for the same reasons. As a gauge of banking growth, bank loans to the private sector are used. A number of metrics, such as value traded and turnover ratio, are used to gauge the equity market's capitalization and liquidity. Indicators of stock market liquidity, but not stock market volume, have been shown to be reliable indicators of future economic development. The results of stock market size regression are influenced by a number of countries. Luintel and Khan (1999) analysed data from ten less developed countries and found that financial development had a different relationship to economic growth. Multivariate Granger causality tests within an error correction framework are used by Darrat (1999) to examine the role of financial development in economic growth in Saudi Arabia, Turkey and the United Arab Emirates and his findings generally support the view that financial development is a necessary causal factor of economic growth. According to Ghali, his research focuses on the connection between financial development and growth in Tunisia's emerging economy (1999). Study results show a long-term stable link between financial development and changes in per capita real production in the United States, which may serve as a growth engine for the country. Cheng (1999) used Hsiao's version of the Granger causality and cointegration approach to demonstrate the link between financial development and economic growth in postwar Taiwan and South Korea. The advancement of technology and information, as well as changes in legal and political provisions and regulations, all contribute to the evolution of the financial system. Previous studies had to be reviewed and interpreted by the author.

GMM panel estimators were used by Levine, Loayza, and Beck (2000) to study economic growth and financial development. The researchers also use cross-country instrumental variables regression. For the panel's estimation, a total of 74 countries were averaged over seven- to five-year periods between 1960 and 1995. Regression analysis uses legal origin as an indicator of national policy on financial sector efficiency, assuming that this has an impact. In other words, Levine et al. claim that the positive correlation between economic growth and the development of financial intermediaries isn't the result of simultaneity, reverse causation, or the omission of parameters. A growing body of evidence shows that financial development is essential for growth regardless of the data set or econometric methodology used. Shan et al. (2001) drew attention to the economic performance of other Asian countries (such as China) that have achieved significant economic growth despite having a



financial system that is both oppressive and weak. A study by Cargill and Parker (2001) drew on Japan's economic history to provide context for their findings. Using data from those countries, some academics looked into the economic and financial development of specific countries. Financial development, according to Arestis et al., is a multidimensional process (2001). Economic growth and financial development are not intertwined, they claim. They are incorrect. There are both advantages and disadvantages to over-liberalizing the financial system. Using a threshold regression model, Deidda and Fatouh (2002) discovered an indirect link between financial development and economic growth.

International relations between leading economic growth finance cannot be done in all countries, says Al-Yousif (2002). Chen (2002) conducted a Bayesian vector analysis test and a co-integration test using Chinese economic data from 1952 to 1999. There were three main areas of focus in this investigation: personal finances and national income. In his view, long-term economic growth necessitates interest rate liberalisation and robust financial intermediation. According to Ansari (2002a), who examined the link between national income and money supply, the expansion of Malaysia's financial markets aided the country's economic growth.

Turkey's economic growth and financial development can be linked in one direction or the other based on data from 1970 to 2001, according to Ünalms (2002). There are non-causality tests being used here. In the short term, financial development appears to be a cause of economic growth, but in the long run, economic growth and financial development are linked. In 19 OECD countries, Schich and Pelgrin (2002) found a strong connection between higher investment levels and financial development. Müslümov and Aras (2002) conducted Granger causality assessments using panel data in 22 OECD countries and found one-way relationships ranging from financial market development to economic growth. According to Bernanke and Gertler in 1989, Becker and Thorbjrn Knudsen in 2002, and Rousseau in 2002, Joseph Schumpeter established this link between economic growth and financial development. Financial progress has a significant impact on the growth of the economy, as he demonstrated. Prior to now, the importance of finance had gone unnoticed. Financial intermediation is a critical part of the process of development.

' As a result, not only is the cost of obtaining information reduced, but so are the risks and the time involved. Entrepreneurship necessitates the development of a new method or technology that is superior to what has gone before. It's the path forward, or at least the path toward improvement. For 109 developed and developing countries, Calderon and Lin (2003) used the Geweke decomposition test to investigate the direction of causation between 1960 and 1994. There was a two-way causal relationship discovered. As a result, the correlation between financial institutions and GDP is stronger in emerging economies than in developed economies. The new data and panel econometric methods used to re-examine the relationship between equity markets, banking sectors and

economic growth. After correcting for omitted variables and simultaneity bias, bank development and stock market indicators are examined to see if they are linked to economic growth. Using data averaged over five years, GMM estimators were used to analyse a panel of 40 countries from 1976 to 1998. Panel estimates show that banks and stock markets have a mutual influence on economic growth, which implies that banks offer distinct financial services from stock markets. Christopoulos and Tsionas (2004) investigate the long-term relationship between fiscal depth and economic growth using a panel unit root and ten developing countries. A balance between financial depth and growth has been shown to exist, and this is supported by empirical evidence. Harb and Mouawiya (2005) use cointegration methods like Johansen's cointegration, Granger causality, and variance decompositions to investigate the connection between financial development and economic growth in the Middle East. Ultimately, economic growth and financial development may be intertwined, according to the study findings. Short-term changes in financial development can be attributed to real economic growth, according to panel causality tests, but individual country tests fail to provide conclusive proof.

If financial development in Asia-Pacific Economic Cooperation (APEC) countries between 1981 and 2000 helps economic growth, Tang (2006) uses a modified growth model to investigate. The stock market, the banking industry, and the movement of capital are three of the most important elements of financial development that influence economic growth. Only stock market expansion appears to have a significant growth-enhancing effect among developed countries, according to the findings. Even after accounting for the simultaneity bias, a strong positive correlation remains. As a result, there is no conclusive evidence that the development of financial infrastructure affects the overall link between finance and growth.

According to Ang and McKibbin, Malesia used time series data from 1960 to 2001. (2007). A co-integration approach and a unit root test were used in the study. Economics and financial development are intertwined, according to the findings of the study It turned out that the theory of supply following demand was right on. As the economy grew, so did the amount of money people had to spend. The financial sector grew and deepened as a result of the growth of the economy. According to Ang and Warwick (2007), who argue that economic growth is unidirectionally linked to financial sector development, Malaysia's financial sector development is positively affected by financial liberalisation.

Zang and Kim (2007) applied panel analysis to 74 countries to show that economic growth leads to financial development. In the third camp, growth and finance are inextricably bound together. An analysis of the relationship between finance and growth in 10 less developed countries using multivariate vector auto regression analysis found the feedback effect. There is a correlation between economic growth and financial development, according to the data. It is assumed that



economic growth and financial development are not intertwined in this perspective. As Lucas points out, the role of finance in explaining economic growth was greatly exaggerated (1988). The impact of financial development on economic growth has been studied. Numerous approaches have been used to investigate this link. Cross-country regressions, panel data, and time-series analysis were all used in some of the studies. Using the Granger causality test developed by Gryay and his colleagues, Northern Cyprus' economic growth and financial development are examined (2007). Despite the fact that the development of financial intermediaries does not lead to an increase in economic growth, there is evidence to suggest that this is the causal direction.

Ozturk (2008) uses a vector autoregression (VAR) methodology based on the theory of cointegration and error-correction representation of cointegrated variables to investigate causality in Turkey's economic and financial development from 1975 to 2004. Researchers have found a long-term relationship between financial development and economic growth. There may be an impact on whether or not financial deepening can boost economic growth on government policies and the financial systems based on capital markets and banks. The term "bank-based financial systems" describes financial systems in which banks play an important role. In a banking-based financial system, banks and businesses are inseparably linked. A bank-based financial system has a wide range of characteristics.

Adamopoulos (2008) examined the relationship between the growth of Ireland's credit market and the stock market between 1965 and 2007. The growth of the stock market and the expansion of the economy are intertwined, according to Granger's causality analysis.

Additional loans would be available to stimulate the economy if people saved more, according to McKinnon (1973), who proposed an effective financial system. From 1971 to 2007, Odhiambo (2008) examined the relationship between stock market growth and South African economic growth using data from ARDL bond assessments. There is a direct correlation between economic growth and the development of the stock market, according to studies. Singh (2008) conducted a time-series study of the Indian economy using data from 1951 to 1996. The results showed that India's economic development had a one-way causal relationship. One-way causality was found by Yang and Yi (2008) when they investigated the relationship between Korea's economic growth and its financial development. A study by Perera and Paudel (2009) used time-series data on Sri Lanka's economy and financial development from 1955 to 2005. Financial development indicators are used to conduct the analysis. The co-integration and unit root econometric methods were employed. The Granger causality test was used to determine the link between financial and economic development. The findings lent credence to the idea that financial development serves as a catalyst for economic growth. Panel data from Chinese regions

was used by Hasan et al. (2009) to examine the impact of financial and legal institutions on economic growth rates. According to the findings of the study, China's economic growth is strongly linked to improvements in the financial sector, political pluralism, and the legal environment. Saudi Arabia's economic growth and financial development were studied using long-term structural modelling by Masih et al. (2009). A one-way link was also discovered between the two variables. According to the authors, economic growth and financial development are more closely linked because of supply than demand.

Giuliano and Ruiz-Arranz used another important factor in their arguments for a hundred developing countries: (2009). Through the use of reliable data, they looked at how remittances affect economic growth and financial development. Remittance money may be used as an alternative source of investment if the country's banking sector is inefficient, according to the study's findings. Economic growth and financial development are linked in 10 new EU members, according to Caporale et al. (2009). Granger causality tests show that financial development is linked to economic growth, but not the other way around. Indicators of stock market and banking sector development were found to have a positive impact on growth, according to Saci et al. (2009). However, when stock market indicators were present, the development of the banking sector had a negative impact on economic growth. According to Leitao (2010a), economic growth and financial development are strongly linked in five BRICS countries and 27 EU countries between 1980 and 2006. Using VAR models from 1975 to 2005, Halkos and Trigoni (2010) examined the causal direction between economic growth and financial development, concluding that there is no direct relationship between economic growth and financial development in the short run, but a larger banking sector can have an adverse effect on economic growth. According to Adelakun (2010), economic growth and financial development are intertwined in Nigeria, a developing country. Ordinary Least Square Estimation Method (OLSEM) was used to analyse the collected data in econometric terms. Financial developments appear to have a significant positive impact on economic growth, according to the findings. The Granger causality test shows that financial development promotes economic growth, while evidence of causality shows that economic growth encourages financial institutions. Lastly, financial development, which includes financial diversification, contributes to economic growth. Economic growth is aided by financial development, according to Estrada, Donghyun and Ramayandi (2010). Based on a survey of 125 countries, they propose creating and expanding financial institutions to promote long-term development. Scientifically, this trend has been found in developing countries such as Nigeria, Bangladesh, Sri Lanka, and Nepal (Adelakun (2010); Perera & Paudel (2009); Mahmoudzadeh, Sadeghi, & Sadeghi (2013); Shrestha, 2005). Since income rises faster and further in a market with a functional capital



market, and inequality is always lower than when there is no functional capital market, Rötheli (2011) argues in favour of one. Both emerging and established countries can benefit from a strong financial sector, according to Rachdi and Hassene, (2011).

Various academics have examined this relationship from the perspective of different income groups. Developing, developed, and low-income countries are often referred to as a group. Short-run multivariate analysis and long-run causality tests were conducted using panel data from low and medium-income countries and regions in Hassan et al. (2011). For the poorest and most impoverished regions, there are two possible futures. Most regions have two-way causal links between economic growth and financial development, whereas the poorest regions only have one-way causation from growth to financial expansion.

An FDI for China was created by Hye and Dolgoplova (2011) in order to investigate the connection between the expansion of the financial sector and economic growth in China. FDI and economic growth are linked over time, as shown by the Johansen– Juselius co-integration technique's empirical results.

Integration and causal analysis were used by nce (2011) to examine the relationship between economic growth and financial development in Turkey from 1980 to 2010. According to the findings, economic growth and financial development have no long-term relationship. An investigation into the link between economic growth and financial development in Nepal was conducted using time-series data from 1975 to 2012. There were two tests used by the researcher: the co-integration and unit root tests. The Granger causality test was used to investigate the link between the two variables. According to the findings of this study, there is a strong correlation between economic growth and financial advancement. Despite this, it is impossible to tell which of them is in charge of the economy based on the facts. There is still a lot of work to be done.

Bittencourt (2012) argues that financial progress and macroeconomic stability are both essential for economic growth and the generation of new ideas. As a result of their research, Gurgul and Lukasz (2012) concluded that economic growth has a one-way relationship with stock market development and the development of the banking sector. As a result, the direction of causality is highly dependent on the area of the financial sector under investigation. Chinese economic growth and financial development at the local level were studied by Zhang et al. (2012), which gathered data from 286 Chinese cities between 2001 and 2006. In order to demonstrate the link between economic growth and financial development in Chinese cities, the researchers used first-difference, cross-sectional regression, and GMM estimation on panel data from the country. Ray (2013) used the granger causality test to examine the link between economic growth and financial development in India between 1990 and 2011. The findings show that India's progress is strongly influenced

by the country's financial development. Studying five emerging markets (Russia, Brazil, India, Turkey, and China) from 1989 to 2010, Mercan and Ismet (2013) used panel data analysis to find that financial development had a statistically significant impact on economic growth. Different rules apply in advanced economies. For eleven Asian countries, Hsueh et al. (2013) examined the relationship between economic growth and financial development between 1980 and 2007. Bootstrap panel Granger causality analysis was used in this study. Empirical evidence backs up the supply-leading theory. This study examines the link between Kenya's economic growth and financial development from 1971 to 2011, by Uddin et al. (2013). Economic growth is predicted to be boosted in the long run by the expansion of the financial sector, according to recent research.

Contrary to popular belief, Ram (2013) found a negative relationship between economic growth and financial development. Anecdotal evidence from 95 different countries confirmed this trend. Cross-country correlations are different from correlations for individual countries. There was no evidence to support the positive correlation between economic growth and financial development using individual nation multiple regression. Several studies have found a poor as well as a negative link between financial development and economic growth. Using a dynamic GMM model, Adusei (2013) found a strong correlation between economic growth and financial development in 24 African countries between 1981 and 2010. Hye and Wizarat looked into the relationship between financial liberalisation and economic growth (2013). Their findings suggest that, while financial liberalisation has a long-term positive impact on economic growth, the magnitude of that benefit may be small. Using data from 21 African countries from 1965 to 2008, Menyah et al. (2014) examine the relationship between economic growth and financial development. No evidence was found for financial or trade-driven growth in the study. The financial sector, according to Beck, Levine, and Popov (2018), has a multiplier effect in the economy. Since the 18th century, it has been observed empirically. Bank was established in England in 1750. The banking industry fueled the manufacturing sector during England's industrial revolution. When old technology was replaced with new, productivity increased and the quality of services and products improved. Investigations are underway into a new industrial and commercial sector. In literature, this is referred to as "creative destruction."

According to Biplab Kumar Guru and Inder Sekhar Yadav (2018), the BRICKS countries saw significant macroeconomic changes from 1993 to 2014. using the generalised moment system estimation method, the positive and substantial relationship between economic growth and financial development is studied (SYS-GMM). Size of financial intermediaries as well as domestic credit to a private sector (CPS) were used as indicators of banking sector growth, while turnover and the value of traded shares were used as indicators for stock market development... The macroeconomic control



variables included exports, inflation, and secondary school enrollment. According to SYS-GMM calculations, the CDR, CPS, and FDP have a strong positive correlation with economic growth in the presence of the stock market variable turnover ratio. Stock market development, for example, was found to have a significant and positive impact on economic growth in the presence of all selected indicators from the banking sector, including the value of traded shares. With FDP, however, the turnover ratio used to evaluate stock market efficiency has been shown statistically to have a significant effect on the growth of the selected economies. Ramesh Paudel and Chakra Pani Acharya (2019) used the longest possible time series data from Nepal, which spans 1965 to 2018, and a highly developed time series analysis technique known as the Autoregressive distributed lag approach of cointegration to investigate the positive and significant relationship between economic growth and financial development. Indicators included the percentage of domestic credit to the private sector (FDM2), gross capital formation (FDM4), the percentage of domestic credit by the banking sector (FDM3), and foreign direct investment (FDM5) and the percentage of broad money to GDP (FDM6) (FDM1). Control variables in the model included OPENNESS (trade openness) and LWAGEPOP (the percentage of working-age people in the total population). For example, domestic credit from the banking sector, private-sector-based loans from banks, and broad money all contribute to economic growth in a significant and similar way. While foreign direct investment may not be statistically significant, gross capital formation has a greater impact on economic growth. To measure openness in trade, one must look at a wide range of financial development indicators. Even though the model restricts FDI, the data shows that it has a statistically significant impact on growth. The working-age population (LWAGEPOP) variable has a negative impact on economic growth, contrary to expectations.

We can see from the discussion above that there is a strong correlation between economic growth and financial development. The results of prior investigations, on the other hand, have been wildly inconsistent. Some of the results of previous empirical studies on the link's influence and nature have been contradictory. We found resources for countries in Sub-Saharan Africa as well as those in developed countries. Some economists believe that economic growth is fueled by financial development, while others disagree. South Asian countries, on the other hand, have had relatively few studies looking at the link between economic growth and financial development. Bridges must be built and links must be better understood, which is the goal of this study.

III. METHODOLOGY

3.1. Identification of data and variables

For the purposes of this empirical study, the authors used annual time series data spanning the years 1982-2020. GDP

per capita at factor cost is a measure of economic growth. Three metrics are taken into account when attempting to gauge financial progress.

First, we have MCAPGDP, which measures market capitalization relative to GDP; second, PVCREDIT, which measures private sector credit relative to GDP; third, FINDEPTH, which measures financial depth. To put it another way, it's the addition of ratio of private sector debt to GDP and market capitalizations ratio to GDP. It is a general indicator of an economy's financial depth. Trade as a percentage of GDP (TOPGDP), the call money rate (CALLM) used as a substitute for the policy rate, and the percentage of GDP that is exported were all used as control variables in this study. A substitute for price stability is the consumer price index (CPI). The IMF's World Economic Outlook Database and the Central Statistical Organization's National Accounts Statistics were used to compile the data. The RBI's Handbook of Statistics on Indian Economy was also consulted. The long-term link between economic growth and financial development was examined empirically in this study using the following general specification:

$$LPCGDP = F(LFD, LCALLM, LTOPGDP, LCPI) \dots \dots \dots (1)$$

Here, it is a natural logarithmic transformation implied by the letters L. LFD, which stand for variables relating to financial development, LPCGDP, LTOPGDP, LCPI, and LCALLM, which stand for per capita GDP, trade openness, consumer price index and call money rate, respectively.

3.2. Co-integration with the ARDL Approach

Co-integration models developed by Pesaran et al. (2001) were used to examine the dynamic interplay and long-term link between financial growth and economic growth. The procedure is followed for four reasons.

- First, it is easy to use the bound test, unlike other multivariate co-integration techniques, because it allows the OLS method to be used to approximate the co-integrating link after the lag order has been selected.
- Second, that the bound test processes do not use variables pre-testing included in the model for unit root, unlike other approaches such as the Johansen and Juselius technique of 1992 and the Engle and Granger technique of 1987. All variables must be integrated sequentially in these methods (I [1]). For example, (Perron 1989, 1997; Kim et al., 2004) the ability to predict will be gone if this is not done. On the other hand, the ARDL approach can be used independently of the model's independent variables, whether they are I (0) or I (1). The process, however, will fail due to the existence of the I (2) series.
- Third, the test is more efficient with a small sample size, such as the samples used in this study.
- Fourth, the error correction technique combines long-term stability with short-term changes without sacrificing long-term data. A model called the ARDL model's



unconstrained error correction model is used to examine the short-term and long-term association with the help of equation (2).

$$\Delta \text{LPCGDP} = \delta_0 + \delta_1 T + \delta_2 \text{LFD}_{t-1} + \delta_3 \text{LCALLM}_{t-1} + \delta_4 \text{LTOPGDP}_{t-1} + \delta_5 \text{LCPI}_{t-1} + \sum_{i=1}^q \alpha_i \Delta \text{PCGDP}_{t-1} + \sum_{i=1}^q \beta_i \Delta \text{LFD}_{t-1} + \sum_{i=1}^q \mu_i \Delta \text{LCALLM}_{t-1} + \sum_{i=1}^q \sigma_i \Delta \text{LTOPGDP}_{t-1} + \sum_{i=1}^q \omega_i \Delta \text{LCPI}_{t-1} + \varepsilon_t \dots (2)$$

In this case, L represents the regressor and regressand have been converted to natural logs, and T represents the time trend, in accordance with our previous definitions of the variables. The error term is represented by ε_t and the other coefficients of long-run are represented by $\delta_2, \delta_3, \delta_4,$ and δ_5 , whereas the coefficients of short-run are represented by $\sigma, \omega, \mu, \alpha$ and β . Non-co-integration's the null hypothesis is $H_0: \delta_5 = \delta_4 = \delta_3 = \delta_2 = 0$ and the alternative hypothesis $H_1: \delta_5 \neq \delta_4 \neq \delta_3 \neq \delta_2 \neq 0$ entails that the co-integration between model series equations (2).

3.3. Steps in the ARDL-bound test

As previously stated, an OLS for the estimation of the 2nd equation to examine the presence of a distinct future link between variables with the help of f-test in the ARDL test to determine if the values of the lagged levels of variables are statistically significant, i.e., H_0 hypothesis contrary to H_1 hypothesis as previously stated. Equation (3) can be used to calculate the conditional ARDL long-run model for LPCGDPt once the co-integrating link is established in the second phase.

$$\Delta \text{LPCGDP} = \alpha_0 + \sum_{i=1}^q \delta_1 \text{PCGDP}_{t-1} + \sum_{i=1}^q \delta_2 \text{LFD}_{t-1} + \sum_{i=1}^q \delta_3 \text{LCALLM}_{t-1} + \sum_{i=1}^q \delta_4 \text{LCPI}_{t-1} + \sum_{i=1}^q \delta_5 \text{LTOPGDP}_{t-1} + \varepsilon_t \dots (3)$$

Sequences of ARDL models are selected using the Schwarz Bayesian Information Criterion ($q, q_1, q_2, q_3,$ and q_4). In the third and final stage, we get the short-run dynamic parameters from the long-run estimations that forecast an error correction model (ECM). This can be expressed using Equation (4), which is shown below.

$$\Delta \text{LPCGDP} = \mu + \sum_{i=1}^q \alpha_i \Delta \text{LPCGDP}_{t-1} + \sum_{i=1}^{q_1} \beta_i \Delta \text{LFD}_{t-1} + \sum_{i=1}^{q_2} \mu_i \Delta \text{LCALLM}_{t-1} + \sum_{i=1}^{q_3} \sigma_i \text{CPI}_{t-1} + \sum_{i=1}^{q_4} \omega_i \Delta \text{TRADE}_{t-1} + \phi \text{ECM}_{t-1} + \varepsilon_t \dots (4)$$

Where, ϕ is the speed adjustment value and $\sigma, \omega, \mu, \alpha$ and β are the short-run dynamic equilibrium coefficients.

3.4. The quality of the fit

The goodness of fit of the ARDL model is evaluated using stability and diagnostic tests.

a. Diagnostic tests: A functional form, normality, serial correlation, and heteroscedasticity of the model are diagnostic tests.

- Serial correlation: The Correlation LM Test is used in the model to confirm the existence of serial correlation. A statistically significant R^2 probability indicates that serial correlation does not exist in the model; otherwise a negligible R^2 probability indicates that serial correlation does exist in the model and thus rejects the null hypothesis.
- Heteroscedasticity: Autoregressive conditional heteroscedasticity is detected using Engle's ARCH-LM test statistic, introduced in 1982.

b. Stability test: Cumulative sum of residuals (CUSUM), as well as the cumulative sum of the squared residuals (CUSUMQ), are included in this stability test. Furthermore, macroeconomic series are likely to experience one or more structural breaks as a result of structural developments and changes in an economy. Consequently, in order to determine if a coefficient is stable over the long and short term, Brown et al. (1975) recommended the use of the CUSUMSQ and CUSUM tests. There are breakpoints to be specified in the Chow test. Structure alteration testing by using (CUSUM) and (CUSUMQ) does not necessitate prior knowledge of the location of the structural break. In other words, serial correlation tests, CUSUMQ tests, and CUSUM tests for model stability confirm the model's strength.

IV. EXPERIMENT AND RESULT

The two co-integration models (ARDL) given in this work are formulated taking into account multiple interpretations of financial developments. The two models that we created are (A) and (B). Models (B) and (A) the majority of their variables are similar, with the exception of the substitute variable for financial development. For example, in Model A, the regressand is per capita GDP (LPCGDP) and regressors are listed as follows:

- LMCAPGDP is a measure of market capitalization to GDP
 - LPVCREDIT is a measure of private sector credit to GDP.
 - Indicator of price stability index of consumer prices (LCPI)
 - LTOPGDP, the ratio of trade to GDP (LTOPGDP)
 - the call money rate (LCALLM)
- When using Model (B), the regressand is the LPCGDP, while the regressors are the following:
- market capitalization as a percentage of GDP (LMCAPGDP)
 - market capitalization and private sector credit



(LFINDEPTH) in relation to GDP

- Indicator of price stability is index of consumer prices (LCPI)
- the trade to GDP ratio (LTOPGDP); and
- Call money rate (LCALLM)

Model A: $LPCGDP = f(LMCAPGDP, LCPI, LPVCREDIT, CALLM, LTOPGDP)$

Model B: $LPCGDP = f(LCPI, LCALLM, LFINDEPTH, LTOPGDP)$

4.1 Result of a stationarity test

ADF and Ng–Perron KPSS, Phillips–Perron unit root tests are used to determine the integration's order in this study. For the most part, the results are summarised in Tables 2 and 3. The results show that the variables are not stationary at all levels. In this case, the next step is to conduct stationarity tests on the differenced variables by differencing the variables once. Consequently, it is important to note that each of the variables in current research is integrated of the first order, that is, difference-stationary I (1)

Table- 2 Stationarity test of variables (with trend and intercept)

Variables	KPSS	PP	ADF	Stationarity status
LMCAPGDP	0.598	-2.027	-0.9519	I (1)
		-		
Δ LMCAPGDP	0.0625	9.1533	-6.007	
LCPI	0.5827	1.1807	0.0508	I (1)
		-		
Δ LCPI	0.0808	8.8534	-4.1524	
LPVCREDIT	0.5827	1.1807	0.0508	I (1)
		-		
Δ LPVCREDIT	0.3094	4.8536	-2.1526	
		-		
LCALLM	0.3874	2.5871	-2.6722	I (1)
Δ LCALLM	0.226	-8.782	-4.9707	
LFINDEPTH	0.6104	-1.377	-0.9858	I (1)
		-		
Δ LFINDEPTH	0.0715	8.5178	-5.6398	
LTOPGDP	0.6767	1.092	1.6678	I (1)
		-		
Δ LTOPGDP	0.4546	6.4807	-6.5353	
LPCGDP	40.7229	4.317	2.2806	I (1)
		-		
Δ LPCGDP	0.4756	3.9181	-3.9108	

Note: L indicates that the variables converted into natural logs, and Δ denotes the 1st difference in the series.

Source: Authors's calculation by using E-view software

Table- 3 Ng–Perron test (with trend and intercept)

Variables	MZa	MZt	MSB	MPT
LPCGDP	-3.8882	-1.2483	0.3211	21.57
LPVCREDIT	-7.6205	-1.9036	0.2497	12.0588
LMCAPGDP	-10.178	-2.1815	0.2144	9.28289
LFINDEPTH	-11.6092	-2.3923	0.207	7.9365
LCALLM	-11.4627	-2.3621	0.205	8.1097
LTOPGDP	-5.4972	-1.6431	0.2989	16.532
LCPI	-11.6857	-2.3898	0.2044	7.9376
Δ LPCGDP	-18.104	-2.955	0.1808	7.0515



ALPVCREDIT	-6.9501	-2.8532	0.1667	13.123
ALMCAPGDP	-18.469	-2.8576	0.1718	6.8175
ALFINDEPTH	-19.3361	-2.5749	0.194	6.875
ALCALLM	-28.866	-2.981	0.023	0.105
ALCPI	-18.2141	-2.6952	0.1444	6.9008
ALTOPGDP	-19.9673	-2.9219	0.1747	6.663

Note: L signifies the natural logarithm, and Δ denotes the 1st difference of the series.
Source: Authors's calculation by using E-view software

Furthermore, all of those variables will be stationary and integrated up to degree of order one after the first difference has been taken. According to the results of Phillips–Perron unit roots testing, each variable has been integrated to the first order of integration. According to the ADF test, this is the case possibility co-integration is a strong because of the linear combination of the variables. It is for that reason authoritative to check for the co-integration existence, after estimating the optimal lags' number, the bound test will be used. It's completed by means of the criteria of akaike and Swartz.

4.2 Results of the ARDL-bound test

ARDL is used to determine the long-term relationship between the variables after determining the order of integration. For the 1st difference section of equation (3), we can use an OLS regression approach and after that when lagged level variables' parameters are included in first regression, a joint significance test is done. Using F-statistics, we can rule out the null hypothesis that the coefficients of the lag level variables in equation (3) are equal to zero. The results of the estimated F-statistics and critical values are reported in Tables 4 and 5 respectively.

Table- 4 ARDL bound test: bound testing to co-integration

Indicators	Model A	Model B
Optimal lag	2	2
F-statistics	8.6523	8.2459

Note: Expected equation: $LPCGDP = F(LFD, LCALLM, LTOPGDP, LCPPI)$

Table- 5 ARDL bound test: critical values

Level of significance (%)	Pearson (2001)		Naryaran (2005)	
	Lower bound	Upper bound	Lower bound	Upper bound
1	3.8101	4.9201	4.7601	6.2001
5	3.0501	3.4701	3.4701	4.6301
10	2.6801	3.8901	2.9801	3.9101

It is shown in table 4 and 5 the estimated F-statistics for model A (8.6523) is bigger than the critical values of the bound's upper level of model A (4.9201) at 1% level of significance, similarly, in model B the F- statistics (8.2459) is bigger than the critical values of bounds upper level (6.2001) at 1% level of significance. The evidence of the bound test validates the long-run link.

Symbolically,
Model (A)

F-stat >Critical values of upper bound at 1% LOS
8.6523 > 4.9201

Model (B)
F-stat >Critical values of upper bound at 1% LOS
8.2459 > 6.2001

4.3 Result of Diagnostic test

The ARDL bound test is shown in the table no.6.



Table- 6 ARDL bound test diagnostic tests

Diagnostic tests indicators	Model A	Model B
Normality J-B value	0.9795	0.8775
Serial correlation LM test	1.6766	1.3924
Heteroscedasticity test (ARCH)	1.3088	1.3807
Ramsey reset test	0.0468	0.0537

According to the calculated statistics, successfully the model specification appears to pass all diagnostic tests.

4.4. The end result of the long-term coefficients were calculated using the ARDL method.

The next step is to determine the short- and long-term coefficients of the ARDL model. Models are selected using the Schwarz Bayesian criteria. The ARDL method's predicted future values for two different model specifications are shown

in Table 9. All three financial development measures (LPVCREDIT, LMCAPGDP, and LFINDEPTH) have predicted positive coefficients in the long run, according to empirical data. However, PVCREDIT's role in determining India's economic development is only 10%.

Table-7 Estimated long-run coefficients using ARDL approach (dependent variable: LPGDP)

Regressors	Model (A)		Model (B)	
	Coefficient	t-ratio	Coefficient	t-ratio
	0.1044*			
ΔLPVCREDIT	(1.6988)	0.102		
	0.0325***			
ΔLMCAPGDP	(3.2336)	0.003		
ΔFINDEP			0.06432	(3.7115)***
	-0.00644			
ΔCALLM	(-0.61184)	0.548	-0.0077	(-0.7820)
	-0.0984**			
ΔLTOPGDP	(-2.0986)	0.047	-0.077	(-1.8316)*
	0.09645*			
ΔLCPI	(1.8361)	0.081	0.05681	(2.5091)
	0.6591*			
ΔCONS	(1.9427)	0.066	0.3626	(1.8524)*
	-0.1717*			
ECM (-1)	(-2.4743)	0.016	-0.077	(-2.6288)*
Robustness indicators				
R ²		0.69385		0.69246
Adjusted R ²		0.61035		0.58994
D.W. stat		2.3437		2.2157
SE regression		0.01468		0.015068
RSS		0.0047474		0.0047689
F-stat		7.8802(0.000)***		9.9712(0.000)*

Note: The Schwarz Bayesian criteria are used to determine the lag order of models. Model A is ARDL (1, 0, 0, 1, 0, 0), whereas Model B is ARDL (1, 0, 1, 0, 0). Figures in (#)

parentheses are estimated t-values, while values [#] are p-values which are significant at * 1, ** 5 and *** 10% levels.



Credit (LPVCREDIT) is significant at 10% level. This means the economy grows by 60.90 percent for every 10 percent increase in credit (LPVCREDIT). The call money rate (LCALLM) was used as a substitute for policy indicators in the model. In model (A) it is significant at 5% level and in model B) has significant at 1% level. Both models showed negative & statistical significance values. In India, the LCALLM is a major contributor to economic growth.

The demand for investments in India is affected by changes in short-term interest rates. The coefficient for LTOPGDP indicators is statistically insignificant, but the indicator's negative sign is clear that the plan's reliance on exports to generate growth is called into question if the LTOPGDP reading is negative. Trade openness will have a negative impact on India's economy because of the country's reliance on capital-intensive imports. As Eggoh (2010) agrees, we can conclude that this is the case. Economics and financial development have favourable relationship, according to LCPI

coefficients. Therefore, an increase in the price level of India is favourable for investment. When interest rates fall and the money supply grows, the economy will be able to support more growth. Findings that are at odds with Fischer's (1991 and 1993) findings.

4.5. Dynamic results from the ECM ARDL are in the short term

A correction term (ECM -1) is used to address model flaws. The error correction coefficient (ECC) is the correction factor measures how much of an economic growth imbalance is in one period and corrected in subsequent periods. In the aftermath of an event, a country's normal growth rate is increased by a higher residual growth rate. The error correction term ranges from -1 to 0. If the value is -1, the current year's growing imbalance will be eliminated. Table 8 shows the results of short-run dynamics using the ARDL's ECM version.

Table- 8 Error correction representation for the selected ARDL model (dependent variable: Δ LPCGDP)

Regressors	Model (A)		Model (B)	
	Coefficient	t-ratio	Coefficient	t-ratio
	0.1044*			
Δ LPVCREDIT	(1.6988)	0.102		
	0.0325***			
Δ LMCAPGDP	(3.2336)	0.003		
Δ FINDEP			0.06432	(3.7115)***
	-0.00644			
Δ LCALLM	(-0.61184)	0.548	-0.0077	(-0.7820)
	-0.0984**			
Δ LTOPGDP	(-2.0986)	0.047	-0.077	(-1.8316)*
	0.09645*			
Δ LCPI	(1.8361)	0.081	0.05681	(2.5091)
	0.6591*			
Δ CONS	(1.9427)	0.066	0.3626	(1.8524)*
	-0.1717*			
ECM (-1)	(-2.4743)	0.016	-0.077	(-2.6288)*
Robustness indicators				
R²		0.69385		0.69246
Adjusted R²		0.61035		0.58994
D.W. stat		2.3437		2.2157
SE regression		0.01468		0.015068
RSS		0.0047474		0.0047689
F-stat		7.8802(0.000)***		9.9712(0.000)*

Note: Significance at: *** 10%, ** 5, and * 1 levels; Figures in parenthesis are approximated t-values; Residual Sum of Squares (RSS)

It has been determined that Model A's calculated value of ECM (-1) is - 0.1717, which is significant at the level of 1%, and Model B's calculated error correction term ECM (-1) is - 0.0770 which is also significant at the level of 1%. This suggests that in the next year, after following a shock, the

return to equilibrium growth has been delayed a little. Error correction coefficients in both models have a statistically significant negative sign. Both the LPVCREDIT, FINDEPTH and LMCAPGDP variables have statistically significant and positive coefficients. Trade liberalisation is a significant long-



and short term control variable (LTOPGDP). In both models, in the short term, the call money rate (LCALLM) is insignificant, whereas in the short term inflation (LCPI) is significant at a 1% level in Model A.

4.6 The results of our stability testing were as follows:

It was found that the ARDL–short ECM and long-term ECM coefficients are stable in the CUSUM-squared or CUSUM tests conducted at a 5% LOS (level of significance). When the

CUSUM line is in the middle of the LOS lines, the model is stable. The CUSUM line becomes unstable if it crosses either of these two lines.

Model A's CUSUM and CUSUMQ tests are shown in Figures 1 and 2. Model B's CUSUM and CUSUMQ tests are shown in similarly in Figures 3 and 4. According to the CUSUM and CUSUMQ tests, the ARDL's short- and long-term coefficients are stable.

Plot of Cumulative Sum of Recursive Residuals

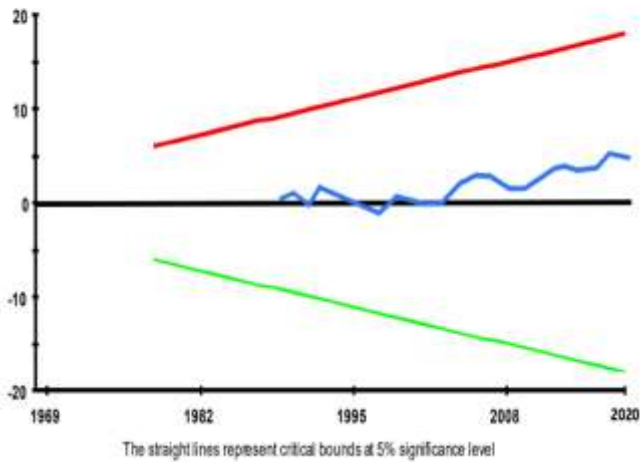


Fig.1. CUSUM test of Model A

Plot of Cumulative Sum of Recursive Residuals

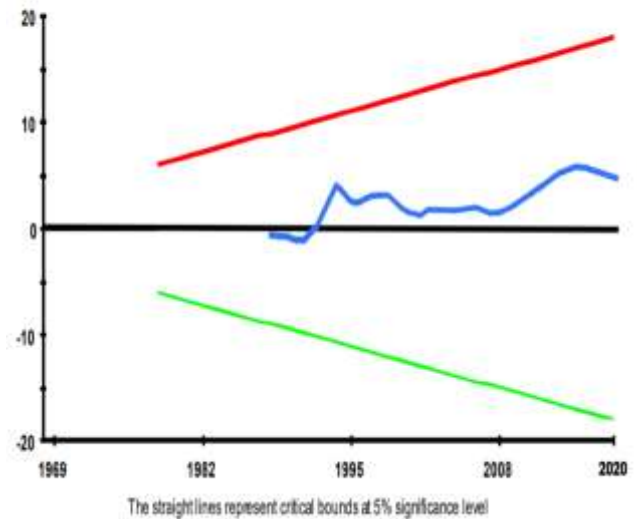


Fig.3. CUSUM test of Model B

Plot of Cumulative Sum of Squares of Recursive Residuals

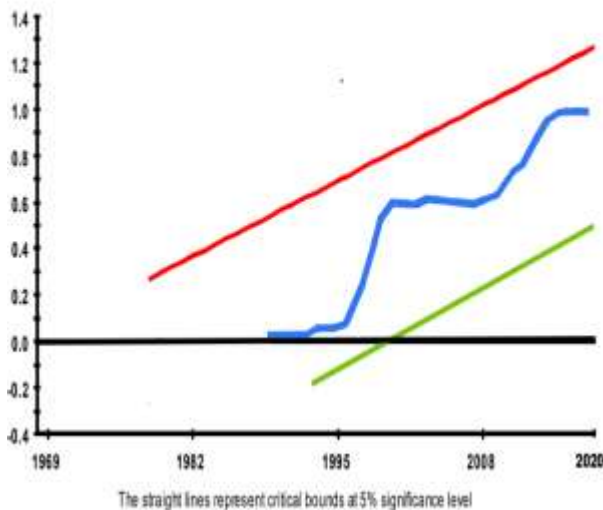


Fig.2. CUSUMQ test of Model A

Plot of Cumulative Sum of Squares of Recursive Residuals

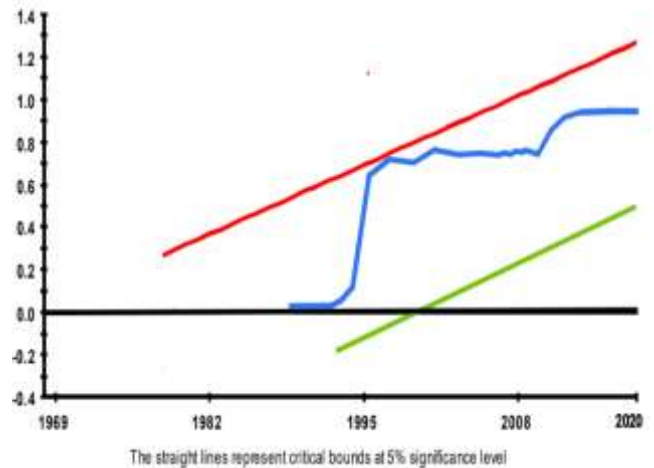


Fig.4. CUSUMQ test of Model B



IV. CONCLUSION

Data from 1982 to 2020 is used in this study to examine the causal link among India's economic and financial development. The investigation is centred on a single question. Is it true that in the process of economic expansion, financial development precedes the real sector or vice versa? An economic progress proxy based on per capita GDP at factor cost was used in the research to answer the question above. There are three financial development indices are:

The addition of ratio of private sector debt to GDP and market capitalizations. It is a general indicator of an economy's financial depth. You used this as an indicator as to the financial depth of an economy. Credit from the private sector to GDP is known as (PVCREDIT) and ratio of market capitalization (MCAPGDP). Analysis of the impact of the three control variables on economic growth included trade as a percentage of GDP, the call money rate, and the Consumer Price Index. We used two different models to arrive at the structural equation when comparing market and bank-related financial development indicators. Economic and financial development relationship in the long and short term were studied using the ARDL technique for cointegration.

The ARDL test results show that economic growth and financial development metrics have a long-term correlation. According to the findings, India's economic growth is influenced by both market- and bank-related indices of financial development. The study's findings are critical for Indian policymakers. Due to its dominance of India's financial sector, the banking sector has a significant impact on economic growth. Given the ability of Indian banks to issue additional credit, there is still space for Indian banks to distribute credit to the economy's productive sectors. As a result, in order to maintain the rapid economic development, Indian banks must build solid ties with the real estate sector. The findings will be useful to policymakers who want to maintain both economic and financial growth at the same time.

V. REFERENCE

- [1] Adamopoulos, A., 2008. Financial development and economic growth. An empirical analysis for Ireland. *International Journal of Economic Sciences and Applied Research*, 3(1): 75-88.
- [2] Adusei, M. (2013), "Finance-growth nexus in Africa: a panel generalized method of moments (GMM) analysis", *Asian Economic and Financial Review*, Vol. 3 No. 10, pp. 1314-1324.
- [3] Ahluwalia, M.S. (2002), "Economic Reforms in India since 1991: has gradualism worked? ", *Journal of Economic Perspectives*, Vol. 16 No. 3, pp. 67-88.
- [4] Al-Yousif, Y.K., 2002. Financial development and economic growth: Another look at the evidence from developing countries. *Review of Financial Economics*, 11(2): 131—150.
- [5] Ansari, M.I., 2002. Impact of financial development, money, and public spending on Malaysian national income: An econometric study. *Journal of Asian Economics*, 13(1): 72-93.
- [6] Arestis, P. and P. Demetriades (1996), "Finance and Growth: Institutional Consideration and Causality" Working Paper No. 5, Department of Economics, University of East London.
- [7] Adelakun, O. J. 2010. Financial Sector Development and Economic Growth in Nigeria. *International Journal of Economic Development Research and Investment*, 1(1), 25 41.
- [8] Ang, J. B. and W. J. McKibbin. 2007. "Financial liberalization, financial sector development and growth: evidence from Malaysia." *Journal of Development Economics* 84(1): 215-233
- [9] Bencivenga, V.R. and Smith, B.D. (1993), "Some consequences of credit rationing in an endogenous growth model", *Journal of Economic Dynamics and Control*, Vol. 17 Nos 1/2, pp. 97-122.
- [10] Bittencourt, M. (2012), "Financial development and economic growth in Latin America: is schumpeter right? *Journal of Policy Modeling*, Vol. 34 No. 3, pp. 341-355.
- [11] Buffie, E. (1984), "Financial repression, the new structuralists, and stabilization policy in semi industrialized economies", *Journal of Development Economics*, Vol. 14 No. 3, pp. 305-322.
- [12] Beck, T., Levine, R., & A. Popov. 2018. Evidence on finance and economic growth. *Handbook of Finance and Development*, (2115), 63 10
- [13] Calderon, C. and Lin, L. (2003), "The direction of causality between financial development and economic growth", *Journal of Development Economics*, Vol. 72 No. 1, pp. 321-334.
- [14] Christopoulos, D.K. and E.G. Tsionas, 2004. Financial development and economic growth: Evidence from panel unit root and co-integration tests. *Journal of Development Economics*, 73(1): 55–74.
- [15] Chen, C.H., 2002. Interest rates, savings and income in the Chinese economy. *Journal of Economic Studies*, 29(1): 59-74
- [16] Cargill, T.F. and E. Parker, 2001. Financial liberalization in China-Limitations and lessons of the Japanese regime. *Journal of the Asia Pacific Economy*, 6(1): 1-21.
- [17] Das, P.K. and Guha-Khasnobis, B. (2008), "Finance and growth an empirical assessment of the Indian economy", in Guha-Khasnobis, B. and Mavrotas, G. (Eds), *Financial Development, institutions, growth and Poverty Reduction*, Palgrave Macmillan, New York, NY, pp. 120-140.
- [18] Demetriades, P.O. and Hussein, K.A. (1996), "Does financial development cause economic growth? *Time*



- series evidence from 16 countries”, *Journal of Development Economics*, Vol. 51 No. 2, pp. 387-411.
- [19] De Gregorio, J. and P. Guidotti, 1995. Financial development and economic growth. *World Development*, 23(3): 433-448.
- [20] Deidda, L. and B. Fatouh, 2002. Non-linearity between finance and growth. *Economics Letters*, 74(3): 339 – 345.
- [21] Diamond, D.W. (1984), “Financial intermediation and delegated monitoring”, *The Review of Economic Studies*, Vol. 51 No. 3, pp. 393-414
- [22] De Gregorio, J. and P.E. Guidotti (1993) “Financial Development and Economic Growth”, International Monetary Fund, Research Department.
- [23] Donny Tang (2006) “The effect of financial development on economic growth: evidence from the APEC countries, 1981--2000” *Applied Economics*, Taylor and Francis Journals, 38(16), 1889-1904.
- [24] Demirgüç-Kunt, A., and R. Levine. 2008. Finance, Financial Sector Policies, and Long-Run Growth. Policy Research Working Paper WPS4469, The World Bank, Washington, DC.
- [25] Engle, R.F. and Granger, C.W.J. (1987), “Co-integration and error correction representation: estimation and testing”, *Econometrica*, Vol. 55 No. 1, pp. 251-276.
- [26] Estrada, G., Donghyun, P., & A. Ramayandi. 2010. Financial development and economic growth in developing Asia. *Asian Dev. Bank*, 233(233), 1 63.
- [27] Eggoh, J.C. (2010), “Financial development and growth: a panel smooth regression approach”, *Journal of Economic Development*, Vol. 35 No. 1, pp. 15-33.
- [28] Fischer, S. (1991), “Growth, macroeconomics, and development”, *NBER Macroeconomics Annual*, MIT Press, Cambridge, MA, pp. 329-364.
- [29] Fischer, S. (1993), “The role of macroeconomic factors in growth”, *Journal of Monetary Economics*, Vol. 32 No. 1, pp. 485-511.
- [30] Goldsmith, R.W., 1969. Financial structure and development. New Haven CN: Yale University Press.
- [31] Greenwood, J. and Jovanovic, B. (1990), “Financial development, growth, and the distribution of income”, *The Journal of Political Economy*, Vol. 98 No. 5, Part 1, pp. 1076-1107.
- [32] Gurgul, H. and Lukasz, L. (2012), “Financial development and economic growth in Poland in transition: causality analysis”, MPRA Paper No. 38034.
- [33] Güryay, E., O. V. Safakli and B. Tüzel (2007) “Financial Development and Economic Growth: Evidence from Northern Cyprus” *International Research Journal of Finance and Economics*, 8, 57-62
- [34] Gurley, J. G., & E. S. Shaw. 1955. Financial Aspects of Economic Development. *The American Economic Review*, 45(4), 515 538.
- [35] Gautam, B. P. 2012. Role of financial development in economic growth of Nepal: An Empirical Analysis. *NRB Economic Review*, 1 16.
- [36] Goletovic, A. (1996) “Finance and Growth: A Synthesis and Interpretation of the Evidence” in *Banca Nazionale del Lavoro Quarterly Review*, 49, 59-82
- [37] Halkos, G.E. and Trigoni, M.K. (2010), “Financial development and economic growth: evidence from the European Union”, *Managerial Finance*, Vol. 36 No. 11, pp. 949-957.
- [38] Hasan, I., P. Wachtel and M. Zhou, 2009. Institutional development, financial deepening and economic growth: Evidence from China. *Journal of Banking & Finance*, 33(1): 157-170
- [39] Harb, Nasri and Al-Awad, Mouawiya (2005) “Financial Development and Economic Growth in the Middle East” *Applied Financial Economics*, 15, 1041-1051.
- [40] Hye, Q.M.A. and Irina Dolgoplova (2011), “Economics, finance and development in China: Johansen-Juselius co-integration approach”, *Chinese Management Studies*, Vol. 5 No. 3, pp. 311-324
- [41] Hsueh, J.S., Hu, Y.H. and Tu, C.H. (2013), “Economic growth and financial development in Asian countries: a bootstrap panel Granger causality analysis”, *Economic Modelling*, Vol. 32 No. 1, pp. 294-301
- [42] İnce, M., 2011. Financial liberalization, financial development and economic growth: An empirical analysis for Turkey. *Journal of Yasar University*, 23(6): 3782-3793.
- [43] Jeremy Greenwood, & Jovanovic Boyan. 1990. Financial Development , Growth , and the Distribution of Income, *Journal of Political Economy*, 98(5), 1076 1107.
- [44] Johansen, S. and Juselius, K. (1990), “Maximum likelihood estimation and inference on cointegration, with applications to the demand for money”, *Oxford Bulletin Economics Statistics*, Vol. 52 No. 2, pp. 169-210.
- [45] Kim, T.H., Leybourne, S. and Newbold, P. (2004), “Behaviour of Dickey-Fuller unit-root tests under trend misspecification”, *Journal of Time Series Analysis*, Vol. 25 No. 5, pp. 755-764
- [46] King, R. G., and R. Levine. 1993. “Finance, Entrepreneurship, and Growth: Theory and Evidence.” *Journal of Monetary Economics* 32(3):513–42
- [47] Levine, R. 1997. Financial development and economic growth: views and agenda. *Journal of Economic Literature*, 35(2), 688 726.
- [48] Loayza, N. & R. Ranciere. 2004. Financial Development, Financial Fragility, and Growth, *The World Bank*, DC.
- [49] Leitao, N.C. (2010), “Financial development and economic growth: a panel data approach”, *Theoretical and Applied Economics*, Vol. 10 No. 551, pp. 15-24.



- [50] Levine, R. (1997), "Financial development and economic growth: views and agenda", *Journal of Economic Literature*, Vol. 35, pp. 688-726.
- [51] Lucas, R.E. (1988), "On the mechanics of economic development", *Journal of Monetary Economics*, Vol. 22 No. 1, pp. 3-42.
- [52] Levine, R., N. Loayza and T. Beck, 2000. Financial intermediation and growth: Causality and causes. *Journal of Monetary Economics*, 46(1): 31—77.
- [53] Lucas, R.E., 1988. On the mechanics of economic development. *Journal of Monetary Economics*, 22(1): 3-42.
- [54] Luintel, K.B. and M. Khan, 1999. A quantitative reassessment of the finance—growth nexus: Evidence from a multivariate VAR. *Journal of Development Economics*, 60(2): 381-405.
- [55] Mercan, M. and G. Ismet, 2013. The effect of financial development on economic growth in BRIC-T countries: Panel data analysis. *Journal of Economics and Social Studies*, 3(1): 199-218.
- [56] Menyah, K., Nazlioglu, S. and Yemane, W.R. (2014), "Financial development, trade openness and economic growth in African countries: new insights from a panel causality approach", *Economic Modelling*, Vol. 37 No. 1, pp. 386-394.
- [57] McKinnon, R. I. 1973. *Money and capital in economic development*: Brookings Institution Press.
- [58] Müslümov, A. and G. Aras, 2002. Causality relationship between capital market development and economic growth: OECD countries sample. *Economy Management and Finance*, 17(198): 90-100.
- [59] Masih, M., A. Al-Elg and H. Madani, 2009. Causality between financial development and economic growth: An application of vector error correction and variance decomposition methods to Saudi Arabia. *Applied Economics*, 41(13): 1691-1699
- [60] Odhiambo, N.M., 2008. Financial depth, savings and economic growth in Kenya: A dynamic causal linkage. *Economic Modeling*, 25(4): 704 — 713.
- [61] OZTURK, Ilhan (2008) "Financial Development and Economic Growth: Evidence From Turkey, *Applied Econometrics and International Development* "Euro-American Association of Economic Development, 8(1), 85-98
- [62] Perera, N., & R. C. Paudel. 2009. Financial development and economic growth in Sri Lanka. *Applied Econometrics and International Development*, 9(1), 157-164.
- [63] Perron, P. (1989), "The Great crash, the oil price shock, and the unit root hypothesis", *Econometrica*, Vol. 57 No. 6, pp. 1361-1401.
- [64] Perron, P. (1997), "Further evidence on breaking trend functions in macroeconomic variables", *Journal of Econometrics*, Vol. 80 No. 2, pp. 355-385.
- [65] Pesaran, H.M., Shin, Y. and Smith, R.J. (2001), "Bounds testing approaches to the analysis of level relationships", *Journal of Applied Econometrics*, Vol. 16 No. 1, pp. 289-326.
- [66] Patrick, H.T., 1966. Financial development and economic growth in underdeveloped countries. *Economic Development and Cultural Change*, 14(2): 174-189.
- [67] Pagano, M., 1993. Financial markets and growth: An overview. *European Economic Review*, 37(2): 613 – 622.
- [68] Rachdi, H. and Hassene, B.M. (2011), "The causality between financial development and economic growth: panel data co-integration and GMM system approaches", *International Journal of Economics and Finance*, Vol. 3 No. 1.
- [69] Rötheli, T.F. (2011), "The Kuznets curve: determinants of its shape and the role of finance", *Studies in Economics and Finance*, Vol. 28 No. 2, pp. 149-159.
- [70] Robinson, J. (1952), "The generalization of the general theory", *The Rate of Interest and Other Essays*, Macmillan, London.
- [71] Ram, R. 2013 Financial development and economic growth: Additional evidence, *The Journal of Development*, 37 41.
- [72] Singh, A., 1997. Financial liberalization, stock markets and economic development. *Economic Journal*, 107(442): 771 – 782.
- [73] Saci, K., Giorgioni, G. and Holden, K. (2009), "Does financial development affect growth? ", *Applied Economics*, Vol. 41 No. 13, pp. 1701-1707.
- [74] Shan, J. (2005), "Does financial development 'lead' economic growth? A vector autoregression appraisal", *Applied Economics*, Vol. 37 No. 12, pp. 1353-1367.
- [75] Stiglitz, J.E. and Weiss, A. (1983), "Incentive effects of terminations: applications to the credit and labor markets", *The American Economic Review*, Vol. 73 No. 5, pp. 912-927.
- [76] Shan, J.Z., A.G. Morris and F. Sun, 2001. Financial development and economic growth: An egg and chicken problem. *Review of International Economics*, 9(3): 443-454.
- [77] Schich, S. and F. Pelgrin, 2002. Financial development and investment: Panel data evidence for OECD countries from 1970 to 1997. *Applied Economics Letters*, 9(1): 1-7.
- [78] Shaw, E. 1973. *Financial Deepening in Economic Development*. New York: Oxford University Press.
- [79] Ünalmis, D. (2002) "The Causality Between Financial Development And Economic Growth: The Case Of Turkey", *Research Department Working paper no 003*, The Central Bank of the Republic of Turkey
- [80] Uddin, S.G., Sjö, B. and Shahbaz, M. (2013), "The causal nexus between financial development and



economic growth in Kenya”, *Economic Modelling*, Vol. 35 No. 1, pp. 701-707

- [81] Yang, Y.Y. and M.H. Yi, 2008. Does financial development cause economic growth? Implication for policy in Korea. *Journal of Policy Modeling*, 30(5): 827-840.
- [82] Zhang, J., L. Wang and S. Wang, 2012. Financial development and economic growth: Recent evidence from China. *Journal of Comparative Economics*, 40(3): 393-412.