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Linkages between financial sector and real economy: An empirical analysis on Indian context

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Abstract
Financial sector and real sector are interrelated. Financial sector mobilize credit to the real sector and allocating it for some productive activity, which again accelerates economic growth. The more developed the financial sector, better would be the intermediation of credit from financial sector to real sector. There are some main functions between financial sector and real sector. First, financial sector mobilizes credit from savers to investors. It diverse credit from any individual to some productive activity, which may incur returns in future, thereby enabling economic growth. Second, financial sector facilitates exchange of goods and services by providing the mechanism of transaction of payment. Third, Financial sector also transfers the risk or managing the risk by investing in diversified portfolio. It also facilitates intertemporal risk sharing over generation. In this diverse ways the financial sector and real sector are interconnected. Generally, in developed countries the financial sector is more developed compare to less develop or developing countries. In case of India, generally called developing country, financial sector may have some crucial role in channelization of credit to some productive investment which again accumulates economic growth.
Indian financial sector has undergone several challenges after the financial sector reform in 1991. As a result of financial sector reform financial intermediation has increased over time. The widening and deepening of financial sector invites more investable funds which again accentuates more productive investment which leads to higher economic growth. This increases the cyclical flow of credit of higher savings, improved investment efficiency and higher real economic growth.
Till now there are very few numbers of studies which are analyzing the relation between the financial sector and real sector. This paper also tries to explore the causal relationship between the financial sector and real economy. Thus the main objective of this study is to identify the interrelationship and direction of causality between the financial sector and real sector for the period 1990-2022 in Indian context and also explore the long run and short run association between the financial and real sector for the Indian economy.

Keywords: Financial sector, real sector, real economic growth, channelization of credit, financial intermediation, India

Introduction

Financial sector and real sector are interrelated. Financial sector mobilize credit to the real sector and allocating it for some productive activity, which again accelerates economic growth. The more developed the financial sector, better would be the intermediation of credit from financial sector to real sector. In the reverse way house hold sector's accumulated credit as savings again transmitted to the financial sector. So there must be a well-connected interrelationship between the financial sector and real sector.

Financial sector includes both the market based and the institutional based (Goswami and Dutta, 2019) [3]. Thus, financial development in an economy affects the real sector through the performance of the stock market, the credit market and the banking sector. Foreign investment also increased after the liberalization of financial sector. So inflow of foreign capital also affects the real sector performance of Indian economy. In the transitional developing economy like India, the relationship between these two sectors becomes an important empirical issue after the financial sector reforms in 1991.

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Review of literature

Financial sector development is important for economic growth and capital accumulation. Many studies found evidence that supports the existence of a positive association between the financial development and economic growth (King and Levine, 1993, Sahoo, 2013) [6, 11]. It is observed that the countries with more developed financial system have higher economic growth than the countries with less developed financial system. The contribution of a financial system to growth originates mainly from improved channelization of credit as well as efficient payment system. Technologically improved financial system can more efficiently internalize the savings for productive investment. A well-functioning financial system can motivate higher economic growth (King and Levine, 1993) [6]. Moreover, as savings are internalized by financial intermediaries, technologically more efficient financial system provides savers with a relatively higher yield, also contributes directly to a rise in capital productivity and a correspond speeding up of growth (King and Levine, 1993) [6].

Real economy or the tangible world of jobs, goods and services are connected with the more intangible world of finance or money, credit flow, interest rates and the stock market. There exists not only unidirectional relationship between financial sector and real sector but it may be a bidirectional relationship between these two sectors (Mordi, 2010) [9]. Mordi (2010) [9] discussed theoretically the relationship between the financial sector and real sector by considering some basic functions that a financial system provides in facilitating growth in the real economy. Financial system mobilizes saving, produces information for production and allocation of capital, monitors investment decision that enhance real sector performance. In this study linkages go both ways from the financial to the real sector and from the real to the financial sector.

At first Schumpeter (1911) [12] study found that credit plays a major role for the innovative activity in the industrial sector. The innovation in product and production method makes the long wave of upswings and downswings in economic activity (Schumpeter, 1911) [12]. Peetz and Genreith (2011) [10] theoretically, and Levine and Zervos (1998) [7] and Beck and Levine (2004) [13] empirically investigated the relationship between the financial sector development and the economic growth. They found the existence of a fundamental relationship between the financial sector and gross domestic product.

In addition to large number of studies focusing on the developed countries in finding out the link between the financial sector and real sector, a good number of studies attempted to look into the similar issues in India. For example, Chakraborty (2008, 2010) [1] examined the relationship between economic growth, stock market liquidity and banking sector development with Indian data during the post liberalization period. Mahajan and Verma (2014) [8] also investigated the relationship between financial development and economic growth for the Indian economy and found that in short run financial development did not influences economic growth but in long run financial development causes economic growth. Again, Seema (2016) [14] studied the relationship between the financial development and economic growth in Indian context using

time series data from 1991- 91 to 2012-13 periods and found a strong relationship between financial deepening and economic growth.

This study tried to focus on the relationship between the financial sector and real economy from the period 1990-2022 on Indian economy. For serving this purpose, Market Capitalization, Turn over Ratios and Broad Money (M3) are used as financial sector variables and Gross Domestic Product is used for representing real sector variable. Here Exchange Rate, Wholesale Price Index and Call Money Rate are control variables. Wholesale Price Index used as proxy of inflation rate and Call Money Rate used as proxy of interest rate. We are considering these variables after careful review of relevant literature on the various aspect of financial sector development.

Data sources and estimation method

The annual data of financing are collected from year 1996 to 2022 from National Account Data (2018), provided by the Ministry of Statistics and Program Implementation, Government of India. Annual data of GDP are collected from year 1990 to 2022 from Handbook of Statistics on Indian Economy published by the Reserve Bank of India. GDP and financing are figured at constant 2011-12 prices and reported in rupees crore.

We are also taking the annual data of market capitalization [1] of BSE, annual turnover [2] at BSE, broad money (M3), Exchange Rate, Wholesale Price Index and Call Money Rate from the time period 1990 to 2021 from different issues of Handbook of Statistics on Indian Economy published by the Reserve Bank of India. Turnover pertains to the spot market at BSE.

As all of the series are captured for year wise for long periods, time series econometrics is applied here. Unit root test and Vector auto regression models are used to analyze stationarity of the data series and causal relationship between the variables respectively. Graphical analysis also done based on movement of the cyclical component of different data series.

Data has been analyzed using the econometric software, Stata-14.

Empirical Result and Interpretation

As in finding out the relationship between the financial sector and real sector, it is an important aspect to capture the dynamism of relation between the financing and real GDP. For graphically capture the association between financing and real output, we are calculating the share of financing over GDP in different years.

Year Wise Contribution of Financing in GDP

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[1] Market capitalization refers to the total dollar market value of a company's outstanding shares of stock. It is calculated by multiplying the total number of a company's outstanding shares by the current market price of one share.

[2] Turnover gives the total value of shares traded in relation to the size of the market. It is the most important indicator of market activity (Mishra, 2012).
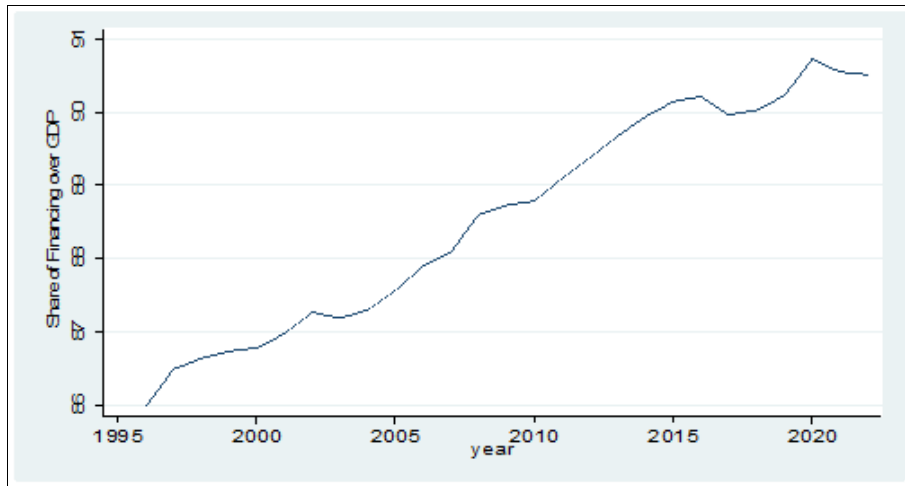
Fig 1: Share of Financing over GDP in Different Years

Note: Share of Financing over GDP

$$Share_{FG} = \left(Financing \Big/ GDP \right) * 100$$

Source: Ministry of Statistics and Programme Implementation, Government of India and Handbook of statistics on Indian Economy, RBI.

Figure 1 depicts yearly share of financing over GDP from year 1996 to 2022. The curve is moving upward shows there is a raising trend or the share of financing over GDP increases gradually in the current years. From year 1996 to 2003 there is mild upward trend of this series but after 2003 there is a more upward movement of the series share of financing over GDP up to 2017. After liberalization policy and financial sector reforms in 1991; there observed sharper upward rising financing over GDP. This may due to not only foreign capital started to coming in to the domestic country as well as domestic financial sector also start to improve. After 2017 there is a downward movement of financing over GDP and then again it is started upward movement. It may be due to the pandemic effects, where financing over GDP started increases due to low level of real output production in case of Indian economy.

Any annual macroeconomic series is composed of three components; trend (T) cyclical (C) and irregular (I) component [3]. To see the relation of upswing and downswing movement of the GDP series with the financial series we have decomposed the series and extract the cyclical components of all the series by using filtering technique. After de-trending each series, we are getting the stationary cyclical series. Here Hodrick-Prescott (HP) filtering [4] technique is used for extracting the trend

components and building cyclical series from each series (Hodrick and Prescott, 1997) [4].
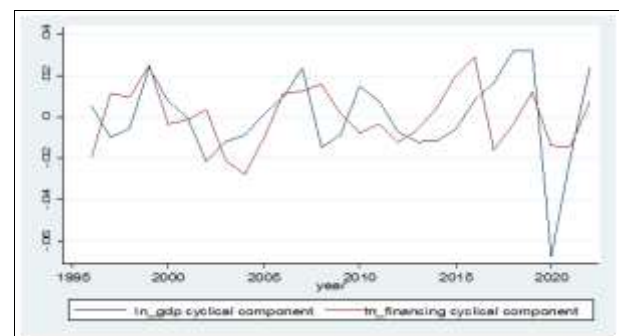
Source: Ministry of Statistics and Programme Implementation, Government of India and Handbook of statistics on Indian Economy, RBI.

Fig 2: Cyclical Series of Financing and GDP

From the above graph we can easily observed that there is more pro-cyclical movement between both the series of GDP and Financing. There is from 1998 to up to 2017 there is severe coincidence of cyclical movement between both the series of GDP and Financing. After 2017 there is huge anti-cyclical movement between the GDP series and Financing series.
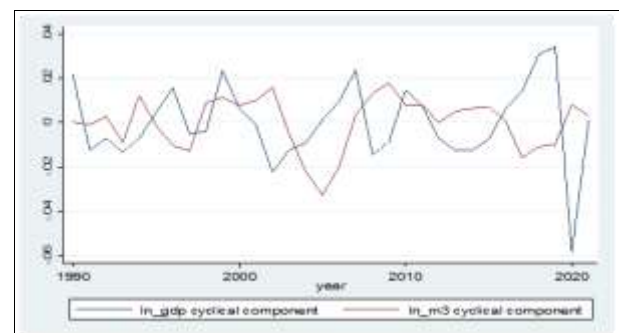

Fig 3: Cyclical Series of Broad Money and GDP

Source: Handbook of statistics on Indian Economy, RBI.
Figure 3 plotted cyclical movement of the broad money and GDP with respect to time from 1990 to 2021. Figure 3 shows that from year 1991 to 2008 pro-cyclical movement occurred between broad money and GDP series but from year 2009 to 2021 no coincidences occurred and even anti-

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[3] The trend component shows the permanent growth in the series due to structural factors like technological change or/and improvement in total resources in the economy. The cyclical component shows ups and downs in the economy due to temporary factors like demand side imbalances. And the random term shows some unpredictable events in the economy.
[4] HP filter remain one of the standard methods for de-trending. The filter involves smoothing parameter λ, which penalizes the acceleration in the trend relative to the business cycle component. Smoothing parameter λ = 6.25 is generally used for annual frequency data in the HP filter (Ravn and Uhlig (2002)).

cyclical movement observed between broad money and GDP series. It is shown that upward and downward swings in broad money are majorly observed to be associated with similar movements in GDP. Thus Indian GDP is more dependent on liquid liabilities expressed in terms of broad money (M3).

Now to find out the stationarity of series we have to perform the unit root test.

To find out the order of integration of the variables, we have used Augmented Dickey Fuller and Phillips Perron unit root test. From table 1 we are finding out that cyclical component of GDP series and cyclical component of Financing series both are level stationary. Test critical values in 1%, 5% and 10% level are given in the lower part of the table for both Augmented Dickey Fuller and Phillips Perron unit root test.

Table 1: Results of Unit Root Test of Annual Data Series of the Cyclical Series of GDP and Cyclical Series of Financing

Series	ADF statistics	PP statistics
GDP cycle	-4.35	-4.27
Financing cycle	-3.94	-3.96
Test critical values		
1% level	-3.74	-3.74
5% level	-2.99	-2.99
10% level	-2.63	-2.63

*Source***:** Ministry of Statistics and Programme Implementation, Government of India and Handbook of statistics on Indian Economy, RBI.

Table 2: Estimated Relation between GDP and Financing

Dependent variable	Independent variable	Coefficient value	t-statistics	p-value
GDP	Financing	0.75	102.81	0.00
	Constant	5.32	52.11	0.00

*Source***:** Ministry of Statistics and Programme Implementation, Government of India and Handbook of statistics on Indian Economy, RBI

Table 2 shows the estimated regression result between GDP and Financing where Financing significantly influencing the GDP. The value of the coefficient is 0.75. Thus 75% fluctuation in GDP can explain by Financing. Thus in case of Indian economy fluctuation in GDP may be highly influenced by Financing in different sectors.

To know the series are stationary or non-stationary we have to perform the unit root test. Augmented Dickey Fuller and Phillips Perron unit root test are the most prevalent unit root tests used in time series analysis to find out the order of integration of the series.

From the results of table 3 implies there is unit root for GDP, Market Capitalization, Turnover, WPI, Exchange Rate and Call Money Rate series in the level form and thus each series is non-stationary in level. But when the series are converted in first difference form their calculated coefficient values become less than the critical values in 1 percent, 5 percent and 10 percent level respectively implies stationarity of each series. However the calculated coefficient value of level series of Broad Money (M3) is less than the critical values in 1 percent, 5 percent and 10 percent level respectively imply stationarity of this series in level form.

Table 3: Results of Unit Root Test of GDP, Market Capitalization, Turnover, Broad Money (M3), WPI, Exchange Rate and Call Money Rate

Series Name	ADF Statistics
GDP	-0.23
Δ GDP	-4.97
Market Capitalization	-1.34
Δ Market Capitalization	-10.17
Turnover	-1.25
Δ Turnover	-5.51
M3	-4.54
WPI	-3.13
Δ WPI	-3.36
Exchange rate	-2.70
Δ Exchange rate	-9.15
Call money rate	-2.43
Δ Call money rate	-6.85
Test critical values	
1% level	-3.71
5% level	-2.98
10% level	-2.62

Source: Handbook of statistics on Indian Economy, RBI

To examine the existence of causality among variables we use Vector Autoregressive test or VAR test for analyzing the causality and the direction of causality among variables.

Table 4: Results of Vector Auto-Regression Model of GDP, Market Capitalization, Turnover, Broad Money (M3), WPI, Exchange Rate and Call Money Rate

Independent Variables	Dependent Variables						
	Δ GDP	Δ Market Capitalization	Δ Turnover	M3	Δ WPI	Δ Exchange rate	Δ Call money rate
Δ GDP	-.15	-.63	-15.17	0.05	-.57***	-.02	2.66
Δ Market Capitalization	0.09***	-.05	-.79	0.01	0.03***	-.02	0.48**
Δ Turnover	-.01	0.03	-.18	0.003**	0.01***	-.01	-.01
M3	0.34*	1.07	-1.25	1.62***	0.13	-.38	1.39
Δ WPI	0.81***	1.39	7.35	-.35**	0.47***	0.18	6.35**
Δ Exchange rate	0.14	1.93*	-9.18	0.04	-.17***	-.51	-.57
Δ Call money rate	.003	-.47**	0.19	-.02	-.01	0.02	-.44***

Note: *** implies significant in 1% level, ** implies significant in 5% level,* implies significant in 10% level and the rest are insignificant
Source: Handbook of statistics on Indian Economy, RBI

From the table 4 we found that market capitalization and money supply captured by broad money (M3) is significantly influencing the GDP of Indian economy. But Turnover is not significantly influencing the Gross Domestic Product in case of Indian economy. And WPI used as proxy of inflation rate also significantly influencing GDP. Exchange rate and call money rate also insignificant in this case. In case of market capitalization, it is only significantly influencing by exchange rate. For broad money (M3), turnover significantly positively and WPI significantly negatively influences broad money (M3), which is used as proxy of money supply. Whole sale price index used as proxy measure of inflation, is significantly negatively influenced by GDP and exchange rate and again significantly positively influenced by market capitalization and turnover. Call money rate which is used as proxy of interest rate is significantly positively influenced by market capitalization and WPI.

From this analysis we are getting that in case of Indian economy the causality goes only in one direction from financial sector to the real economy not the other way. As in most of the cases where financial sectors are less developed in an emerging country like India we are finding out existence of only one direction causal relationship. Only financial sector variables such as market capitalization and money supply influence the real economic indicator like total domestic production or GDP.

Concluding remarks

This study empirically investigates the causal relationship between financing and real output production. As we know from out of many studies that financial and real sector are interrelated. The causal relationship between the financial sector and real sector can go in both way directions from financial sector to real sector and again real sector to financial sector. For serving the purpose of determining the role of dependence between the financial economy and real economy, we can conclude that financial sector performance influences the real economy, mainly captured by growth, but real economic production is not influencing the financial sector performance in case of an emerging economy like India.

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