Financial Sector Development and Economic Growth in an Open Economy Framework: India's Experience

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Abstract

The nexus between financial sector development and economic growth in India was examined using quarterly data for the period from 1996QI-2011Q4. Gross domestic product was used as an indicator of economic growth and financial sector development was measured using aggregate deposits, market capitalization, exchange rate, and foreign investments. Gross fixed capital formation was also taken into the model to identify the relative significance of physical investments. With the dynamic relationship among the variables being captured by the vector autoregression model and the impulse response function, the results from the ordinary least square estimation revealed that financial reforms have supported economic growth.

Keywords: **financial sector development, economic growth, econometric modelling, vector auto regression (VAR) model**

JEL Classification: C51, C52, G20

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The nexus between financial development and economic growth has been a long-standing debate and is addressed by theoretical and empirical studies. However, the endogenous growth models have directed the attention towards the role of financial development in facilitating economic growth. A stable and an efficient financial system with sufficient size and higher degree of accessibility reckons up financial deepening and liquidity. With the history of Indian banking dating back to the 18th century, the regulation of the banking system came into place with the establishment of RBI in 1935. Since then, measures have been taken to strengthen the financial sector. The march from a closed economy since 1921 to an era of fully integrated economy highlights the growth of the financial sector.

The introduction of a series of reforms in the financial sector since 1990s have resulted in a market based banking system and a dynamic stock market. Introduction of a new policy regime, decrease in transaction costs, decrease in the currency to deposit ratio, and so forth have resulted in a bank based economy. Increase in the number of stock exchanges and market capitalization has increased the volume of stock market transactions. The increase in the size and liquidity of the capital market, increase in the credit-deposit of commercial banks, the rapid decline in the non-performing assets, and increase in the recovery percentage of the co-operative banks, and so forth has strengthened the functioning of the financial sector in the Indian scenario. The credit off take and deposits of the banking system went up by a CAGR of 19.9% and 18.2% from 2006-2011, respectively. The decline in the non-performing assets of the banking system from 1.02% in 2007 to 0.97% in 2011 highlights the improvement in their performance. The increase in the credit-deposit ratio of the commercial banks from 63.3% in 1980 to 78.6% in 2012, decrease in the loss making RRBs to 7 in 2010, increase in the deposits of the public banks and private banks by ₹ 2378785 crores and ₹ 450772 crores in the last 5 years respectively indicate the importance of the growing financial system.

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Efficient and effective functioning of a developed financial system is crucial for achieving a higher growth rate, but what goes beyond this is that what percentage of the population is a part of the growth that takes place. It becomes important to view financial inclusion as the progression of financial services.

Accumulated Wisdom

Various studies that form the literature framework concerning the nexus between financial development and economic growth date back to the major contributions made by the pioneers namely, Bagehot (1873), Schumpeter (1912), and Hicks (1969).

Schumpeter strongly put forth that financial development plays an important role in promoting growth. A well-functioning financial system would foster growth through the channel of technological innovation. Selection of the most promising projects and its financing by the financial system would help to realize the desired growth. Hicks (1969) and Bagehot (1873) supported the view that financial development, through the mobilization and allocation of funds for colossal works, had been an important channel in promoting industrialization in England. The works of Greenwood and Jovanovic (1990), Levine (1997), and Saint-Paul (1992) also added up to the literature supporting the role of financial development in promoting growth.

Greenwood and Jovanovic (1990) favored the role of financial development in aiding economic growth through its main objective of channelizing the resources towards high earning investment opportunities backed by the supply of information. The growth that takes place again would support the application of expensive financial structures. Levine (1997), in his model, explained that stock markets, by enhancing the efficiency of the firms, play an important role in speeding economic growth. Highlighting the role of a financial system in diversifying the risk by enabling the investors to acquire a diversified portfolio, Saint-Paul (1992) in his model brought out its positive impact in stimulating the business firms to specialize. As a result, the economy can experience productivity growth.

Obstfled (1994) explained that integration of the financial system would open up several avenues to approach the international financial markets and such openness would not only benefit the business activities, but also the economy. The implementation of new technologies often require a longer time for many industries. Such industries would benefit from the development of the financial market.

Levine and Zervos (1998) concluded that such financial system encourages higher savings, through efficient discharge of its functions, thus doing away with the evils associated with a low savings rate. The most important advantage flowing from such development is that it removes the difficulties that retard high economic growth. Supporting this view, Tsuru (2000) also highlighted the ability of a developed financial system in influencing economic growth through its effect on the savings rate.

To investigate the impact of reforms in the promotion of economic growth, Singh (2008) considered the period from 1951-52 to 1995-1996, focusing on the finance-growth relationship in India with a time-series method. Taking the financial ratios and new issue ratio as the measure of financial development, the maximum likelihood method was used to estimate the long run cointegration. The financial reforms since 1991 have significantly contributed to economic growth, and this is supported by empirical evidence using the impulse response and variance decomposition techniques.

Causality runs from financial development to economic growth only when there is enough inflow of capital. Taking the data for the period from 1970-2007 in case of India, the positive contribution of FDI in facilitating economic growth was supported by Pradhan (2010). With the existence of a long-run relationship coupled with bidirectional causality between economic growth and FDI, the paper pointed out the importance of financial deepening in drawing FDI and enhancing economic growth. Financial literacy is considered necessary for the foundation and success of financial inclusion.

Bihari (2011) used both primary and secondary data and employed weighted average, percentage analysis, and one way ANOVA by considering a sample of 150 respondents. With minimum percentage of the population depositing their surplus funds in the banks, it was found that a large percentage of the population was unaware of

the benefits attached to various accounts, credit and debit cards, locker facility, cheques, demand deposits, and overdraft advantages, and so forth. According to the study, with only 14% of the respondents believing in the efforts of banks to have had the desired results, the study accepted the hypothesis that the level of financial awareness of the respondents depended on the type of occupation in which they were engaged.

To find out the role of banks in facilitating credit, Chattopadhyay (2011) enquired into the extent of financial inclusion in West Bengal by computing an index of financial inclusion by taking into account the three dimensions - penetration, availability, and usage of the banking services stretching from 2006-07 to 2009-10. With no Southern states falling in the low level of financial inclusion, three North Eastern states fell in this category. Kerala stood first and West Bengal was placed at the 11th rank. Darjeeling district occupied the second place preceded by Kolkata district in the index value. Following a survey covering three districts with a sample size of 329 respondents, it was learned that around 38% of the sample strongly agreed with the fact that low levels of income prevented them from using the banking facilities. Introduction of SHGs, micro financing, and adoption of business correspondents will help to bring down the severity by catering to the demand side and supply side problems.

Data and Methodology

The study uses quarterly data for the period from 1996Q1-2011Q4. Economic growth was measured by GDP at factor cost at constant prices with 2004-05 as the base year. Aggregate deposits, market capitalization, exchange rate, and foreign investments were taken as the proxies for financial development. Gross fixed capital formation was taken to measure the physical capital. The data was collected from the Handbook of Statistics on Indian Economy obtained from RBI's website.

➲ **Economic Relationship :** AD (aggregate deposits) bears a positive relationship with GDP (gross domestic product). It is the source of credit. Banks do not keep the entire deposits in the form of cash.

$$GDP = f(AD,\ GFC,\ MCAP,\ FI,\ EXR)$$
$$(+)\quad (+)\quad (+)\quad (+)\ (-)$$

A large part of the deposits are released in the economy in the form of loans and investments. Higher level of credit delivery and higher investments would certainly show a positive result on the GDP. Gross capital formation is positively related to GDP. An increase in GFC (gross capital formation) causes an increase in GDP through the increase in physical capital stock. Capital formation is positively correlated to economic activity as it adds to the growth rate through the development of technology. GFC also influences GDP through the renewal of the productive system. The capital market shares a positive relationship with economic growth. MCAP (market capitalization) is as a proxy to stock market growth. Higher market capitalization leads to the reduction of both liquidity shock and productivity shock. It increases the confidence among businessmen in investment funds. High market capitalization improves the productive capacity of the economy. Higher market capitalization leads to higher economic growth. Foreign investment (FI) has a positive relation with economic growth, whereas exchange rate (EXR) has a negative relation with the GDP.

Empirical Analysis

This section empirically tries to verify the role of financial development captured by the variables: Aggregate deposits, investment, and market capitalization on economic growth measured by GDP.

➲ **Unit Root Test :** Before running the regression, stationarity of the variables was verified with the unit root test by employing the Augmented Dickey-Fuller test. A variable is said to be stationary when the estimated value is

Table 1. Unit Root with Trend and Intercept

Variable	At Levels	Inference	First Difference	Inference
LnGDP	-6.469204	Stationary	-	-
LnAD	-1.401669	Non-stationary	-7.561412	Stationary
LnGFC	-3.141005	Non-stationary	-10.50664	Stationary
LnMCAP	-2.125396	Non-stationary	-5.923025	Stationary
LnEXR	-2.424567	Non-stationary	-4.823459	Stationary
LnFI	-2.909586	Non-stationary	-4.659470	Stationary

less than the critical value at various significance levels. From the Table 1, it can be inferred that *LnGDP* (log gross domestic product) is stationary at levels, while *LnAD* (log aggregate deposits), *LnMCAP* (log market capitalization), *LnGFC* (log gross capital formation), *LnCMR* (log call money rate), *LnEXR* (log exchange rate), and *LnFI* (log foreign investments) are stationary at first difference.

➲ **Estimated Equation :** The model has a good R^2 of 0.69, indicating that the model explains around 70% of the variation in GDP. The D-W (Durbin Watson) statistic of 1.769075 signifies that the equation is free from the problem of autocorrelation. The overall strength of the model is given by the *F*-statistic (27.67316).

$$LnGDP = \underset{}{6.4296} + \underset{(3.06)}{8.4842}\ D(LnAD\ (-2)) + \underset{(2.26)}{0.6955}D(LnGFC(-2)) \underset{(2.44)}{}$$
$$+\underset{(6.03)}{0.5466}D(LnMCAP(-2)\ ) - \underset{(-2.68)}{0.0857}D(LnEXR) + \underset{(1.28)}{0.0819}D(LnFI) + 0.540160\ (DUM)$$
$$R^2 = 0.69 \quad D.W.\ Stat. = 1.76 \quad F\text{-}Stat. = 27.67$$

The most significant variable turns out to be market capitalization, followed by exchange rate, and then capital formation. The *t* - statistics given in the parentheses below the variables explain that aggregate deposits play an important role in influencing the growth rate. The estimated results show that 1% change in aggregate deposits causes 8.48% change in GDP. It influences GDP with a lag of two quarters. Deposits are transformed into credit. Steiner et al (1963) proposed the positive role of banks in influencing growth rate through the expansion and contraction of loans. Deposits acts as a main source for financing investments opportunities. Using the OLS (ordinary least squares) method, Tupe (2011) empirically verified the positive role of deposits on economic growth in India.

Significant change in GDP is caused by GFC. Around 0.69% change in GDP is caused by 1% change in GFC. It influences with a lag of three quarters. The direct impact of GFC on GDP is through the development of the physical capital stock. According to Plossner (1992), GFC also influences GDP in an indirect way by revolutionizing innovation . Our result that investment is significant in India is in line with a study depicting the high role of investment in the speedy growth rate of the Chinese economy (Knight & Ding, 2010). The results attained by Bhargaw and Raju (2012) also showed that GFC plays a major role in influencing the growth rate. Around 0.44% of positive variation in GDP is due to each percent change in market capitalization. It influences with a lag of two quarters. This is in line with the theoretical base.

Tobin (1969) suggested that high market value of the firm, as a result of high share prices, will lead to high investment, thereby leading to economic growth. Modigliani (1971) asserted that higher share prices leading to an increase in permanent income fosters higher economic growth. Theoretical proposition by Bernanke and Gertler (1989) and Kiyotaki and Moore (1997) stressed on the impact of stock prices on the firm's balance sheet- "financial accelerator". Given the existence of imperfect information in the credit market, a firm's competence to raise collateral loans increases with the increase in the share prices. With this being reflected in the balance sheet, availability of credit becomes possible, leading to higher investment, thereby causing economic growth.

Figure 1. In-Sample Forecasting

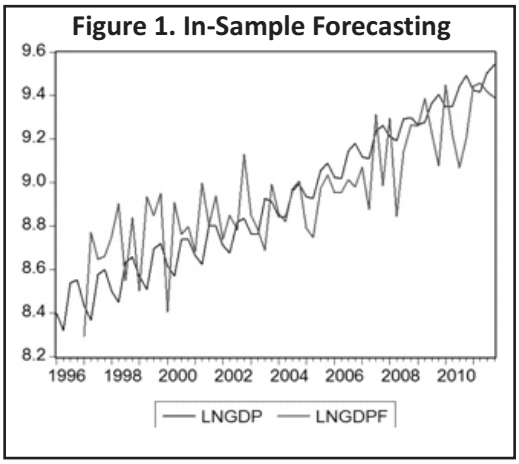
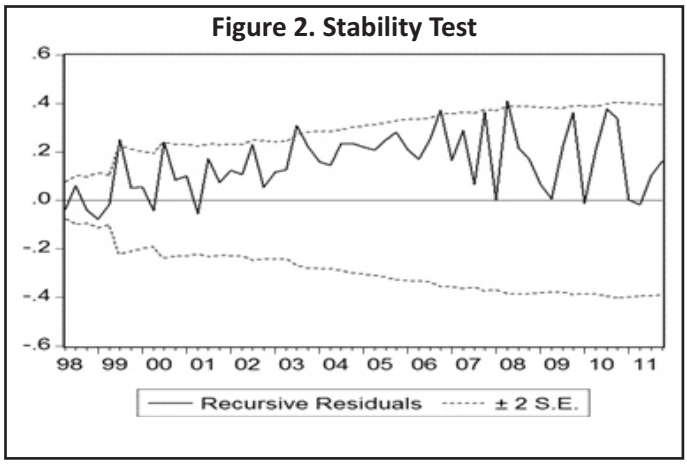


Figure 2. Stability Test



➲ **In-Sample Forecasting :** The Root Mean Square Error (RMSE) and Theil Inequality Coefficient (TIC) give the predictive performance of the estimated series. For a forecast to be good, the RMSE must be less than 3% and TIC should be less than 1%. The behaviour of the forecasted GDP is almost the same as the actual behaviour of GDP. This is indicated by the value of TIC (0.010494) and the value of RMSE (0.188014). The Figure 1 shows that until 2004, the model is overestimating and underestimates the actual series beyond the same period.

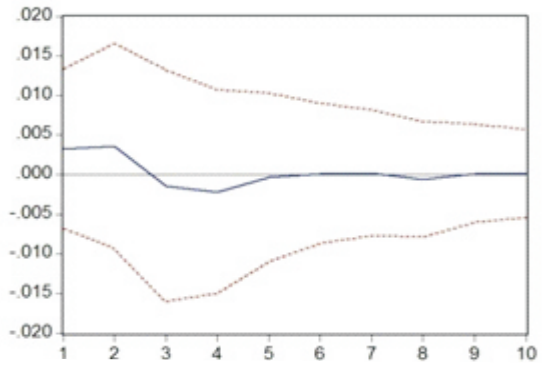
➲ **Stability Test :** We checked for the stability of the parameters using the recursive residual test. If the recursive residuals fall outside the standard error band, then the parameters may not have a long-run relationship. The Figure 2 shows that the estimated parameters are considered to be stable since the recursive residuals do not poke outside the standard error band, except for one or two periods.

➲ **Vector Autoregression (VAR) Model :** In order to understand the interdependence, the most exogenous variable is taken first followed by variables with less exogenity. From the Table 2, it can be seen that MCAP is influenced by the first lags of EXR and FI. The second lag of GDP also influences MCAP. Aggregate deposits are influenced by the second lag of GDP and the first lag of aggregate deposits itself. GDP is influenced by the lags of all variables except MCAP. The first and the second lags of aggregate deposits, GDP, and capital formation influence GDP. Gross capital formation is influenced by the lag of all the variables. The first lags of MCAP and GFC influence GFC, whereas the first and the second lags of aggregate deposits and GDP influence GFC. It is seen that the lag of all the variables except CMR influences itself. EXR is influenced by most of the variables and also, EXR explains most of the variables. FI is influenced by all the variables except AD, and FI explains all the variables.

Table 2. Dynamics of Interdependence

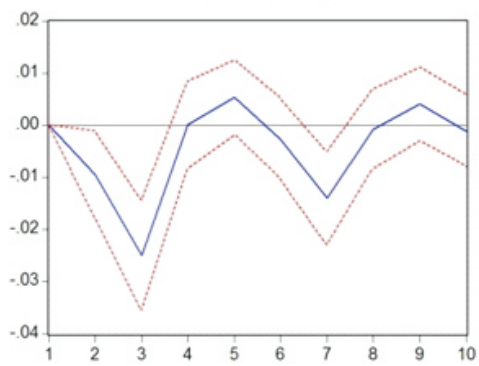
Variables	DLnMCAP	DLnAD	LnGDP	DLnGFC	DLnEXR	DLnFI
DLnMCAP	1	-	-	1	1,2	1,2
DlnAD	-	1	1,2	1,2	-	-
LnGDP	2	2	1,2	1,2	1	1,2
DLnGFC	-	-	1,2	1	1	1,2
DLnEXR	1	1,2	1	2	1	1,2
DLnFI	1,2	1	1	1,2	1	2

Figure 3. Response of GDP to MCAP



Source: Authors Calculation

Figure 4. Response of GDP to GFC



Source: Authors Calculation

➲ **Impulse Response Function :** The impulse response function gives the i^{th} period response when the system is given a shock of one standard deviation. A shock to a variable *('z')* will impact the z^{th} variable directly, but this shock will also be channeled to the independent variables.

As can be inferred from the Figure 3, a positive shock to MCAP increases GDP, but then it falls after the second period and then fitters out from the fifth period onwards. One standard deviation shock to MCAP does not generate more variation in GDP. The Figure 4 shows the response of GDP to a positive shock to investment. GDP decreases until the third period, and then from that period onwards, it starts to increase. GDP increases when there is a higher level of investment. Given a positive shock to GFC, it takes a lag of three periods for GDP to increase. It fitters out in the later periods. Higher aggregate deposits create higher level of economic activity. As can be inferred from the Figure 5, a positive shock to aggregate deposits leads to an increase in the GDP, but it falls after the second period and then again increases from the fourth period onwards.

Stabilization of the fluctuation takes a long time, making it possible for GDP to achieve equilibrium in the later periods. As the currency depreciates, the economic growth lowers, this is because as the currency depreciates, inflation rises, exports fall, and imports rise. This is reflected in the Figure 6, where the GDP falls after two lag periods. It fitters out in the 10th period. The Figure 7 depicts that as foreign investment increases in the economy, the domestic economic growth increases, but this happens after a lag. When foreign direct investments and portfolio investments increase, the domestic GDP rises, this is because of a lot of positive externalities of the flows.

Figure 5. Response of GDP to AD

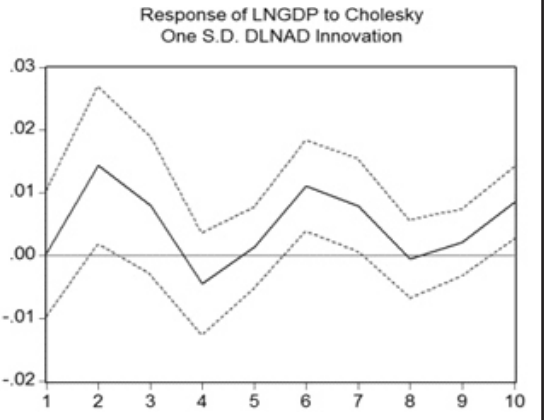
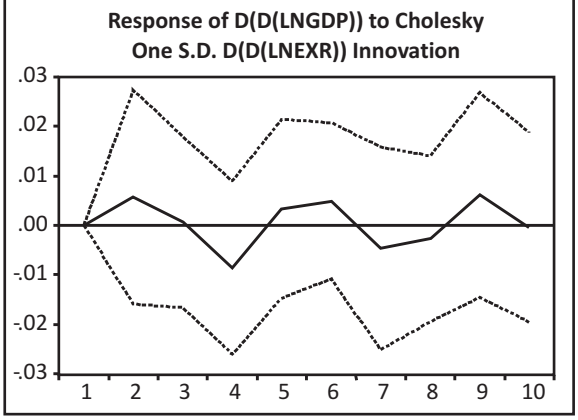
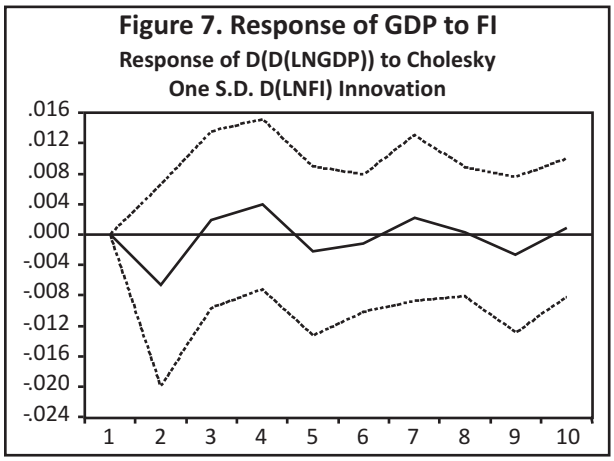


Figure 6. Response of GDP to EXR





Policy Implications

Efficient and effective functioning of a developed financial system in order to achieve a higher growth rate is important, but what goes beyond this is that what percentage of the population is a part of the growth that takes place. It becomes important to view financial inclusion as the progression of financial services. Economic growth following financial development becomes more fruitful if the financially unserved population is brought in the fold of the growth process. Sustainable growth, which has been highlighted in all the recent economic plans, will become possible with the success of financial inclusion. With the increase in credit demand, mobilization of savings by the banks and extending the same to the financially excluded becomes very significant. In recent times, financial inclusion has received intense attention in every forum, as inclusion fosters financial deepening, thereby equipping the banks with resources facilitating better credit delivery. With around 40% of the total population falling in the below poverty line category, it often becomes tough to relate financial inclusion with the increase in the number of bank accounts. Increase in the number of no-frills account does not make any sense in the Indian scenario, where the per capita income of people still remains very low. Thus, the role of the government stands crucial in promoting poverty alleviation programmes. Enhancing the standard of living of the people makes financial inclusion more concrete. Such a kind of financial inclusion triggers higher degree of financial development and hence, higher economic growth.

Conclusion

The present study, using quarterly data from 1996QI-2011Q4, probes into the linkage between financial development and economic growth in an open economy framework in India in the post reform period. With the aim to diagnose the direction of causality between financial development and economic growth and to look into the policy implications, we employed various econometric techniques.

The OLS results show that aggregate deposits, gross fixed capital formation, market capitalization, and foreign investments have a positive relationship with GDP, whereas exchange rate has a negative relation . The positive variation in GDP is explained highly by aggregate deposits (AD) and is well supported by the works of Steiner et al (1963). GFC plays an important role in enhancing growth. Its role in promoting high growth rate is channeled through the increase in the physical capital stock and development of technology. The positive role of market capitalization in influencing growth is well supported by the theoretical base. This relationship is found to have a long run relationship as indicated by the cointegration test. The dynamic relationship among the variables is understood using the VAR model. Our result - that financial development leads to economic growth -is supported by the results obtained by Schumpeter (1912), Levine (1997), and Levine and Zervos (1998).

The government must direct its policies towards strengthening the financial sector. Sustainable growth becomes possible with the success of financial inclusion. Focus should be on the enhancement of the standard of living of the people, rather than embarking on no frill accounts as a progression of financial inclusion. Financial inclusion triggers higher degree of financial development, and hence, higher economic growth.

Limitations of the Study and Scope for Further Research

The study did not consider extensive and better quality of financial indicators. With more extensive and better quality indicators, the role of financial development in economic growth could have been studied in greater depth, thereby bringing out the importance of financial inclusion. The incorporation of market structure, interest rate spreads, accounting practices, capital and liquidity management, market capitalizations, regulatory frameworks, and so forth could have made the study on the development of the banking sector more impactful.

In the present study, the finance - economics nexus is examined using limited variables. The same can be made more dynamic by adding the effects of the banking system and volatility of the stock market. Since the government plays an important role in the economy, its role as a saver and investor would help boost the economic growth through infrastructure development and capital stocks. The incorporation of such organization would bring out productive conclusions. The nexus can be more understood by incorporating the relationship between the domestic and international financial markets. The importance of foreign financial institutions cannot be ignored. It plays an influential role in the development of the domestic financial system. There also lies the scope to study how the financial system can be developed to benefit the economy. Cross country analysis along with individual country analysis would further extend the scope of the present study.

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