

CHAPTER 4

CONSTRUCTION OF FINANCIAL DEVELOPMENT INDEX OF BRICS COUNTRIES

4.1. Introduction

Measuring financial development of any economy is very challenging for researchers as financial sector of any economy is very vast and dynamic. Many researchers have used different proxies and methods for measuring the level of financial development of economies. At the same time, there is no universal measure of financial development. So, in this chapter, an attempt is made to measure the financial development of BRICS countries by constructing a financial development index of each BRICS country. An index is a statistical aggregate of a group of related variables which measures change in magnitude of those variables to measure their performance. In this study also, to measure financial sector development three variables of the financial sector are considered that significantly contribute to the financial development of a nation. As mentioned earlier in the study, variables considered for construction of financial development index are broad money as percentage of GDP, domestic credit to private sector as percentage of GDP and market capitalization as percentage of GDP. PCA approach is applied to obtain the weights of these variables to construct the financial development index. But before construction of financial development index, pictorial analysis of variables of financial development index and manufacturing exports of BRICS countries is done over the study period.

This chapter is divided in two major parts. In the first part, pictorial analysis of variables is presented with the help of line chart. And in second part, financial

development index of each BRICS country is constructed to measure the level of financial development.

4.2. Trend and Pattern of Financial Development Index Variables and Manufacturing Exports of BRICS Countries

In this section of the chapter, the first objective is covered which is to analyze the trend and pattern of variables used in the study. Trend and pattern of variables of financial development index and manufacturing exports of BRICS countries is analyzed in a sequential manner with the help of line chart. At first, the trend and pattern of financial development variables of BRICS countries is analyzed and next trend and pattern of manufacturers exports (% of merchandise exports) is captured.

4.2.1. Trend and Pattern of Financial Development Index Variables of Brazil.

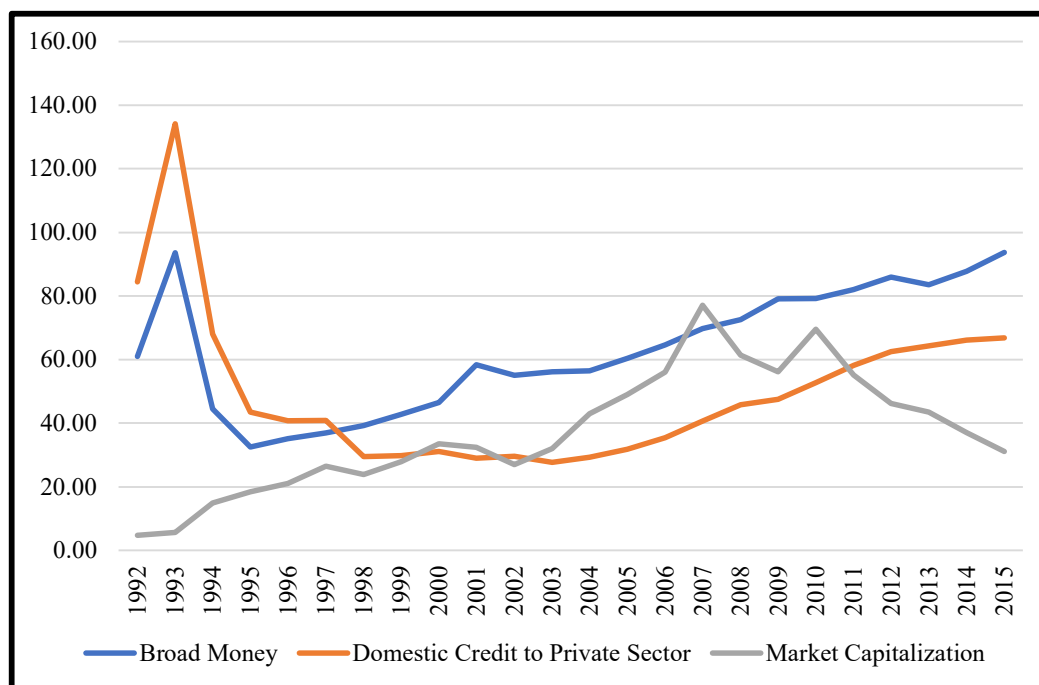


Figure 4.2.1.1: Financial Development Index Variables of Brazil (% of GDP).

In Figure 4.2.1.1 variables of financial development index of Brazil are plotted over the study period. In the line chart, years are on horizontal axis and value of variables are on vertical axis. During the study period, broad money and domestic credit to private sector of Brazil increased very rapidly for a few initial years and then had a rapid fall for the next few years till 1995. After 1995, broad money increased smoothly but domestic credit to private kept falling but at a slower rate. Domestic credit was 84.47 % of GDP (1992) and came down to 27.69% (2003) again after 2003 it increased up to 66.83% till 2015 (Tabular data is presented in Appendix A). A possible explanation for this decline in domestic credit to private sector is that in Brazil during this time banks had very limited experience in dealing with private sector (Moyo et al. 2018). At last, market capitalization of Brazil was 4.75% of GDP in 1992 and increased smoothly to 77% of GDP till 2007 but after 2007 due to sub-prime crises and political instability in Brazil it started to decline and came down to 31.11% in 2015. Brazil initiated many reforms after 1988 at regular intervals and because of those reforms, increasing and decreasing trend is reflected in these variables of Brazil during the study period.

4.2.2. Trend and Pattern of Financial Development Index Variables of Russia

In Figure 4.2.2.1 variables of financial development index of Russian economy are plotted. Broad money (BrM) has an increasing trend from 1993 to 2015 with little bit fluctuations. In 1993, it was 5.38% and became 61.60% at the end of study period (Tabular data is presented in Appendix B). Like BrM, domestic credit (DCP) also has an increasing trend during the study period. DCP was 0.01% in 1993 and become 56.43% in 2015. Lastly, market capitalization (MC) had a very fluctuating trend during whole study period. During 2007, MC attained a height of 100.83. After 2007,

it started to decline and came down to 24.14% till 2015 and the reason for this huge fall is global recession.

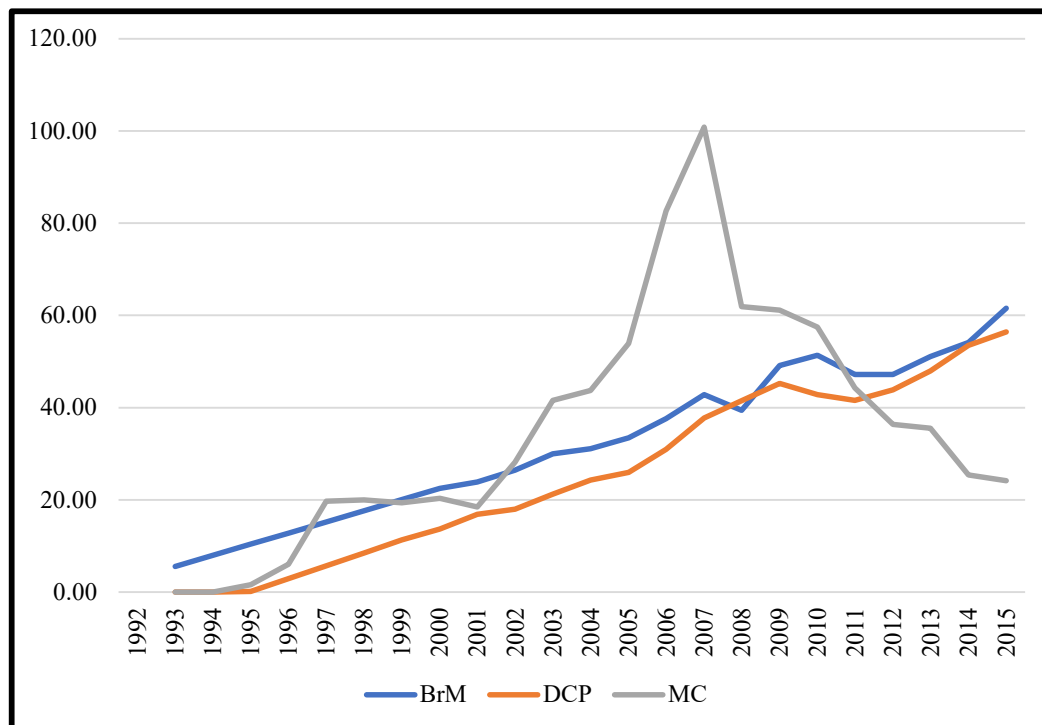


Figure 4.2.2.1: Financial Development Index Variables of Russia (% of GDP).

4.2.3. Trend and Pattern of Variables of Financial Development Index of India

In Figure 4.2.3.1 variables of financial development index of India are presented. Like Russian economy, BrM and DCP of India also have an increasing trend and MC has a fluctuating trend. In 1992, BrM of India was 44.74% and reached to 78.06% at the end of study period (Tabular data is presented in Appendix C). Some of the major reasons for this increase are increased deposits with banks, improved performance of many sectors and economic reforms of 1992. DCP was 25.03% in 1992 and reached at top (51.90%) in 2015. And the major reasons for this improvement are economic

reforms of 1992, financial inclusion policy which simplified the banking procedure which increased the reach of banking system. MC had a very volatile trend during the study period. The lowest and highest point of market capitalization are 18.78% in 1992 and 113.4% in 2007 respectively. But after 2007, it declined very rapidly because of global recession and reached to 58.78% in 2012. After 2012, it again started to improve and reached to 71.5%. Some of the major reasons for this increase in market capitalization of India are increased FIIs, mutual fund investments, mergers and acquisitions, increased financial literacy among investors, simplified trading and settlement procedure. On the other side, U.S sub-prime crises, high oil prices, slowdown of world economy have also impacted market capitalization of India negatively.

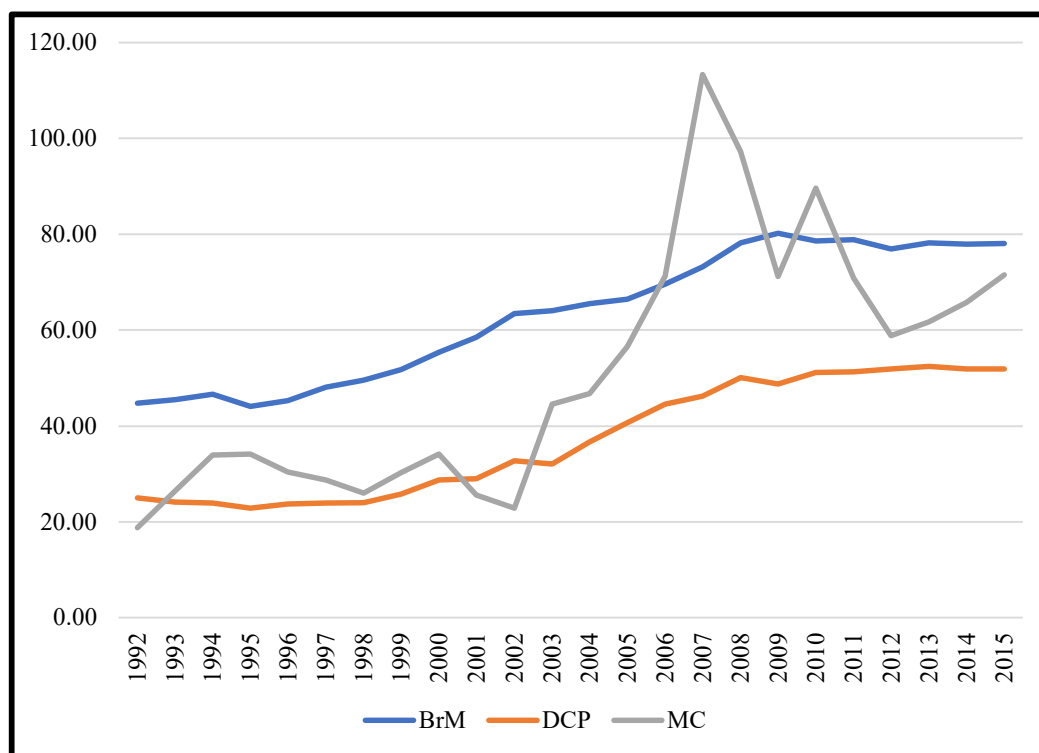


Figure 4.2.3.1: *Financial Development Index Variables of India (% of GDP).*

4.2.4. Trend and Pattern of Variables of Financial Development Index of China

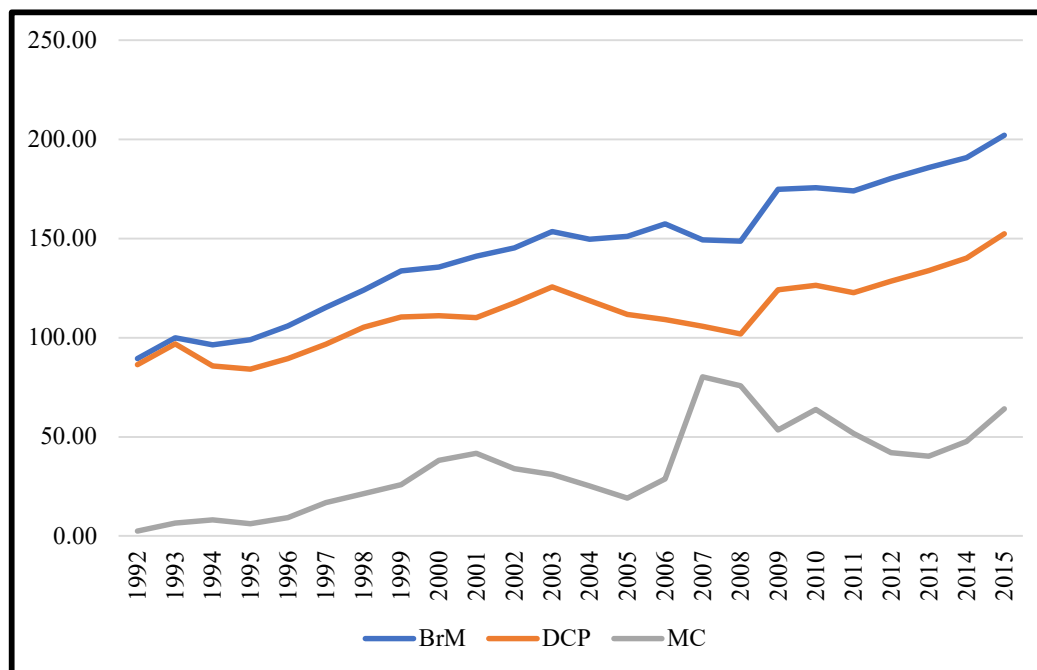


Figure 4.2.4.1: *Financial Development Index Variables of China (% of GDP).*

Figure 4.2.4.1 shows the trend and pattern of variables of financial development index of China. BrM and DCP of China have an increasing trend except for a little bit fluctuation around 2006. In 1992, BrM was 89.46 % of GDP and attained a height of 202.06% of GDP in 2015 (Tabular data is presented in Appendix D). DCP follows same pattern as of BrM. In 1992, DCP was 86.37% and at the end of the study period, it became 152.55%. This increase in DCP is witnessed because a lot of investment projects are going in China over the last 3 decades and entry of some foreign banks into the market (Allen & Qian et al. 2014). Like other BRICS economies, market capitalization (MC) has a fluctuating trend during the study period. In China Stock exchange came into existence in 1991 and since its establishment growth has been uneven and irregular. In 1992, it was 2.4% of GDP and at the end of study period, it

becomes 64.14 %. The highest and lowest market capitalization was 2.4% in 1992 and 80.14 % in 2007. China's stock market is not comparable with China's banking sector as it is not effective as the banking sector. (Allen & Qian et al. 2014).

4.2.5. Trend and Pattern of Variables of Financial Development Index of South Africa

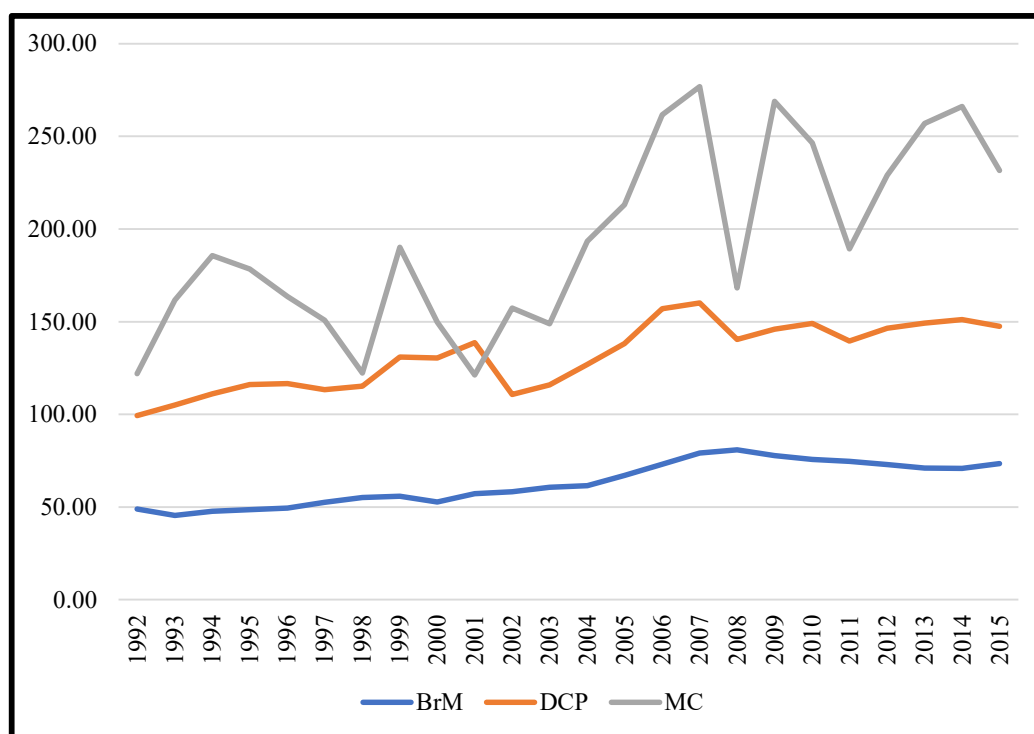


Figure 4.2.5.1: *Financial Development Index Variables of South Africa (% of GDP).*

In Figure 4.2.5.1 trend and pattern of variables of financial development index of South Africa are presented. BrM has a smooth increasing trend. It was 48.95% of GDP in 1992 and became 80.80 % of GDP in 2008 after that it declined to 73.44% till end the of the study period (Tabular data is presented in Appendix E). DCP and MC has a fluctuating trend over the study period. DCP was 99.38% of GDP in 1992 and increased to 138% till 2001. After 2001 it declined sharply to 110.72% till 2002. It

again attained height of 160% till 2007. It again declined after 2007 and at the end of the study period, it was 147.61%. MC was 2.4% of GDP in 1992 and follows a highly fluctuating pattern over the entire study period. This fluctuating pattern is unusually huge, it is only exceeded by Hong Kong and Singapore. Mining in South Africa is one of the main reasons for increase in domestic credit and market capitalization as mining required capital raising for large scale projects (Hassan M. 2013). Fast economic growth & development, political stability, increased regional collaboration also helped in development of stock market of South Africa (ACM insight, 2013).

4.2.6. Trend and Pattern of Manufacturing Exports of BRICS Countries

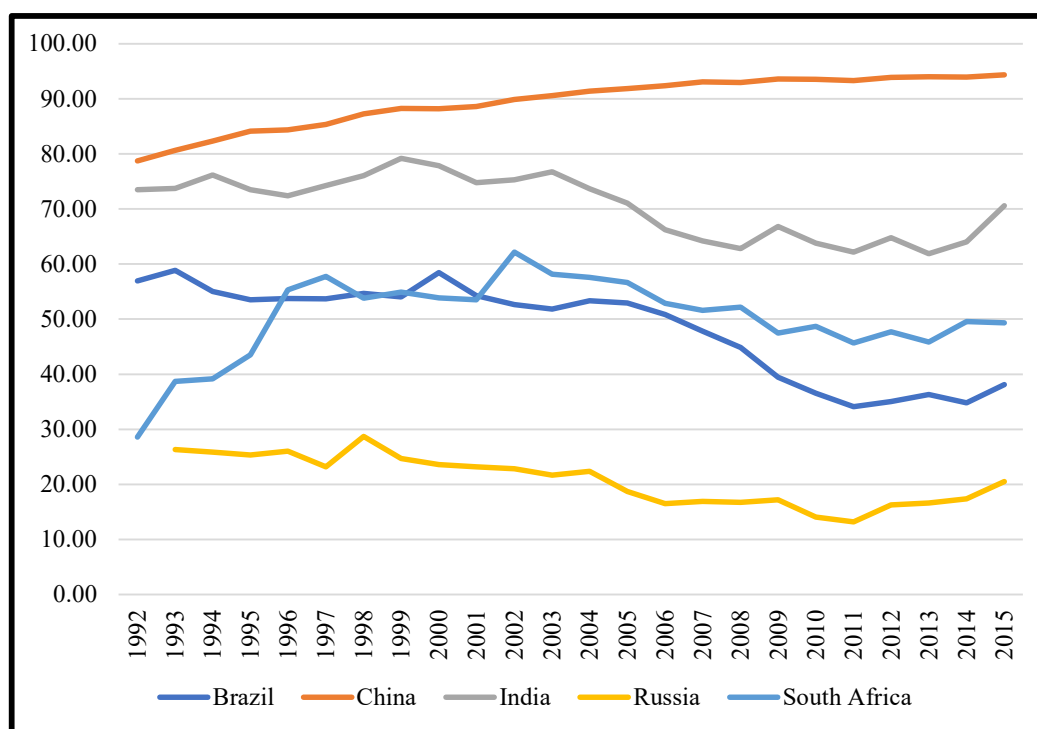


Figure 4.2.6.1: *Manufacturers Exports (% of Merchandise Exports) of BRICS Countries.*

In the above Figure 4.2.6.1 manufacturers exports (% of merchandise exports) are plotted for BRICS countries. The highest manufacturers exports (% of merchandise exports) are of China followed by India (Tabular data is presented in Appendix F). Lowest manufacturers are of Russia. China is the only country whose manufacturers exports (% of merchandise exports) continuously increased during the study period. In other BRICS countries, manufacturers exports have a declining trend over the study period. Brazil lost some part of manufacturing exports after 1991 as it was unable to overcome Asian competition particularly in some major industries of manufacturing sector (Torracca J. and Castilho M. 2015). India's manufacturers exports (% of merchandise exports) decreased because of less focused approach in identification and its exports are concentrated in low-value categories and low level of foreign direct investment in export-oriented industries. For the Chinese economy, increased manufacturers exports are because of numerous reasons for example, until 2008, 50% in corporate tax rebates to foreign firms in China that exported 70% of their production. Locating in SEZs, firms can get higher tax rebates. VAT rebates, lower tariffs on imported machinery, cash subsidies, discounted land rental rates and easy finance (Defever & Riano 2013). Chinese government also controls Yuan to increase its exports. In case of South Africa, this decline in manufacturers exports is result of bad macroeconomic policies, high-cost business environment (Soberdom M. and Francis T. 2002) and due to focus of firms on domestic market only (Edwards et al. 2009).

4.3. Financial Development Index of BRICS Countries

This section of the chapter is focused on the construction of financial development index of BRICS countries over the study period. To construct the financial development index of BRICS nations, market sector and banking sector based three indicators are considered namely broad money (% of GDP), domestic credit to private sector (% of GDP), and market capitalization (% of GDP). As these variables does not constitute same weight in financial development on an economy so to calculate their weights in a financial development of an economy. So, to obtain weights of these variables PCA approach is applied. And based on obtained factor scores financial development index for each BRICS country is calculated.

Table 4.3.1: Factor Scores of Variables of Financial Development Index of BRICS Countries

Variables	Brazil	Russia	India	China	South Africa
Broad Money (% of GDP)	49	35	34	36	33
DCP (% of GDP)	45	35	34	34	34
MC (% of GDP)	6	30	32	30	33
<i>Authors' Computation with E-Views 11.</i>					

In Table 4.3.1 weights of variables of financial development index of each BRICS country are presented. Based on eigenvalues that indicate that first components explain 52.65%, 82.69%, 92.01, 84.72%, and 86.93% for each BRICS country respectively (Appendix G). Based on eigenvalues, it is clear that first principal components describe the variations of dependent variable better than other linear combination of explanatory variables. In this case, first component is the best measure of financial development. So, to construct the financial development index, weights of

variables given by first eigenvectors are considered. After rescaling the individual contributions of all variables of an economy to 100 are presented in Table 4.3.1.

Table 4.3.2: Financial Development Index of BRICS Counties.

Year	FDI (Brazil)	FDI (Russia)	FDI (India)	FDI (China)	FDI (South Africa)
1992	68.15		29.73	62.29	90.18
1993	106.59	1.96	32.15	70.93	104.06
1994	53.31	2.80	34.87	66.37	114.74
1995	36.58	4.15	33.68	66.16	114.37
1996	36.82	7.33	33.20	71.35	109.98
1997	38.08	13.25	33.67	79.43	105.62
1998	33.99	15.16	33.33	86.78	97.70
1999	36.07	16.81	36.04	93.40	125.68
2000	38.80	18.73	39.52	98.02	111.14
2001	43.62	19.81	37.95	100.70	106.12
2002	41.93	24.01	40.04	102.45	108.76
2003	41.86	30.42	46.93	107.29	108.50
2004	43.45	32.53	49.71	101.85	127.27
2005	46.87	36.96	54.52	98.17	139.42
2006	50.95	48.80	61.59	102.42	163.87
2007	57.14	58.46	76.88	113.75	171.94
2008	59.83	46.92	74.69	110.95	129.87
2009	63.46	51.41	66.61	121.22	163.97
2010	66.75	50.21	72.77	125.34	157.00
2011	69.62	44.38	66.93	119.89	134.55
2012	73.05	42.82	62.60	121.21	149.45
2013	72.44	45.32	64.13	124.50	158.99
2014	74.93	45.30	65.17	130.64	162.60
2015	77.85	48.55	67.06	143.85	150.86
<i>Authors' Computation with MS Excel 2016.</i>					

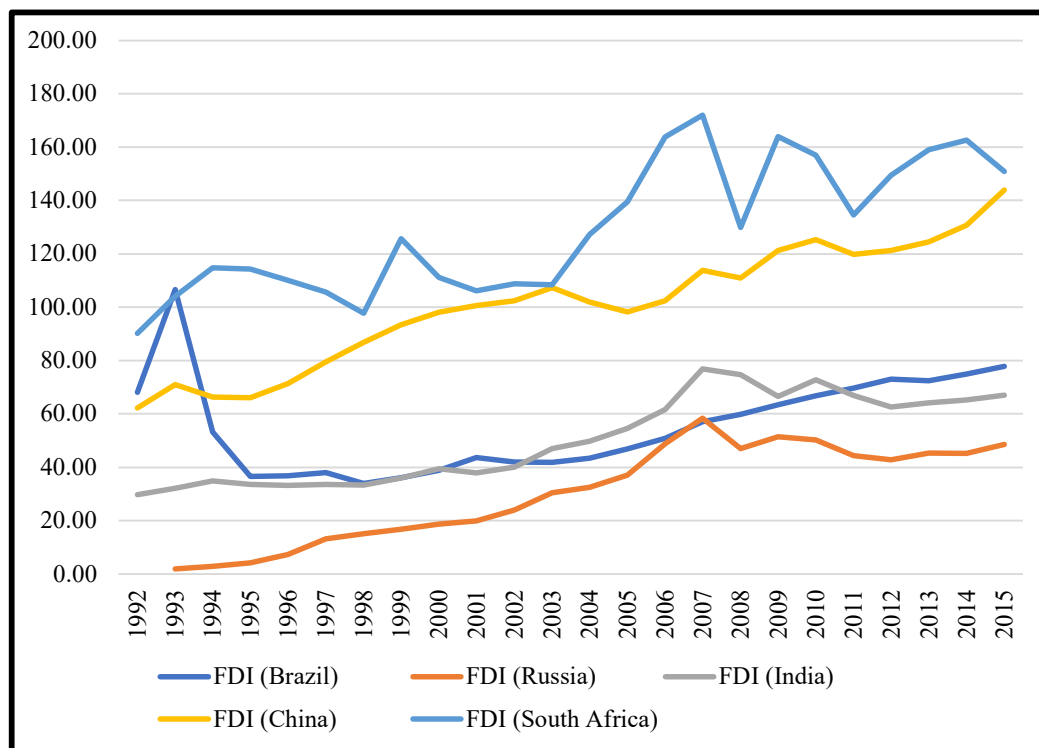


Figure 4.3.1: *Financial Development Index of BRICS Countries.*

In Table 4.3.2 and Figure 4.3.1 the financial development index of each BRICS nation is presented. In Figure 4.3.1 it is clearly visible that financial development of South Africa is highest among BRICS countries followed by China. Other BRICS countries are well below South Africa's and China's financial development. Russia's financial development is lowest among BRICS countries. The financial development of Brazil and India are very similar to each other except few initial years during this study period. Financial development of Russia, India, and China has a smooth increasing trend. The financial development of Brazil also increased smoothly except a few initial years around 1993 and 1994. South Africa's financial development is highly fluctuating over the whole study period. It is very clearly visible from the financial development of every BRICS country improved but the trend and pattern of financial development of all BRICS countries are different from each other.

Table 4.3.3: Descriptive Statistics of Financial Development Index of BRICS Countries.

	FDI (Brazil)	FDI (Russia)	FDI (India)	FDI (China)	FDI (South Africa)
Mean	55.50	30.70	50.57	100.79	129.44
Median	52.12	32.53	48.32	102.13	126.48
Maximum	106.59	58.45	76.88	143.85	171.93
Minimum	33.99	1.95	29.73	62.29	90.18
Std. Dev.	18.10	18.08	16.21	22.62	24.89
Skewness	0.90	-0.21	0.19	-0.16	0.25
Observations	24	23	24	24	24

In Table 4.3.3 descriptive statistics of the financial development index of BRICS countries are presented to understand the general behavior of the financial development index of BRICS countries over the study period. Mean value of Russia's financial development index is lowest (30.70) among other BRICS countries' index. The highest mean value (129.44) is of South Africa's index and the mean value of other country's financial development index are 55.50 (Brazil), 50.57 (India), 100.79 (China). Median values of index are 52.12 (Brazil), 32.53 (Russia), 48.32 (India), 102.13 (China), and South Africa (126.48). The maximum values of the financial development index for BRICS countries' during the study period are 171.93 (South Africa) followed by 143.85 (China), 106.59 (Brazil), 76.88 (India) and 58.45 (Russia). The minimum values of the financial development index for BRICS countries are 33.99 (Brazil), 1.95 (Russia), 29.73 (India), 62.29 (China), and 90.18 (South Africa). In the case of standard deviation, South Africa's financial development index has the highest (24.89) standard deviation followed by China (22.62), Brazil (18.10), and Russia (16.21). India's financial development index standard deviation is lowest (16.21) among BRICS Countries. Skewness of index is 0.90 (Brazil), -0.21 (Russia), 0.19 (India), -0.16 (China) and 0.25 (South Africa).

4.4. Conclusion of the Chapter

In this chapter, an attempt was made to construct the financial development index of BRICS countries by applying PCA approach. Before construction of index, a pictorial analysis of variables of the study is also done. Among financial development variables, market capitalization of each country is very volatile and has a very fluctuating trend, and other variables' trends and patterns also differ for each country. Results of this chapter show that financial development of each BRICS country increased over the study period, but the rate of increase and pattern is different for each BRICS country. For example, financial development of South Africa is the highest and increased in a very zig-zag manner during the study period, and China's financial development is just below South Africa's financial development but increased smoothly during the study period. The lowest financial development is of Russia among BRICS countries. Financial development of each BRICS country increased but at different rates and patterns over the study period.