

A Study of Financial Development in India: A Comprehensive Approach

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Abstract

Financial sector development is one of the crucial requirements for the economic growth and development of a country. The financial sector is multifaceted in nature with several dimensions to its development be it in terms of access to finance, depth of the financial sector vis-à-vis the real economy, efficiency with which financial services are provided, and its resilience in times of crisis. This forms a 4 x 2 conceptual framework of financial sector development comprising four dimensions, namely, access, depth, efficiency and stability across two components of the sector, viz., financial institutions and financial markets, developed by the World Bank. Each dimension of financial development comprises a vast array of indicators. India made concerted efforts to liberalize its financial sector along with the economic reforms introduced in 1991. While financial development of India has been captured by several studies as in the case of cross-country comparison studies or in India-specific studies, most of the research work is with reference to a single year for country-comparisons or extend to a few years. No study is found that traces the long term development of the financial sector of India encompassing its varying dimensions. With this premise, the present study proposed an Index for a comprehensive measurement of the financial sector development in India over a long period. The Index of Financial Development (IFD) was constructed to measure the overall development of the financial sector by creating a pyramid structure of primary, secondary, and tertiary level indices. The study used the dimensions of both financial institutions as well as financial markets for inclusion in the index. The index was constructed for a 20-year period from 2001-2020, based on the availability of data. The indices showed continuous improvement in financial development and was found to be positively associated with economic growth.

Keywords: Financial Development, Financial Institutions and Market, Financial Access, Financial Depth, Financial Efficiency

1. Introduction

Financial development is one of the most crucial facilitating factors for the economic development of a country. It is defined as “the process of improving and expanding a country’s financial system, institutions, and markets. It involves the growth and sophistication of financial intermediaries, such as banks, insurance companies, stock markets, and other financial institutions, as well as the development of regulatory frameworks and infrastructure” (World Bank).

Financial sector development occurs when there is an overall growth in its multiple dimensions. The World Bank database of the global financial development is based on a conceptual framework of 4x2 dimensions of financial development developed by it. It encompasses four aspects of financial development, namely, access, depth, efficiency and stability across two components of financial sector, viz., financial institutions and financial markets. The 4x2 framework provides several alternative measures by which financial deepening and access, and efficiency and stability of the sector can be captured. In other words, the framework seeks not just to measure the breadth and depth of the financial sector but also if it is achieved in cost-effective ways. However, this very intricate nature of what constitutes financial development makes it difficult to be gauged unless the indicators of these dimensions are combined in a manner that is not only comprehensible but also lends itself to measurement.

In the above context, the present study has proposed an Index for a comprehensive measurement of the financial sector development. The purpose of constructing the Index of Financial Development (IFD) is that individual indicators of different dimensions are not sufficient to capture the level of financial sector development. The trends in the individual indicators over a long time are not easy to comprehend. Therefore, a measure is required that pools all these indicators into sub-indices of dimensions and which can then be further woven into the overall level of financial sector development. Such an approach would also help in identifying the weak links in sector development (Svirydzenka, 2016).

2. Review of Literature

In the area of financial development, majority of the studies found in the literature are centred around one primary dimension of financial development, financial access. Fewer studies are found on other dimensions of financial development which include financial depth, efficiency and stability. There are several studies in the area of financial sector development which undertake country comparisons. Most of these studies have grouped countries into different categories of developing countries, be it Asia, Africa, Latin America and the Middle East, as found in the data sources. More studies are concentrated on developing countries than developed countries as financial development is a matter of more relevant concern to them.

Country comparison studies on financial development include Beck, Kunt and Peria (2005), Claessens (2006), Beck and Kunt (2008), Sarma and Pais (2008), Beck, Kunt and Honohan (2008), Sarma (2008), Hannig and Jansen (2010), Rojas-Suarez (2010), Ardic, Hiemann, and Mylenko (2011), Sarma (2012) Rupeika (2014), Amidžić, Massara, and Mialou (2014), Ozili (2018). The studies cover a wide range of countries which are compared on various dimensions of financial development such as access, financial inclusion and usage, both among households and firms. To capture these dimensions of financial development, these studies have used alternative measures of geographical and demographic penetration such as number of bank branches and ATMs and number of deposit and loan accounts with banks, etc., over some number of population. Some of these studies also differentiate between household accounts and those of business firms, particularly, small firms. Average size of credit and deposits as a ratio to per capita GDP has also been employed to represent extent of usage of banking services across the countries compared.

Most of these studies have employed correlation and regression analysis between the dimensions of bank penetration, availability and usage. Some studies have employed factor analysis method to identify the more important ones among the alternative factors on the basis of which they are assigned weights. A few studies establish interlinkages between the various dimensions of financial development. These include

De la Torre, Ize, and Schmukler (2011), Mehrotra and Yetman (2015), García and Jose (2016) and Neaime and Gaysset (2018), using techniques like correlation and regression analysis and structural equation modelling approach.

Most studies with reference to gauging the extent of financial development in India are country studies which focus on a single year of comparison or very limited number of years for vast array of country comparisons. They include Bonin, Hasan and Watchel (2004), Beck, Kunt and Peria (2005), Darrat (2006), Claessens (2006), Mohan (2006), Yuncu (2007), Sarma (2008), Ahmad and Malik (2009), Hannig and Jansen (2010), Rojas-Suarez (2010), Ardic, Hiemann, and Mylenko (2011), Akgun Unaldi (2011), Arora (2014), Amidžić, Massara, and Mialou (2014), Aggarwal (2014), Sharma (2016), Prasad (2017), etc. These studies are centered around limited dimensions of financial development such as access, inclusion and depth. There is no study found that examines the financial sector development in India in its entirety, and for a long period of time.

Studies with broader approach to the measurement of financial sector development can be traced to Cihak, Kunt, Feyen, and Levine (2012) Lenka (2015), Svirydzenka (2016), Ito and Kawai (2018), etc., mostly in the form of construction of financial sector indices.

Lenka (2015) proposed a financial depth index as a proxy variable to measure the financial development of India. The study has constructed two separate indices covering different time periods by using time series data from 1980 to 2011 and another from 1990 to 2011. The first index uses eleven indicators, namely, private sector credit to GDP, central bank asset to GDP, total asset to GDP, liquid liabilities to GDP, M₂ to GDP, deposit to GDP, remittance inflow to GDP, total reserve to GDP, etc. The second index includes more four indicators related to financial market, namely, outstanding domestic private debt securities to GDP, outstanding public debt securities to GDP, stock market capitalization to GDP, stock market total value traded to GDP. The study compares the financial development of a country with its economic growth. Results show that financial development is an important factor in the economic growth of a country.

Svirydzenka (2016) has constructed an index to measure Financial Sector development for 183 countries using the annual frequency data collected by the World Bank for the year between 1980 to 2013. The study includes only the key features of financial system such as accessibility, size and efficiency of financial sector. It constructs two sub-indices using 20 dimensions amongst which twelve dimensions are related to financial institutions and the remaining eight dimensions with reference to financial market. To construct the index related to financial institutions three indices are constructed representing three dimensions, namely, access, depth and efficiency. The other set of sub-indices is constructed to obtain the composite index for the financial market. The study has used principal component analysis to assign weights to the dimensions at different stages. It concludes that there is progressively overall growth in the financial development of advanced and emerging economies, and comparatively lesser growth in the lower income countries.

Ito and Kawai (2018) have measured the development of financial markets through the construction of two composite indices by using quantity and quality aspects of financial development. The index is constructed for different numbers of countries ranging between 49 to 193, depending upon the availability of data over different periods of time from 1975 to 2015. The first composite quality index is constructed using dimensions namely, market diversity, market liquidity, market efficiency, institutional environment, legal and institutional development, human capital development, and information and telecommunication infrastructure development. The second index, which is a composite index of quantitative aspect of

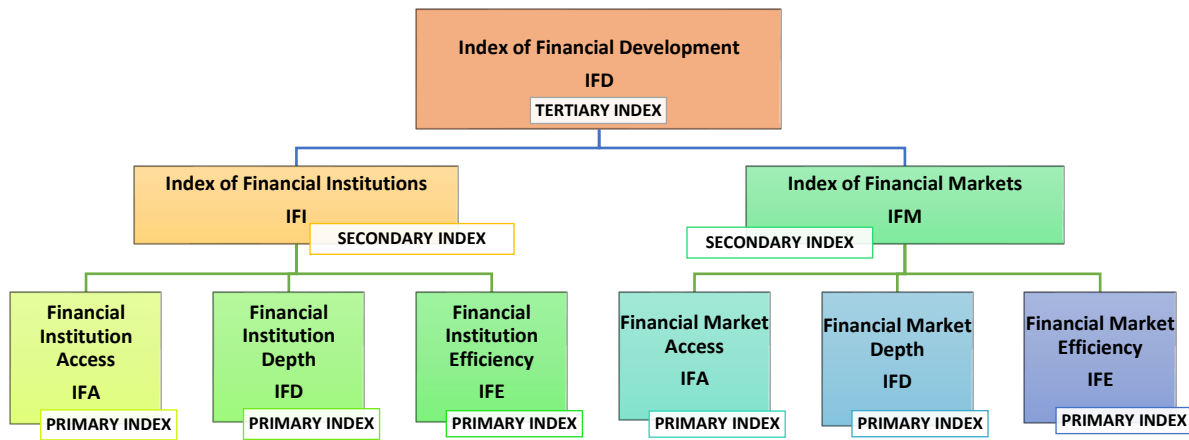
financial development, includes indicators of size and depth of financial sector typically found in the related literature. Simple regression and correlation is carried out for both, quality and quantity index of financial development. It concludes that there is a high degree of correlation between the quality and quantity index of advanced and Asian emerging economies. The result of regression analysis shows that the quality measurement had a positive effect on output growth and negative effect on output volatility for developing and emerging economies with a high level of financial development.

Gupta and Mahakud (2019) extend the inquiry by using the index developed by Svirydzenka (2016) to construct an index of financial development for India. The study uses all the dimensions found in Svirydzenka (2016) and adds the fourth indicator of financial development, namely, stability. The dimensions used to measure the stability are bank Z-score, non-performing loans to total loans, bank credit to bank deposit, capital to risk weighted asset for financial institutions and stock price volatility for the financial market. The study uses Generalised methods of moments to estimate the effect of financial development on the investment cash flow. The results show that financial development reduces the sensitivity of investment cash flows.

Financial development for a developing country like India is about establishing the fundamental blocks of the financial sector in terms of improving its breadth and depth as also achieving this with efficiency and stability. Unless the financial sector achieves a reasonable degree of width and depth, any large private capital inflows or those induced by government or central bank efforts may result into distorted allocation of finance. It implies, therefore, that broader and deeper financial sector have an important bearing on the efficiency of the sector.

The present study proposes a financial development index as a comprehensive measure of financial development. The construction of the Index of Financial Development (IFD) is drawn from Lenka (2015), Svirydzenka (2016), and Gupta and Mahkud (2019). The IFD measures the overall development of the financial sector by creating a pyramid structure of primary, secondary and tertiary level indices (Figure 1). The primary indices comprise six-dimensional indices of access, depth and efficiency, three of which are related to financial institutions and three to financial markets. The two sets of the three dimensions aggregate to build two secondary indices. These secondary indices are the Index of Financial Institutional (IFI) and Index of Financial Markets (IFM). Finally, the tertiary index, namely, the IFD is constructed as a composite index of the two secondary indices. The index has been constructed for a 20-year period from 2001-2020, based on availability of data. It may be noted that the dimension of financial stability is not included in the construct of IFD. This is because stability differs from the first three dimensions, in the sense that it is more of a combined outcome of a host of micro and macro level institutional, regulatory and legal factors. Moreover, stability of the financial sector is also impacted by interconnections between financial institutions and markets, both, domestic and global. The construct of IFD presented below is drawn from Svirydzenka (2016).

Figure 1: Pyramid Structure of Financial Development



3. METHODOLOGY TO CONSTRUCT INDEX OF FINANCIAL DEVELOPMENT

The index at each level is constructed using three steps, (i) normalizing the data (ii) assigning weights to each variable and (iii) working out the weighted average.

Step 1: Normalization of data

$$D_x = \frac{x - x_{min}}{x_{max} - x_{min}} \quad (1)$$

where,

x = actual value

x_{min} = minimum value

x_{max} = maximum value

D_x = normalised value

In the case of some of the variables of the efficiency, lower values imply greater efficiency. These include net interest margin, total expense to deposit, and bank overhead cost to total assets. For such variables, formula (1) would give misleading results. Therefore, (1) is modified to reverse the range of normalized value as shown in (2). The reverse normalized formula gives a higher value to a lower figure and a lower value to a higher figure. The normalized value will bring all the variables within the range of 0 to 1.

Reverse normalized formula:
$$D_x = 1 - \frac{x - x_{min}}{x_{max} - x_{min}} \quad (2)$$

Step 2: Assigning Weights

It is important to assign weights to the indicators in order to construct the index. The technique of principal component analysis (PCA) has been employed to identify the significant indicators for the primary indices. Similar approach is found in Lenka (2015). The PCA technique helps extract the indicators by identifying those that have the highest possible variance to account for the variation in the variable of interest, and accordingly assigns them weights. In the present study, the indicators whose factor loading is above one percent are chosen for inclusion in the construction of the index.

Step 3: Computing Weighted Averages

The index is constructed as a weighted average of the variables, that is, all the variables are assigned weights and aggregated to generate the value of the index.

$$I = \sum D_i * W_i \tag{3}$$

All the three steps are followed at each of the levels, primary, secondary and tertiary, to construct the relevant indices, that is, the six sub-indices of dimensions, two indices for financial institutions and financial markets and one final index of financial sector development.

To construct the secondary level indices, all the six primary indices are renormalized and assigned weights to obtain the IFI and IFM.

$$IFI = \sum_3^n FI * W_i \tag{4}$$

$$IFM = \sum_3^n FM * W_i \tag{5}$$

The tertiary index is a composite index of all the dimensions constructed through the weighted average of the secondary index. All the steps are applied again to get the value of the final index. The final index value is arrived using the formula (6). W_I represents the weight assigned to the secondary index, the Index of Financial Institution, and W_M represents the weight assigned to the other secondary index, the Index of Financial Markets.

$$IFD = W_I * IFI + W_M * IFM \tag{6}$$

The present study has used 21 different indicators to construct the primary indices as shown in Table 1. Having identified the indicators and their weights, the primary indices, IFA, IFD and IFE are constructed following the steps of construction. The secondary indices, IFI and IFM are constructed following the same technique of PCA in order to find the weightage for the primary indices of access, depth and efficiency. The values of the primary indices are first renormalized and then assigned weights to derive the secondary indices. The weights applicable to the primary and secondary indices are presented in Table 2. The primary indices and the IFI based on them are depicted in Figure 2.

Table 1: Indicators used in the Construction of the Index of Financial Development and Weights Assigned

Dimensions	Financial Institutions Indicators	Weights (PCA)	Financial Markets Indicators	Weights (PCA)
Access	No. of bank deposit accounts per 1000 adult population	0.95	Market capitalization per 1000 adult population	0.69
	No. of bank credit accounts per 1000 adult population	0.03	No. of listed companies per 100,000 population	0.18
	No. of deposit accounts of post office per 1000 adult population	0.02	Value traded excluding top 10 traded companies to total value traded	0.09
			Market capitalization excluding top 10 traded companies to total market capitalization	0.04
Depth	M3 to GDP	0.75	Stock market capitalization to GDP	0.53

	Bank deposit to GDP	0.14	Stock market total value traded to GDP	0.31
	Bank credit to GDP	0.09	Outstanding domestic public debt securities to GDP	0.11
	Bank assets to GDP	0.02	Corporate bond issuance to GDP	0.06
Efficiency	Net interest margin	0.37	Stock turnover ratio	1.00
	Interest expense to deposit	0.31		
	Non interest to total income	0.19		
	Total income to operating expense	0.09		
	Return on equity	0.03		

Table 2: Weights assigned to Primary Indices based on PCA

Primary Index	Financial Institutions	Financial Markets
	Weights	Weights
IFA	0.65	0.64
IFD	0.33	0.22
IFE	0.02	0.14
Secondary Index	-	-
IFI	0.91	-
IFM	-	0.09

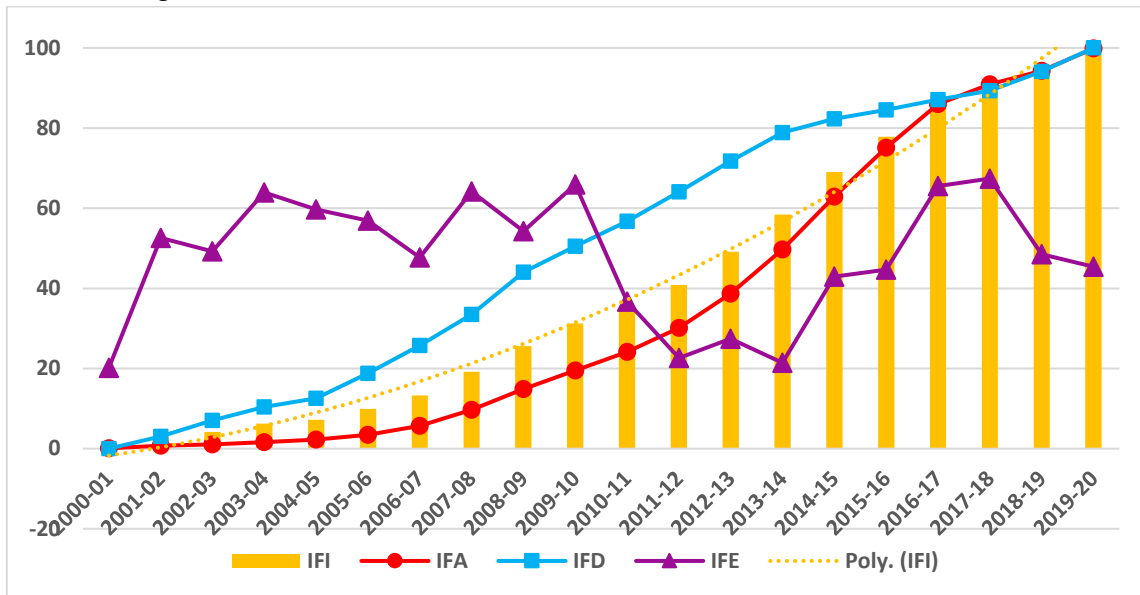
Source: Weights obtained from PCA Technique

4. Analysis and Interpretation

Figure 2 shows the primary indices of access, depth and efficiency related to Financial Institutions. The index of financial access (IFA) has improved remarkably at a high CAGR of 44 percent. From a very low value of 0.09 percent at the beginning of the analysis period, the index has increased to 99.48 percent in the last year of the analysis period. The index of financial depth (IFD) has also grown at the robust rate of 21 percent on compound annual basis. It can be seen that the graphs of both IFA and IFD begin at the bottom of the scale and reach up to 100, which indicates expansive improvement in both access and depth.

The institutional efficiency index (IFE) shows a mixed result with lot of fluctuations. No particular trend is observable in IFE as only some of its components have performed in the desirable manner, while some have not. The values of the index range between 20 and 67 percent. Particularly, after the impact of the global financial crisis was experienced on the Indian economy since 2008-09, followed by the period of great recession, the efficiency index has shown a declining trend over those years. After the impact of *taper tantrum* subsided, the index shows some improvement, peaking at 67 percent in the year 2017-18. The fall in the last two years may be attributed to the impact of NBFC crisis which greatly impacted bank lending activities and their margins. For the overall period, at the most it may be stated that the IFE has not worsened.

Figure 2: Dimensional Indices related to Financial Institutions and IFI



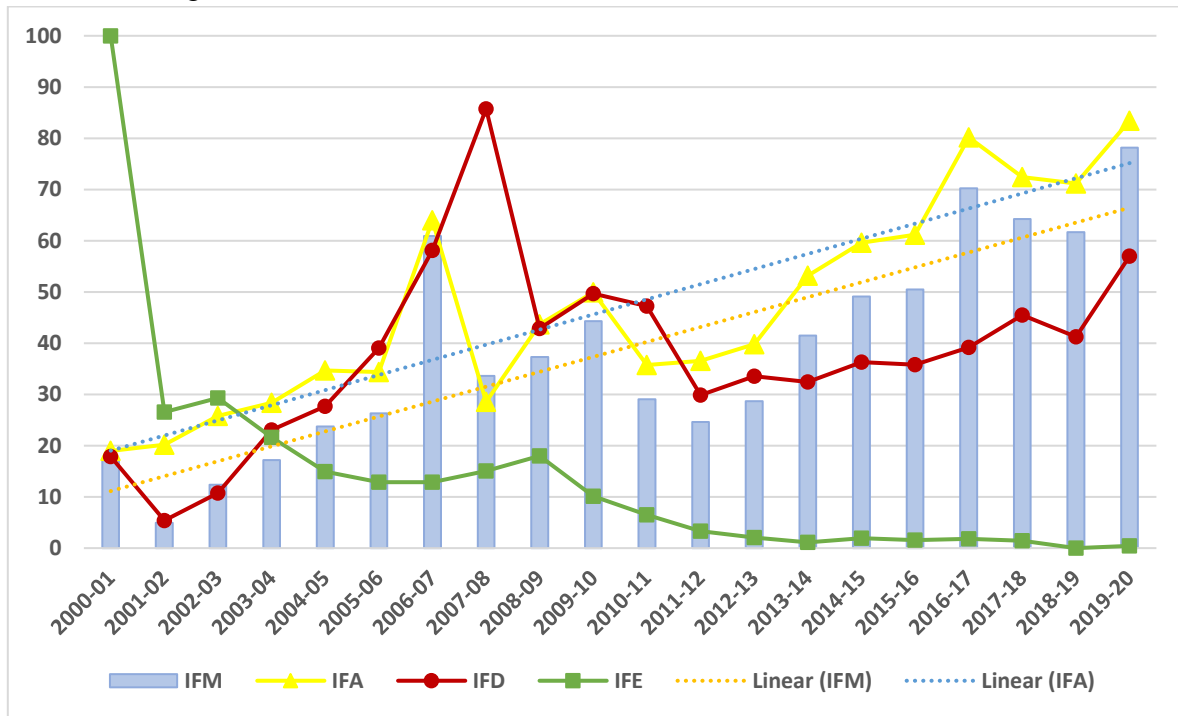
Source: Authors' Computations

The composite IFI shows a continuous improvement throughout the period, growing at the CAGR of nearly 22 percent. It may be noted from Table 3 that the maximum contribution to the IFI, to the extent of 65 percent has been on account of the improvement in bank penetration, followed by that of IFD at 33 percent.

Figure 3 depicts the same of sets of primary and secondary indices but with reference to financial markets. It can be seen that the primary index of access related to financial markets has an upward trend, growing at the CAGR of eight percent. Comparatively, the financial depth index has trended upwards with a gradual course and a CAGR of six percent. Also, its trend is much flatter from the year 2008-09 to 2018-19 over which the values have remained in the range of 41 and 42 percent. Only in the last year, 2019-20, it has increased to 56 percent.

The efficiency index related to financial markets has a negative trend, falling from its maximum value of 100 percent to nearly zero in the last years of the study period. It may be noted that in the present study, financial market efficiency is represented by only one indicator, the stock turnover ratio. The drastic fall in the second year of the analysis period may be attributed to the stock market scam which adversely affected the stock market trading.

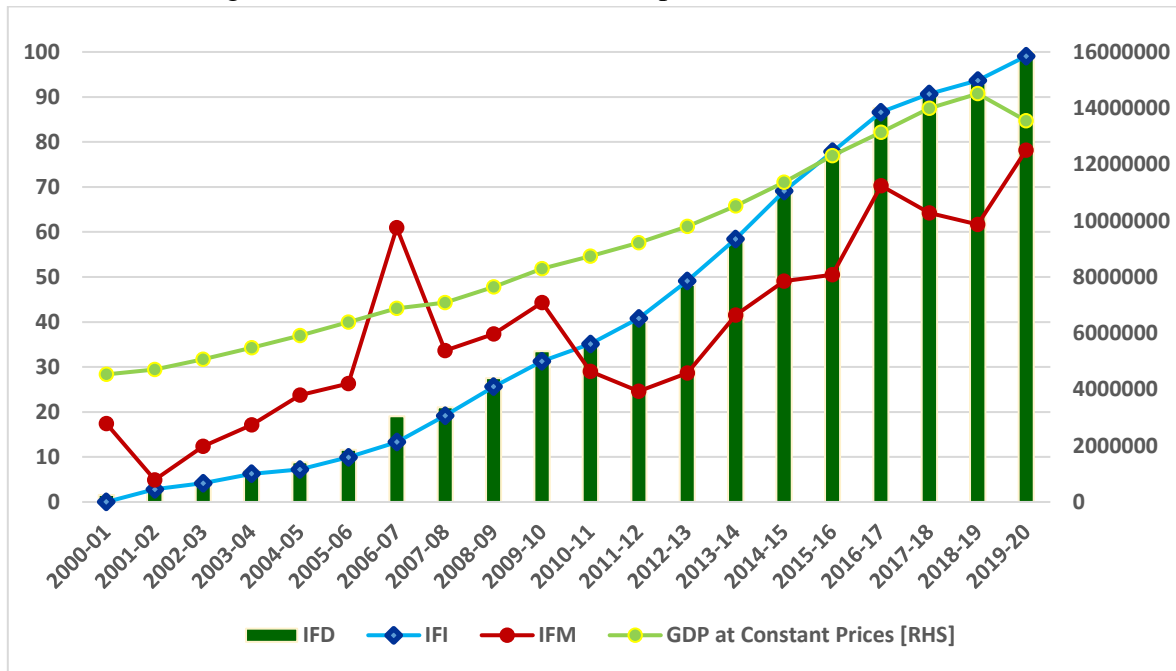
Figure 3: Dimensional Indices related to Financial Markets and IFM



Source: Authors' Computations

The overall results in terms of the composite index of the financial markets, IFM, shows reasonable improvement. Interestingly, the linear trend of the secondary level index, IFM, is parallel to the linear trend in the primary index of IFA, which implies that the access dimension has played an overpowering role compared to the other two primary indices, IFD and IFE, related to financial markets. This is also substantiated by the fact that the IFM has grown at the CAGR of eight percent just like the IFA. A closer look reveals that post global financial crises, the capital market in India became more well organized and highly equipped with technological advancement. This is evident in the fact that, for the six years preceding 2007-08, the IFA related to financial markets, grew at the CAGR of six percent, but in the next ten years since 2007-08, the financial access index has grown at the double CAGR of twelve percent. The final analysis in this section is related to the tertiary index of financial development, which is the composite index of the two secondary indices, IFI and IFM, depicted in Figure 4. Both the secondary indices show upward trend, with IFI having a continuously rising trend while the IFM rising with some fluctuations. The weights as obtained from the PCA technique are 0.91 for IFI and 0.9 for IFM. It implies that the institutional index plays a greater role in the financial sector development of India. In other words, banking and non-banking institutions still continue to play a more significant role in the Indian context compared to financial markets. In fact, it can be observed that the graph of IFI and IFD overlap each other at almost all points.

Figure 4: Index of Financial Development and GDP



Source: Authors' Computations, GDP data from HSIE, RBI

The index of financial development has grown at a robust CAGR of 24.59 percent during the period of analysis, which is commendable for the Indian economy. Figure 4 also shows the graph of GDP at constant prices for providing a perspective. It may be seen that financial development and economic growth are positively associated with each other.

5. Conclusion and Recommendation

The findings of the study show that there is an overall improvement in the financial sector in India in terms of the dimensions of access, depth and efficiency. The result shows that the institutional development has played a major role in the financial sector development of India. In other words, banking and non-banking institutions still continue to play a more significant role in the Indian context compared to financial markets. A greater number of the Indian population, across urban and rural areas, now have increased access to bank accounts and digital banking modes. This has greatly enhanced the pace of economic activities, both physical and electronic in nature. In the recent years, financial innovation has been witnessed in India with a large array of financial products and services being designed and developed to cater to varied needs. The Covid-19 pandemic also has been a catalyst in integrating banking services in the financial behaviour of households and businesses. These are important building blocks of financial development.

The findings suggest that the authorities need to build further on this strength by improving the institutional framework of the financial sector along with the legal, and regulatory framework in India to take the financial sector development to greater heights along with efficiency gains and systemic resilience. At the same time, there is a need of concentrated efforts on improving the facilitation and ease of procedures related to financial markets to improve its access for more people. Among other things, creating awareness and imparting financial literacy would go a long way in the dimensions of financial markets, in particular, with reference to India.

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