

ROLE OF FINANCIAL DEVELOPMENT IN TRADE OF MANUFACTURING GOODS OF BRICS COUNTRIES

**A Thesis Submitted to Central University of Haryana for the Award
of the Degree of**

DOCTOR OF PHILOSOPHY IN ECONOMICS



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CERTIFICATE

This is to certify that the thesis entitled '**Role of Financial Development in Trade of Manufacturing Goods of BRICS Countries**' being submitted to the Department of Economics, Central University of Haryana for the award of the degree of *Doctor of Philosophy in Economics*, appears as the record of original work done by Mr. Naseeb Singh (Roll No. 10055) under my supervision and guidance. The matter presented in this thesis has not been submitted in part or full, for any other award of any degree/diploma of this university or any other university/institution.

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DECLARATION

I, hereby, declare that the thesis entitled '**Role of Financial Development in Trade of Manufacturing Goods of BRICS Countries**' submitted to the Department of Economics, Central University of Haryana for the award of the degree of *Doctor of Philosophy in Economics*, is a record of original research work done by me under the supervision and guidance of Dr. Ajeet Kumar Sahoo, Assistant Professor, Department of Economics, Central University of Haryana. The content of this dissertation has not been submitted in part or in full for any degree or diploma in any other university/institution.

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LIST OF ABBREVIATIONS

<i>ADF</i>	:	<i>Augmented Dickey Fuller</i>
<i>AIC</i>	:	<i>Akaike information criteria</i>
<i>ARDL</i>	:	<i>Auto Regressive Distributive Lag</i>
<i>BPO</i>	:	<i>Business Process Outsourcing</i>
<i>BRICS</i>	:	<i>Brazil, Russia, India, China, South Africa</i>
<i>BrM</i>	:	<i>Broad Money (% of GDP)</i>
<i>CUSUM</i>	:	<i>Cumulative Sum</i>
<i>CUSUMSQ</i>	:	<i>Cumulative Sum of Squares.</i>
<i>DCP</i>	:	<i>Domestic Credit to Private Sector (% of GDP)</i>
<i>ECM</i>	:	<i>Error Correction Mechanism.</i>
<i>FD</i>	:	<i>Financial Development</i>
<i>FDI</i>	:	<i>Foreign Direct Investment</i>
<i>FII</i>	:	<i>Foreign Institutional Investors</i>
<i>GDP</i>	:	<i>Gross Domestic Product</i>
<i>GVA</i>	:	<i>Global Value Added</i>
<i>H-O</i>	:	<i>Heckscher-Ohlin</i>
<i>LFDIB</i>	:	<i>Log of Financial Development Index of Brazil</i>
<i>LFDIC</i>	:	<i>Log of Financial Development Index of China</i>
<i>LFDII</i>	:	<i>Log of Financial Development Index of India</i>
<i>LFDIR</i>	:	<i>Log of Financial Development Index of Russia</i>

<i>LFDISA</i>	:	<i>Log of Financial Development Index of South Africa</i>
<i>LMEB</i>	:	<i>Log of Manufacturing Exports of Brazil</i>
<i>LMEC</i>	:	<i>Log of Manufacturing Exports of China</i>
<i>LMEI</i>	:	<i>Log of Manufacturing Exports of India</i>
<i>LMER</i>	:	<i>Log of Manufacturing Exports of Russia</i>
<i>LMESA</i>	:	<i>Log of Manufacturing Exports of South Africa</i>
<i>MC</i>	:	<i>Market Capitalization (% of GDP)</i>
<i>ME</i>	:	<i>Manufacturing Exports</i>
<i>OECD</i>	:	<i>Organization for Economic Co-operation and Development</i>
<i>OLS</i>	:	<i>Ordinary Least Square</i>
<i>PCA</i>	:	<i>Principal Component Analysis</i>
<i>SEZ</i>	:	<i>Special Economic Zone</i>
<i>SITC</i>	:	<i>Standard International Trade Classification</i>
<i>VAR</i>	:	<i>Vector Auto Regressive</i>
<i>VAT</i>	:	<i>Value Added Tax</i>
<i>WTO</i>	:	<i>World Trade Organization</i>

CHAPTER 1

INTRODUCTION

1.1. Introduction

The great trade collapse experienced in 2009 is one of the most striking phenomena observed in recent decades. The trade volume of world trade fell by 12% in 2009 which is much steeper than 1965, 1982, and 2001 (WTO, 2010). And the decline in manufacturing trade flows was more drastic. More interestingly, the world trade fell more than the world GDP in 2009 (Francois & Woerz, 2009). The main reason for this trade collapse was due to affected financial systems worldwide. This financial crisis affected financial systems in many ways. Firstly, many banks all over the world faced a credit crunch and massive bailouts. Secondly, in the year 2008 the world stock market capitalization lost nearly 50% of world GDP (Aisen & Franken, 2010). All these effects of an effected financial system underline the importance of a strong and stable financial system for an economy. And at the same time, the relationship between financial sector development and trade of a nation also received a lot of attention among economists. In economic literature, as most of the traditional international theories believed that a nation's trade is dependent on economy's endowments of land, labor, capital (H-O model). But still, causes of variations in trade openness between countries are debated among theorists. Some recent economic literature tried to explore the cross-country variations in the level of financial development and its effect on the trade flows of a nation. There are varieties of possible linkages between financial sector development and international trade, but this study only targets just one linkage. The primary purpose

of the financial system is channelizing savings to borrowers which may enable firms to increase economies of scale. Economies engage in foreign trade to get advantage of economies of scale (Krueger & Obstfeld, 1994). Therefore, the focus of this study is to access the role of financial sector development in high scale economies sector of BRICS nations. It might be demand driven, that countries with more exports in high scale economies have developed financial system. In this study, manufacturing goods sector is selected as high economies of scale sector as this sector is more credit intensive (Beck, 2001). Before exploring the relationship between financial sector development and trade of manufactured goods in BRICS nations a uniform financial development index is also formed for each BRICS country to have a clear and broad picture of financial development in these countries. But before constructing financial development index deciding variables for index was challenging as different researchers have used different indicators to measure the financial sector development. Ang and Mckibbin (2007) used liquid liabilities to nominal GDP, commercial bank assets plus central bank assets and domestic credit to construct financial development index of Malaysia. Khan and Qayyum (2007) used total bank deposit liabilities, clearing house amount, private credit, and market capitalization to construct financial development index of Pakistan. Principal component method (PCM) approach is adopted to obtain the weights of variables in these studies. In this study, financial development index of BRICS countries is constructed by considering three variables namely domestic credit to private sector (% of GDP), market capitalization of domestic credit to private sector) and broad money (% of GDP) (, Xu (2000), Fase and Abma (2003), Rioja and Valev (2004) Rahman Tahir (2008)). Weights of these indicators is calculated by using PCA

(Principal Component Analysis) approach. Financial development index of each BRICS country is used as proxy of financial development for respective countries. And manufactures exports (% of merchandise exports) is used as a proxy of trade in manufactured goods. As this study is exclusive in nature and involves various concepts so before moving further in study it becomes important to explore them scientifically.

1.2. Financial System

Finance is a huge amount borrowed and lend by debtors and creditors respectively, for a pre decided time and at a particular rate of interest (Gurley and Shaw, 1960). Finance can also be referred as monetary funds needed by individuals, business houses and government. And, the system which deals with finance and manages all activities related to finance is known as financial system or financial sector. A financial system is very broad in nature and comprises of financial markets, financial instruments, banks, financial services, regulatory bodies etc. and the main purpose of all these is to form an essential framework for mobilization of savings from savers to borrowers as it is the main purpose of any financial system in the world. A financial system is mainly classified in following two groups: -

1.2.1. Organized Sector

Organized financial system has a good network of banks, financial markets and has wide variety of financial instruments and services which are governed and controlled by proper laws and regulatory bodies in the country.

1.2.2. Unorganized Sector

Unorganized financial system is the system which is dominated by indigenous bankers, pawn brokers, moneylenders etc. which are not governed and controlled by any law and regulatory body in a country.

1.3. Financial Development

Over the years financial system all over the globe has evolved in terms of quality, quantity and efficiency and this process of evolution or improvement is known as financial development. According to Dorrucchi and Drutti (2007) financial development is the ability of an economy to channelize its savings into investments efficiently and effectively within boundary lines of regulatory bodies framework, variety in its financial instruments, size of its stock market and private agent's easiness in accessing them and financial market's performance in effectiveness, efficiency. As per Hartmann and Heider (2007) financial development is a process of financial innovation and improvements in institutions of financial system which decrease asymmetric information and increase completeness in the market, promote agents of financial system to engage in transaction at reduced transaction costs and increase competition.

1.4. Manufactured Products

As per world bank database, manufactured products include chemicals (Section 5), basic manufactures (section 6) excluding Non-ferrous metals (section 68), machinery and transport equipment (section 7), and miscellaneous manufactured goods (section

8), excluding division 68 (non-ferrous metals) of SITC (Standard International Trade Classification).

1.5. Finance and Trade Channel

There are a variety of linkages through which financial sector development can be used for trade comparative advantage. One of them is liquidity constraints that many firms face. According to this, if a countries' domestic financial system is inefficient and weak, exports-oriented firms are burdened by credit constraints which prevents many potential firms from entering the international trade (Chaney, 2005). On the other side, if less credit constraints are faced by firms, it can lead to increased investment and all potential firms become exporters (Melitz, 2003). The main findings of research papers revealed that financial system development promotes production as well as trade of a nation. Beck (2002) also suggests that financial development and trade relationships are subject to economies of scale, as financial system development shifts producer incentives towards increasing returns to scale good. High economies of scale sector gain more profits more from a higher financial development as compared to a sector without economies of scale. Better financially developed economies have a comparative advantage in high scale economies sectors and becomes net exporters.

1.6. Profile of BRICS countries

Jim O'Neil coined the term BRIC in 2001 for four countries (Brazil, Russia, India and China) which were deemed to be at same stage as of advanced economies by the year 2050. And BRIC nation's leaders made the first summit in 2009 and this group

became a formal institution in 2010. South Africa joined this group in 2011. So, to understand BRICS as a group, it is important to know where these five emerging economies are placed in the global context. Currently, BRICS together holds 27% of the world's GDP, 42% of the world's population, 26% of world's land territory and 40% of the world's total labor force. Its contribution has increased in global value added (GVA) of manufacturing from 2.6 % (1971) to 16.5% (2008). For growth, BRICS is becoming more dependent on manufacturing. As a group BRICS have abundance natural resources, finances, and consumers to impart further momentum to manufacturing.

Individually, BRICS nations stand very different in terms of their values and goals. They have different economic policies, structural characteristics, and geopolitical importance. China is dominating in manufacturing sector and India is dominant in software engineering, generic pharmaceuticals, BPO and textiles. South Africa is rich in natural resources (mainly mining). Each BRICS country's capital markets developed during different times and at different rates. Among BRICS countries, India and Russia mainly driven by domestic demand. In terms of landmass, Russia is largest in the group as well as largest in world. Goldman Sachs predicted that China and India will have dominance in manufacturing goods and services respectively, while Brazil and Russia will have dominance in supply of raw material globally. India and Brazil are democratic, while Russia and China are not. Structure of financial systems, income level, education, health challenges also differ within BRICS nations.

1.7. Rationale and Objectives of the Study

This study is focused on measuring financial development of BRICS countries and examining the relationship between financial development and manufacturing exports of BRICS countries. Financial development of any economy is very vast in scale. So, it will be very interesting to measure the financial sector development of BRICS countries on a unified scale and compare with each other and finding out where they stand in comparison to each other. It can also be easier for policy makers to understand financial sector development and later using financial sector for policy designing.

While exploring a possible link between financial development and trade of manufacturing goods in BRICS countries, it will be interesting to find whether financial development has an effect on manufacturing exports or not. If financial development effect is found on manufacturing exports then it will underline the importance of financial sector for promotion of manufacturing exports and trade balance of a country. The significant link between financial development and manufacturing exports will also have implications for the theory of international trade. And exploring this link in BRICS countries will be much interesting as BRICS countries are very heterogenous in nature.

Therefore, based on the rationale of the study, this study aims at the following objectives: -

- i. To analyze the trend and pattern of variables used in the study.
- ii. To construct the financial development index of BRICS countries.
- iii. To assess the role of financial development in the performance of manufacturing exports of BRICS countries.

1.8. Propositions of the Study

Proposition 1

There is significant and positive relationship between financial development and manufacturing exports of Brazil.

Proposition 2

There is significant and positive relationship between financial development and manufacturing exports of Russia.

Proposition 3

There is significant and positive relationship between financial development and manufacturing exports of India.

Proposition 4

There is significant and positive relationship between financial development and manufacturing exports of China.

Proposition 5

There is significant and positive relationship between financial development and manufacturing exports of South Africa.

1.9. Organization of the Study

The contents of this study are organized into following six chapters:

Chapter 1: Introduction

In this chapter, introduction of the problem and background of the problem is explained. And concepts related to this study are also explained in this this chapter like financial development, financial system and its types, manufactured products. Profile of the BRICS countries and finance-trade channel are also explained in this chapter. Rationale and Prepositions of the study are also part of this chapter.

Chapter 2: Review of Literature

In this chapter, existing literature related to this study is explored comprehensively. Review of literature is divided in three parts namely review related to financial development determinants, review related to financial development and economic growth and review related to financial development and trade.

Chapter 3: Research Methodology

This chapter outlines the research methodology used in the study to analyze the data and to draw results. In this chapter, research methodology related to every objective is explained elaborately in a sequential manner.

Chapter 4: Construction of Financial Development Index for BRICS Countries

This chapter is devoted to analyze the trend and pattern of variables used in the study and also constructing, measuring and comparing the financial development index of BRICS countries over the study period.

Chapter 5: Role of Financial Development in the Performance of Manufacturing Exports of BRICS Countries

In this chapter, co-integrating relationship between financial development and manufacturing exports of each BRICS country is examined. Long-run and short-run estimates are also examined. Directional causality between the financial development and manufacturing exports is also examined.

Chapter 6: Conclusion, Findings, Policy Implications and Future Scope of the Study

This chapter is the last chapter of this study, which encompasses the whole study. Study is finally concluded in this chapter. The findings, policy implications and future scope of this study are also mentioned in this chapter only.

CHAPTER 2

REVIEW OF LITERATURE

2.1. Introduction

Before analyzing the relationship between financial development and manufacturing exports, it is important to review existing literature and to understand theoretical background related to it. Schumpeter (1911) was the earliest economist who laid down the importance of finance and services of financial intermediaries in promoting innovation and growth in an economy. Some other economists also mentioned that financial sector helps in growth of an economy. But it was Goldsmith (1955) who did a systematic analysis of financial sector development and growth and he also found positive relation between both. C. Rangarajan (1998) also highlighted the importance of financial sector in achieving the sustainable economic growth.

But the motive of this study is to check whether financial development influences the manufacturing exports of BRICS nations or not. So, in this direction international theories were explored and most of international theories conclude that factor endowments, technologies and scale of economies are main determinants of trade among economies. The basic H-O model explains that country abundant in any factor will have comparative advantage in good intensive in abundant input factor. But some recent literature has also mentioned that financial sector development can influence the pattern of trade of a nation. One of the first papers and important paper in this field is of Kletzer and Bardhan (1987). They used H-O tradition model with two nations, two sectors, and two factors. They allowed both the sectors dependent on

land and labor, while assumed one sector is also dependent on external financing for capital. And the results showed that nation with a low credit restriction specializes in that sector which utilize external finance for the capital. Beck (2002, 2003) in his paper assumed both the sectors (manufacturing and agriculture sector) to be dependent on external finance. Manufacturing sector has increasing returns to scale feature and is more credit intensive as firms in this sector needs working capital to purchase technology regularly. Agriculture sector has constant return to scale feature as in this sector production takes place with inherited technology. Thus, the quality of technology and price is determined by external funds available for working capital. Since financial sector development diverts the producer's incentives towards the increasing returns to scale good. Other things remaining the same, better financially developed countries become net exporters of the manufactured goods. Chaney (2005) also argued that firms overcome barriers of international trade when they get external finance easily or large number of companies get cheap external finance. Consequently, large number of firms export and exports rise. Rajan and Zingales (1998) also highlighted that countries with poor financial sector development have high cost of external finance in comparison with high financially developed countries. Svaleryd and Vlachos (2002) treat financial sector as a factor of production. An economy with good well-developed financial system specializes in those sectors use more financial sector services. So, economies with better financial system specializes in those industries which are more dependent on external financing. As per Taylor (2008), as a result of financial sector reforms entrepreneurs face less restrictive credit constraints and then investment gets increased.

Melitz (2003) explained that based on his production capacity an entrepreneur can choose to produce for the home country or to bear additional export cost. Increased trade openness leads to decreased exporting cost and increased ability of the producers to export. Improved financial sector development, leads to increased investment, also enhances the marginal effects of trade liberalization in rising the average productivity as well as company size. Acemoglu and Zilibotti (1997) showed that investors who are risk averse likes to invest in low return projects in those countries where capital is scare. Fanelli and Keifman (2002) showed that in only large and well-established companies are in poor financial developed nations. Rajan and Zingales (1998) also mentioned that total trade flows are more effected by number of exporting firms rather than the volume of export exported by each firm. Manova (2005, 2006) mentioned that entry in market not only depends on exporter's financial development but also on the size of market of importer. As, firms profit increases with the size of the importer's country size. It is also believed that well financial developed countries have a greater number of partners in trade and also have ability to export to smaller markets, especially in those sectors which are financially sensitive. Finally, several authors have studied the role of exchange rate on trade while considering financial development. Becker and Greenberg (2003, 2007) mentioned that in less financially developed countries exports are less effected by exchange rate fluctuations. Chaney (2005) also argued that change in exchange rate causes larger movements in export volumes if financial markets are perfectly developed.

The existing literature related to this study is explained below in elaborately manner and has been divided in below mentioned in three parts: -

- i. Studies related to determinants of financial sector development.
- ii. Studies related to financial development and economic growth.
- iii. Studies related to financial development and trade.

2.2. Studies Related to Determinants of Financial Sector Development

Moustain and Fatima (2004) checked the causality between financial sector development and economic growth during 1970-2000. Variables considered for financial development were liquid liabilities as percentage of GDP, domestic credit by the banking sector as percentage of GDP, domestic credit to the private sector as percentage of GDP and Gross domestic product as proxy of economic growth. Johansen Co integration test was applied to analyze data. Findings revealed that only short-run and irregular relationship occurs between both the variables.

Chinn et al. (2008) tried to examine the factors which effect financial development. Study was done on 108 countries from 1980-2000. Variables used in study were market capitalization, credit to the private sector, capital openness index etc. Study concluded that financial openness contributes in equity market development.

Lu and Yao (2009) analyzed financial development, effectiveness of law and economic growth of China over the period of 10 years. Proxies used for financial development were share of credit, bank competition, share of private credit and effectiveness of legal system. Regression method is applied for analysis of data. Findings of study revealed that improving law alone cannot enhance total financial development of China.

Burcu et al. (2009) tried to analyze the relationship between financial sector development and growth using data of 10 countries (emerging countries) from 1968-2007. In this study researcher considered liquid liabilities, bank credit (% of GDP), private sector credit, GDP, gross fixed capital, government final consumption expenditure as percentage of GDP, trade volume as variables of study. Researcher used panel unit root tests, panel co-integration and Fully Modified Ordinary Least Squares (FMOLS) methods. Results revealed that there is long-run relationship between financial development and growth.

Dogbey (2010) tried to find out whether financial development is communicable or not. Proxies used for financial development were domestic credit to the private sector, private credit by banking sector and market capitalization. Independent variables were initial GDP per capita, spatial weight matrixes, lagged level of financial development and regional dummies over period of 1985-2000. Spatial Auto Regressive model (SAR) and Spatial Error Model (SEM) applied to analyze the data. Bureaucratic efficiency is vital to enhance financial sector development.

Hye (2011) constructed financial development index of India. He also examined the relationship between financial sector development and economic growth of India. To check stationarity of data series Phillips Perron, ADF unit root test and Ng Perron unit root tests were applied. ARDL approach is applied to check co-integration. Findings of the study show that financial development is negatively associated with economic growth of India in case of long and short-run.

Minija (2012) tried to examine the relationship between financial sector development and growth of India. Firstly, financial development index is constructed of India by

using PCA approach in pre-liberalization period and post-liberalization period. Bounds test for cointegration is applied to check cointegration, direction of causality is checked using VAR granger causality test. Co-integration is found in the post-liberalization period only. In pre-liberalization period financial development leads economic growth and in post-liberalization period economic growth promotes financial development.

Adusei (2013) in his study tries to check the relationship between financial development and GDP of Ghana from 1971 to 2010. To measure financial development of Ghana three proxies are used: domestic credit to private sector (% of GDP), domestic credit (% of GDP) and broad money (% of GDP). To investigate relationship fully- modified ordinary least square (FMOLS), Error correction and GMM methods employed. Findings of this study revealed that financial development undermines economic growth of Ghana.

Takyi and Obeng (2013) in his paper tries to determine the determinants of financial sector development in Ghana from 1988 to 2010. As proxy of the financial development of Ghana he used only one variable namely domestic credit to private sector (% of GDP).

Raja et al. (2014) investigated the determinants of financial sector development in developed and developing countries using panel data. Time period of the study is from 1990 to 2012 and 27 developed and 30 developing countries considered in this study. Financial development is represented by credit to private sector in selected countries. Hausman test is applied to check whether random effect model is more appropriate or fixed effect model. Findings revealed that all exogenous variables have significant impact on financial development.

Badeeb and Lean (2015) tried to highlight on the major determinants of financial sector development in Yemen. The result demonstrated trade openness, economic growth, natural resource dependence and inflation are major determinants of financial sector development in Republic of Yemen. Financial development is positively impacted by trade openness and economic growth, while the natural resources dependence has negative impact on financial development. To construct new proxy of financial development PCA approach is applied. To construct this financial development index three variables are used namely M2, domestic credit and bank deposits as % of GDP.

Puatwoe and Piabua (2017) tried to check the effect of financial development on economic growth of African countries. Three indicators of financial sector development were used namely broad money, domestic credit, and bank deposits. ARDL technique used to estimate the results. Findings of this study revealed that in short run positive relationship exist between M2, government expenditure and economic growth and negative between private investment, bank deposits and economic growth. And in long run there is positive and significant effect of financial sector development on economic growth.

2.3. Studies Related to Financial Development and Economic Growth.

Rangarajan C. (1998) focused on the role of financial sector in an economy to achieve sustained growth in India. He argued that a good financial system is very important to improve savings, investment and productivity in an economy. The nature and extent of government intervention, interest rate deregulation, prudential norms and directed credit like efficiency parameters were also discussed while evaluating

financial sector. Findings of the study shows that India has initiated many reforms and based on these reforms a well-established banking system will be established. And this well-established banking system will lead to better economic growth in future.

Xu (2000) studied effect of financial sector development on domestic investment in 41 countries during 1960-1993. FDI (Financial Development Index), real GDP and real domestic investment were considered in the study. He used multivariate VAR and impulse response function. Findings show that financial development is vital for growth.

Omran and Bolbal (2003) analyzed the role FDI in growth of an economy and financial development in 17 Arab countries from 1975 to 1999. Cross country regression and pairwise granger causality test methods were applied to analyze the data. Domestic credit to private sector from commercial banks (% of GDP), commercial banks assets, FDI, central bank assets, total value of shares traded (% of GDP) variables are used in the study. All 17 countries were divided into 3 groups as Gulf Countries, reform countries and other countries. Causality between financial development and FDI is checked based on these groups. Findings of the study also reveal that financial development in Arab Countries is related with bank.

Dehejia and Muney (2003) studied the state-level banking regulation of US and also tried to check the impact of these regulations on financial development and economic growth in US between 1900-1940. They examined different pathways through which financial development can improve growth and also examined the impact of these laws on manufacturing, range of firm and human capital outcomes. Findings of study concluded that not all types of financial development effects economy growth

positively, financial expansion policy by state deposit insurance have negative impact on economic growth. They also studied the political economy process by which these laws are adopted.

Rahman (2004) tried to find out whether output growth and higher investment in long-run leads to financial development. Time period studied is 30 years (1976-2005). The variables were weighted average of annual interest rate on lending by banks, domestic credit, broad money, total deposits, gross fixed capital formation and per capita. Vector Auto Regressive (VAR) model was used to analyze the data. Findings of the study show there is co-movement between financial development and investment and per capita income in the long run.

Khan and Qayyum (2007) tried to check the effect of financial liberalization and trade on economic growth in Pakistan economy over the period 45 years (1961-2004). Bound test for co-integration approach is used to analyze the data. To check stability of model CUSUM and CUSUMQ method were used. In long-run, trade and financial policies play vital role in promotion of growth of Pakistan but with slow rate of adjustment. While, in short-run trade policy variables and deposit rate are very slow, which suggested acceleration in reform process of Pakistan.

Rathinam (2007) studied the financial sector development and growth puzzle in India. determinants like legal, institutional and financial regulations were focused. To develop financial development index M2 over nominal GDP, private credit was used. PCA is used to develop financial development index. Analysis of data was done with the help of Multivariate VAR frame work, Granger causality test and Vector Error Correction (VECM) model. Results of the study showed that institutional and legal

developments have positive impact on financial development and financial regulation have negative impact on financial development in long-run.

Chakraborty (2008) checked whether financial development causes economy growth in India since 1996. Quarterly data was used for the period 1993-2005. Techniques used to analyze the data were Engle-Granger, Johnson cointegration and Granger causality test. Findings of the study revealed that investment-output ratio has significant and positive effect on real growth rate of GDP. The findings showed less support to the theoretical prediction that share market improvements would play a vital role in promoting growth. Instead, the banking sector reform seems to enhance economic growth much significantly.

Jedidia (2014) checked the relationship between financial sector development and economic growth of Tunisia during 1973-2008. Domestic credit to private credit (% of GDP), value traded and issuing bank's securities on the financial market were considered as financial sector development variables. ARDL method was used as this model overcomes the bias related to unit roots and co-integration tests. Results revealed positive effect of domestic credit to private sector on economic growth of Tunisia and bi-directional causality between development of banking sector and economic growth.

Duasa (2014) tries to investigate the impact of financial development on economic growth or impact of economic growth on financial development in selected OIC countries. For this purpose, data collected ranges from 1960-2005. To analyze the data VAR and VECM approach is used. Findings of the study revealed that in Egypt and Malaysia bidirectional causality relationship exists and in Jordan and Iran

unidirectional relationship exists while in Behrin, Kuwait and Libya, Saudi Arabia and Pakistan no causality relationship exists between financial development and economic growth.

Lenka (2015) explored the role of financial development in economic growth of India during 1980-1911. He did a time-series analysis by using Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) for stationarity, Bounds co-integration for co-integration, ECM for short run and long run estimates. Findings show that financial sector development and economic growth have cointegration equation. He suggested to introduce further financial sector reforms.

Wait, Ruzive and Roux (2017) checked the influence of financial market developments on high economic growth of BRICS as compared to non-BRICS counterparts. They analyzed financial market development and financial sector reforms in BRICS countries. They regressed many financial sector indicators against real GDP growth, capital accumulation and productivity. They used VECM, three stage least sq. and Vector auto-regressive models. Panel data analysis is done to check the influence of financial sector indicators. Conclusion of study was that 1% increase in depth of financial market increases causes BRICS countries to grow 13% faster than non-BRICS countries and 1% of increase in credit to the private sector causes BRICS countries to grow 2.32% faster than non-BRICS countries.

2.4. Studies Related to Financial Development and Trade.

Bardhan and Kletzer (1987) focused on main function of financial system which is channelizing money from savers to investors. They assumed that in every country, one sector produces an intermediate good while another produces final good. To

produce final good, intermediate good is required as input. Thus, final good sector for working capital requires external funds. And due to information asymmetries between producers and fund lenders, external financing has moral hazard problems. So, less developed financial systems are not able to remove information asymmetries and apply rationing. On the other side, for well-developed financial systems makes it possible to reduce frictions and adequately financing working capital. As per them external financing is required for final good sector not for intermediate good sector. So, final good sector is the one which gets profited from financial development. Finally, findings of the study show that economies with better financial system have a comparative advantage in the final good. And the economy with weaker financial system has comparative advantage in the intermediate good.

Beck (2002) checked the effect of financial development on trade in manufacturers. Study was conducted on 65 economies over the period of 30years (1966-1995). Proxy used for financial development is domestic Credit to the private sector. Unobserved heterogeneity and reverse causality are controlled in study. Results of the study reveal that economies with financial systems have higher manufacturing exports in total exports and also have higher trade balance in manufacturing goods. And the impact of financial development on manufacturing exports is stronger in long-run as compared to the short-run.

Svaleryd and Vlachos (2005) tried to check the effects of financial sector on the pattern of industrial specialization in OECD countries. Findings of the study revealed that economies with developed financial system specialize in external finance dependent industries. Findings also show that financial systems are more important

determinant in pattern of industrial specialization between OECD countries than human resource.

Huang and Temple (2005) in his study studied the relationship between trade and finance. His study period is 1991-2001. Principle component analysis (PCA) is used to measure financial development. OLS and instrumental variable (IV) procedures were used. Based on results, in high income countries strong evidence was found that trade promotes bank-based financial development, which is not the case in low-income countries.

Herge, Hodler and Lobsiger (2008) tried to understand important determinants of financial development like trade, culture and institutions in explaining the huge difference in size of secondary market in different countries. To analyze the difference in financial development of different countries an integrated test on institutional quality, cultural values and beliefs and trade was conducted. Study concludes that domestic market should be left open to foreign trade competition.

Shahbaz and Rahman (2008) examined the relation between exports, financial development and growth in Pakistan. Bound test for cointegration applied to check cointegration among variables. For direction causality, Granger causality approach is used. In long-run co-integration exists between financial development, exports and economic growth. Causality results shows causality between financial development and economic growth, financial development and exports and exports and economic growth. Study concluded that Pakistan policy makers can sustain exports growth by increasing economic growth and financial development.

Samba and Yan (2009) checked the relation between financial sector development and trade in manufacturing goods in East Asian countries. Time series analysis was done using VAR model to check long run relationship between financial development and trade in manufactured goods. The findings of the study suggested that in most countries, trade in manufactured goods increases financial development.

Susanto, Rosson and Costa (2011) empirically investigate the effect of financial development on trade of agriculture and manufactured products. Findings of the study revealed that financial development has positive impact on bilateral trade flows for manufacturing sector, as compared to agriculture sector. But this impact varied across different regions. Findings show that financial development's impact on both sectors are higher in developing countries as compared to advanced economies.

Susanto and Rosson (2011) investigated any possible linkages between financial development and agricultural exports in 49 countries. To analyze the data binomial models of gravity equations are applied. Financial reforms index is used to represent financial development index. Findings of this study reveal that advance countries have more positive impacts on agriculture exports as compared to developing countries (Kalina, 2013).

Kiendrebeogo (2012) tried to address the question of whether country's manufacturing trade is affected by development of its financial sector. Role of institutions is also investigated in this relationship. Study used pure cross sectional and panel specifications on 75 countries over the period 40 years (1971 to 2010). Study found that financial development has positive and strong effect on

manufacturing exports. This effect is found more stronger in those economies which have high quality institutions.

Kalina (2013) found out 3 mechanism and quantify them through which credit constraint affect trade, they are selection of heterogeneous firms into production, level of firms exports and the selection of domestic manufactures into exporting. Panel data was used to look the variations among financial sector development across different economies. As per this study, credit constrains impacts trade is by reduction in total output as much as 25%.

Wamboye and Mookerjee (2014) analyzed the nexus between financial development and manufacturing exports. Time series data of 29 African countries is considered. It was important from Africa point view as export diversification away from agriculture and resources is always important part of Africa's growth strategy. Findings revealed that out of 29 African countries, in 11 economies financial development promotes manufacturing exports and in 7 economies manufacturing exports promotes financial development.

Rahman and Farooq (2015) analyzed the relationship between financial development, economic growth and international trade of Australia over the period of 1965-2010. The ARDL bounds test for co integration is applied to check co-integration and long run relationship. The findings revealed that financial development, international trade and capital drives economic growth both in short run and long run. Financial development causes economic growth validating supply-side hypothesis.

Gokmenoglu, Amin and Taspinar (2015) checked the relationship between financial sector development, trade and growth of Pakistan. For stationarity ADF and PP tests were applied and in order to check co-integration Johansen co-integration test is applied. The direction of causality among variable is checked by Granger causality test. Findings of the study show that international trade and financial development increase economic growth in Pakistan.

Rasoulinezhad and Jabalameli (2018) tried to explore similarities in trade integrations of BRICS countries during 2001 to 2014 using time series data. They employed Panel-Gravity model in study. Variables considered in study were GDP, difference in income, trade openness, exchange rate, geographical distance, and Multilateral Resistance Term. Findings of the study show that different countries have dissimilar integration trade patterns in raw material and manufactured products, among the BRICS nations.

Khatun and Bist (2019) examined the relationship between financial development, economic growth and openness in financial services trade in BRICS nations (1990-2012). To measure financial development an index is constructed using PCA technique. In index banking sector, stock market, bond market and insurance sector developments were included. Findings of the study revealed that financial development have positive and significant impact on growth but to get advantage of openness in financial services trade, countries need to put more focus on development of stock market, bond market and insurance sector.

CHAPTER 3

RESEARCH METHODOLOGY

3.1. Introduction

This study is focused on examining the role of financial sector development in manufacturing exports of BRICS countries over the period of 26 years (1990- 2015). To examine the role of financial development in exports of manufacturing goods in BRICS countries, a comparative time series analysis is done over the study period. But prior to this comparative analysis, trend and pattern of macroeconomic variables included in study is analyzed using simple line chart and a financial development index for each BRICS country is also constructed. Trend and pattern of variables is analyzed to get in-depth understanding of the variables. Financial development index for each BRICS country is constructed to have a standard measure of financial sector development. For the purpose of construction of financial development index of each BRICS country, three macroeconomic variables are taken into consideration. They are market value of domestic listed companies (as % of GDP), domestic credit to private sector (as % of GDP) and broad money (as % of GDP). The weights of these variables are obtained by principal component analysis approach (PCA). After construction of financial development index for each BRICS country, the role of financial development is empirically examined on manufacturing exports. To examine the role of financial development on trade of manufactured goods Auto Regressive Lag (ARDL) model is applied (Pearson et al., 2001). But before applying ARDL model, stationarity of time series is also checked and lag length selection criteria for models

also performed to decide the adequate number of lags for models. The detailed process of this methodology is explained ahead:

3.2. Time Period, Data Sources and Variables of the Study

3.2.1 Time Period of Study

For this analysis, annual time series data is considered from of 1990-2015 for BRICS nations.

3.2.2 Data Sources

Secondary data is used in this study and the data sources are World Bank database (2019) and Fred Economic database (2020).

3.2.3. Definitions of Variables Considered in Study

3.2.3.1. Broad Money (% of GDP) - Broad money is the total sum of currency outside banks; demand deposits other than those of the central government; the time, savings, and foreign currency deposits of resident sectors other than the central government; bank and traveller's checks; and other securities such as certificates of deposit and commercial paper.

3.2.3.2 Market Capitalization of Listed Domestic Companies (% of GDP) -

Market capitalization (also known as market value) is the share price times the number of shares outstanding (including their several classes) for listed domestic companies. Investment funds, unit trusts, and companies whose only business goal is to hold shares of other listed companies are excluded. Data are end of year values.

3.2.3.3. Domestic Credit to Private sector (% of GDP) - Domestic credit to private sector refers to financial resources provided to the private sector by financial corporations, such as through loans, purchases of nonequity securities, and trade credits and other accounts receivable, that establish a claim for repayment. For some countries these claims include credit to public enterprises. The financial corporations include monetary authorities and deposit money banks, as well as other financial corporations where data are available (including corporations that do not accept transferable deposits but do incur such liabilities as time and savings deposits). Examples of other financial corporations are finance and leasing companies, money lenders, insurance corporations, pension funds, and foreign exchange companies.

3.2.3.4. Manufactures Exports (% of Merchandise Exports) - Manufactures comprise commodities in SITC sections 5 (chemicals), 6 (basic manufactures), 7 (machinery and transport equipment), and 8 (miscellaneous manufactured goods), excluding division 68 (non-ferrous metals).

3.3. Methodology of the Study

In this study, first objective is to analyze trend and pattern of macroeconomic variables used in the study for each BRICS country. To analyze trend and pattern of variables simple line chart is used. The second objective is to construct the financial development index of each BRICS countries to measure and make comparison of the financial development of BRICS countries. Last objective is to check relationship between financial sector development and manufacturing exports in each BRICS

country. Research methodology of each objective is explained below elaborately and in a sequential manner:

3.3.1. Methodology to Analyze the Trend and Pattern of Variables

First objective of the study is to analyze the trend and pattern of variables used in this study. To analyze the trend and pattern of variables line charts are used as line charts provide very easy picture of the trend and pattern of variables over the study period which makes it very easy to analyze and compare the data.

3.3.2. Methodology for Construction of Financial Development Index

To analyze and compare the level of financial development of BRICS countries, Financial development index of these countries are constructed. For this the applied method involves below mentioned five steps: -

Step 1 - At first yearly data is taken for broad money % of GDP, domestic credit to private sector % of GDP and market capitalization % of GDP for each BRICS Countries from 1992 to 2015 (Russia financial development index is from 1993 onwards).

Step 2 -At second step, weights of proxies of financial development obtained through Principal Component Analysis.

Step 3 - Then, obtained weights are multiplied by corresponding variable value.

Step 4 - At last step, value obtained through multiplication are added and divided by the total weight.

Step 5 - Obtained value is financial development value for that country in that year.

3.3.3. Methodology to Examine the Relationship between Financial Development and Manufacturing Exports of BRICS Countries

One of the objectives of the study is to empirically examine the relationship between financial sector development and trade of manufacturing goods in BRICS nations over the study period. To fulfil this objective following step are performed: -

Step 1- Firstly, financial development index and manufacturers exports (% of merchandise exports) are considered as proxy of financial development and manufacturing exports of BRICS countries respectively over the study period (1990 – 2015).

Step 2- Next, stationarity of all data series is checked using ADF test of stationarity.

Step 3 - At third step, optimum lag length selection is decided by using optimal lag length criteria.

Step 4 - In next step, bounds test for co-integration (ARDL model) is applied to check the co-integration between financial development and manufacturing exports for each BRICS country.

Step 5 - After checking co-integration among variables, long-run and short-run relationship is checked with the help of ARDL.

Step 6 - Directional causality is checked between financial sector development and manufacturing exports for the countries where co-integration exists, VAR granger causality test is applied to check directional causality.

Step 7 - At last, to check any miss specification in the model, diagnostic tests (normality, heteroscedasticity, serial correlation and stability tests) are applied.

3.4. Model Specification

Based on literature the relationship between manufacturing exports and financial development can be specified as follows: -

$$LME = \beta_0 + \beta_1 LFDI + \varepsilon_t \quad (3.1)$$

Where,

LME is log of manufactures exports (% of merchandise exports) used as the proxy of manufacturing exports.

LFDI is log of financial development index used as proxy of financial development.

β_0 is intercept, β_1 is trend and ε_t is error term.

3.5. Tools and Techniques Used in the Study

3.5.1. Line Chart and Descriptive Statistics

To understand the behavior of raw data line chart and descriptive statistics are important. In this study also, line charts and descriptive statistics are used. Line charts are used to analyze the trend and pattern of variables and financial development index. And descriptive statistics are used for comparative analysis of financial development index of BRICS nations. In descriptive statistics mean, median mid value, standard deviation and Skewness information is provided. So, to understand the behavior of raw data line chart and descriptive statistics are important to explain. In this study, Line chart are plotted with the help of MS-Excel software.

3.5.2. Principal Component Analysis (PCA)

PCA is an indicator reduction technique to study observed indicators that would result in smaller number of interpretable components (Sricharoen & Buchenrieder, 2005).

Generally, the size of eigenvalue reflects the size of variance in the principal components. The first component describes the largest proportion of total variability in the set of considered indicators. The next component describes the next largest amount of variability not described by the first principal component, and so on. In this study, PCA technique is applied to construct the financial development index. With the help of PCA approach, component scores of each variable are calculated and based on these component scores financial development index is constructed for each BRICS country. It will represent the overall financial development of each BRICS country and this measure also deals with multicollinearity and over parameterization (Ang & Mckibbin, 2007).

3.5.3. Unit Root Test (ADF Test)

Stationary testing is one of the important assumptions of standard regression analysis. Most of the macroeconomic time series are often not found stationary. Therefore, as a preliminary test it is important to check the stationarity of time series variables to avoid getting bias and estimates or spurious result. Unit root test also helps to decide the further technique to be considered for the study e.g., if data is stationary of I (2), ARDL model will crash. A stationary time series has mean, variance and autocorrelation constant over a period of time. There are many tests available to check stationarity of time series like Phillips-Perron test, KPSS test, Augmented Dickey Fuller (ADF) test, Zivot-Andrews test etc. In this study, ADF test is applied to examine each variable for the presence of unit root as this test is most popular among unit root tests.

3.5.4. Auto Regressive Distribution Lag Model (ARDL)

In this study, an attempt is also made to check cointegration between variables using bounds test for co-integration technique. It is applied to check whether financial development has any long run or short run effect on manufacturing exports. There are a few approaches to check the existence of long run relationship among variables like Engle and Granger co- integration test (1987), Johansen co-integration test (1988), Philips and Hansen co-integration test (1990) which concentrates on cases where variables are integrated of order I (1) and large sample size.

In this study, ARDL model is applied as it is considered most appropriate procedure for this study (Pesaran et. al 2001).

ARDL model is applied because of following reasons:

- i. In ARDL long run relationships are estimated by focusing on the dynamics of single equation, where the long run and short run dynamics are estimated jointly.
- ii. This study has small sample size of 26 years and ARDL model is appropriate to deal with small size. (Gounder, 2002; Pattichis ,1999; Tang, 2001)
- iii. ARDL technique is applicable in both cases whether regressor in the model is I (0) or I (1). However, the procedure will however crash in the presence of I (2) series.
- iv. In ARDL, all variables are assumed to be endogenous.

Co-integration testing among ME (Manufacturing exports) and FDI (Financial development index) involves the following steps:

At first, unrestricted error correction model is estimated. An ARDL representation of equation (3.2) can be specified as follows:

$$\Delta LME = \beta_0 + \sum_{i=1}^{q_1} \beta_1 LME_{t-1} + \sum_{i=0}^{q_2} \beta_2 LFDI_{t-1} + \theta_1 LME_{t-1} + \theta_2 LFDI_{t-1} + \varepsilon_t \quad (3.2)$$

Where,

LME is log form of manufacturers exports (% of merchandise exports) used as proxy of manufacturing exports.

LFDI is log form of financial development index used as proxy of financial development.

q_1 and q_2 are denoted as lag lengths.

ε_t is error term.

Δ is the difference operator.

Here, the null hypothesis of no co integration defined as $H_0 = \delta_1 = \delta_2 = 0$ is tested against the alternative hypothesis $H_1 = \delta_1 \neq \delta_2 \neq 0$ of co integrating relationship. The co-integration test is based on Wald statistics or F-statistics. The F-test has non-standard distribution. Thus, Pesaran et al. (2001) has proposed two critical values (upper bounds value and lower bounds value) for co integration test. If the obtained F-statistic value is higher than the upper critical bound value, alternative hypothesis of co-integrating relationship between variables will be accepted. If the F- statistic value is than the lower critical bounds, null hypothesis of no cointegration relation will be accepted. However, if F-statistic value lies between lower and upper bounds, then the test is said to be inconclusive.

If co-integration exists between the variables, coefficients and error correction model are estimated.

$$LME = a_0 + a_1 t + \sum_{i=1}^m a_i LME_{t-i} + \sum_{i=0}^p \phi_i LFDI_{t-i} + v_t \quad (3.3)$$

The auto regressive distributed lag model estimates $(P+1)^k$ number of regressions to obtain the optimal lags for each variable, where 'P' is the maximum lags to be used and 'k' is number of variables in the equation 3 (Shrestha and Chowdhury, 2005). The model is selected based on the SBC or AIC. SBC considers smallest lag length and AIC maximum lag length (Shrestha and Chowdhury, 2005). Once co-integrating relationship is obtained among variables, the long run and ECM estimates of the ARDL model are obtained.

3.5.5. Vector Auto Regressive (VAR) Granger Causality Block Exogeneity Test

The co-integrating relationship reveals the existence or non-existence relationship, but does not shows the direction of causal relationship between the variables. So, in order to know the direction of relationship between the manufacturing exports and financial development VAR Granger Causality block exogeneity test is employed in this study. The framework of this test is mentioned ahead:

If causality (or causation) runs from ME to FD, it takes the form,

$$\Delta LME_t = a + \sum_{i=1}^p a_i \Delta LME_{t-1} + \sum_{j=1}^q \beta_j \Delta LFDI_{t-j} + u_t \quad (3.4)$$

If causality (or causation) runs from FD to ME,

$$\Delta LFDI_t = a + \sum_{i=1}^r \gamma_i \Delta LFDI_{t-1} + \sum_{j=1}^s \delta_j \Delta LME_{t-j} + v_t \quad (3.5)$$

In the above equations (3.4 and 3.5),

LME is log of manufacturers exports (% of merchandise exports) used as proxy of manufacturing exports.

LFDI is log of financial development index used as proxy of financial development.

u_{it} and v_t are white noise residuals.

Lag lengths for each variable are p, q, r and s.

The null hypothesis that is tested in this case is that LME variable does not granger cause variable LFDI and variable LFDI does not granger cause variable LME. In this model, a significant F statistic (< 0.05) will show causation from LME to FDI and LFDI to LME (Hassapis et al. 1999). At last, diagnostic tests are performed in this study to check any misspecifications in models.

3.5.6. Diagnostic Tests

At last, some diagnostic tests are also performed to ensure that models are not misspecified. In this study, serial correlation, normality, heteroscedasticity and stability of the models is checked. To check the serial correlation LM test is applied. Heteroskedasticity of the model is checked by Breusch-pagan test. Normality of models is examined by Jarque-Bera test which is important to check the the problem

of spurious relation. At last, to evaluate the parameter stability of models CUSUM and CUSUMSQ are graphically plotted (Brown et al. 1975). Estimated parameters obtained from ESM model may not be stable. Hence, these unstable parameters may result in model misspecification which can provide bias results.

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.

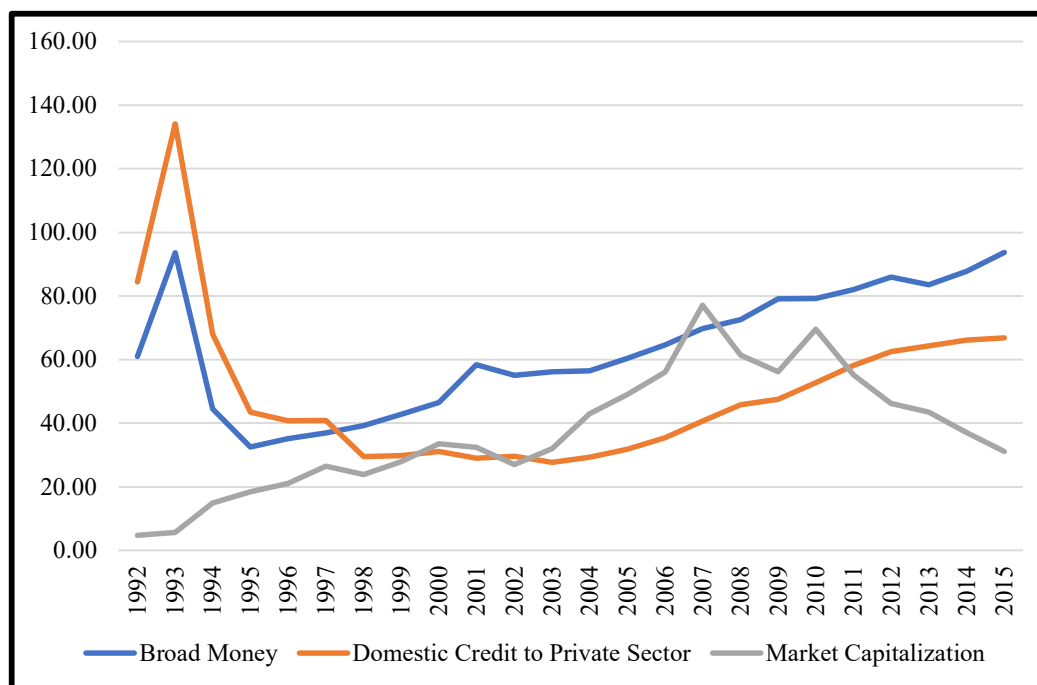


Figure 4.2.1.1: Financial Development Index Variables of Brazil (% of GDP).

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.

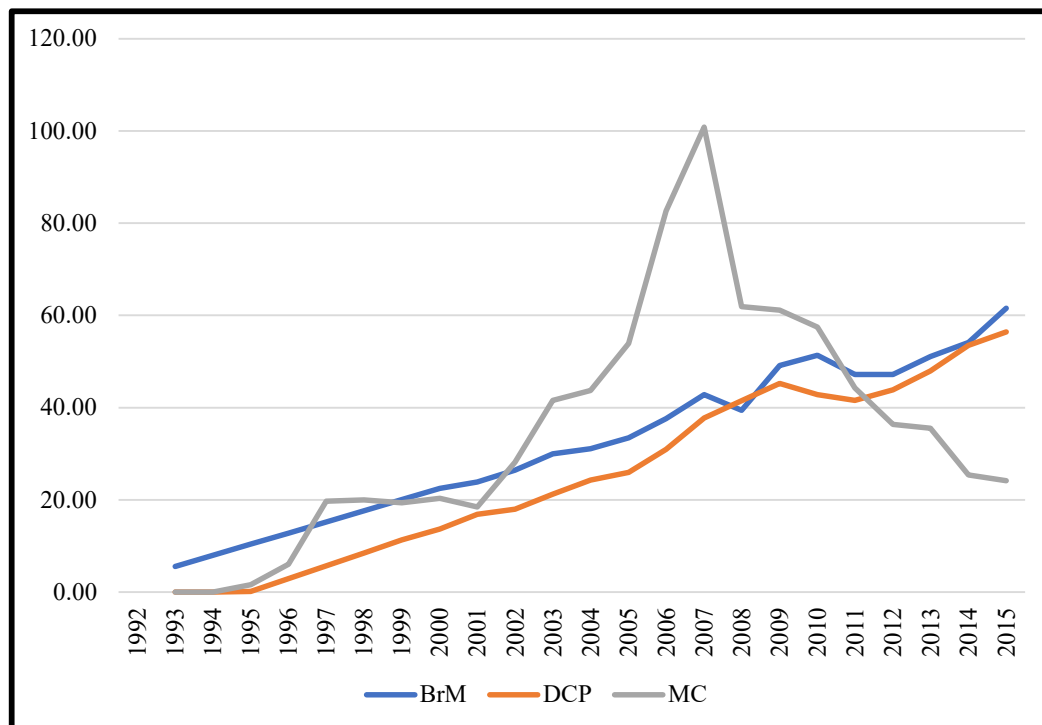


Figure 4.2.2.1: *Financial Development Index Variables of Russia (% of GDP).*

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.

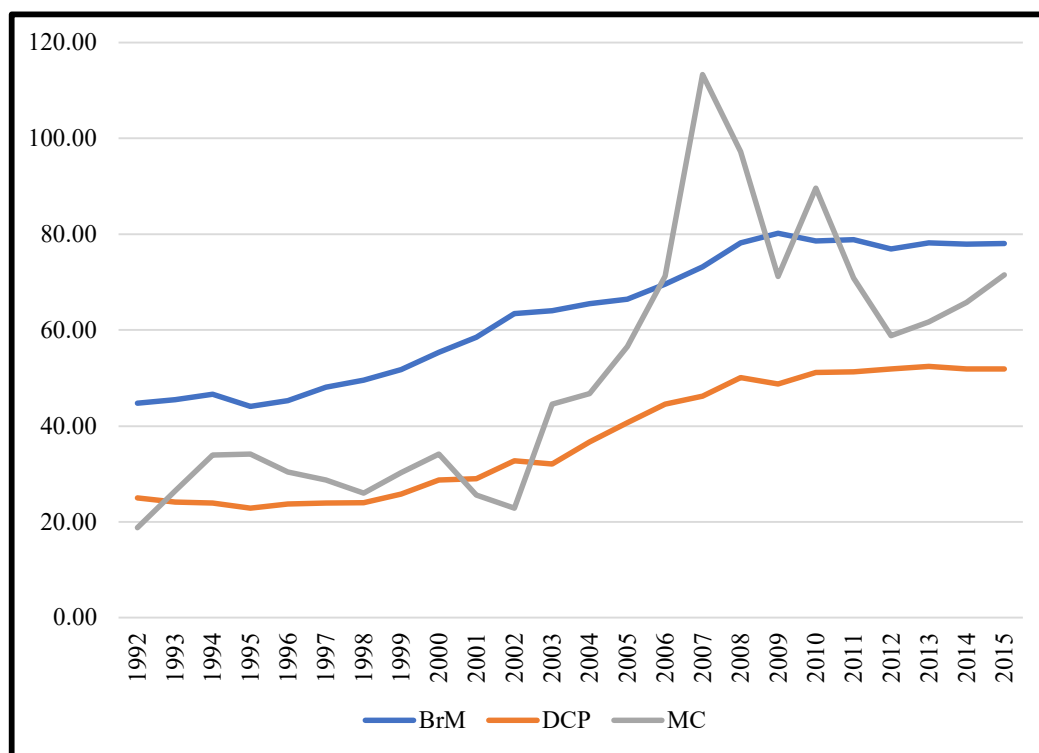


Figure 4.2.3.1: *Financial Development Index Variables of India (% of GDP).*

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

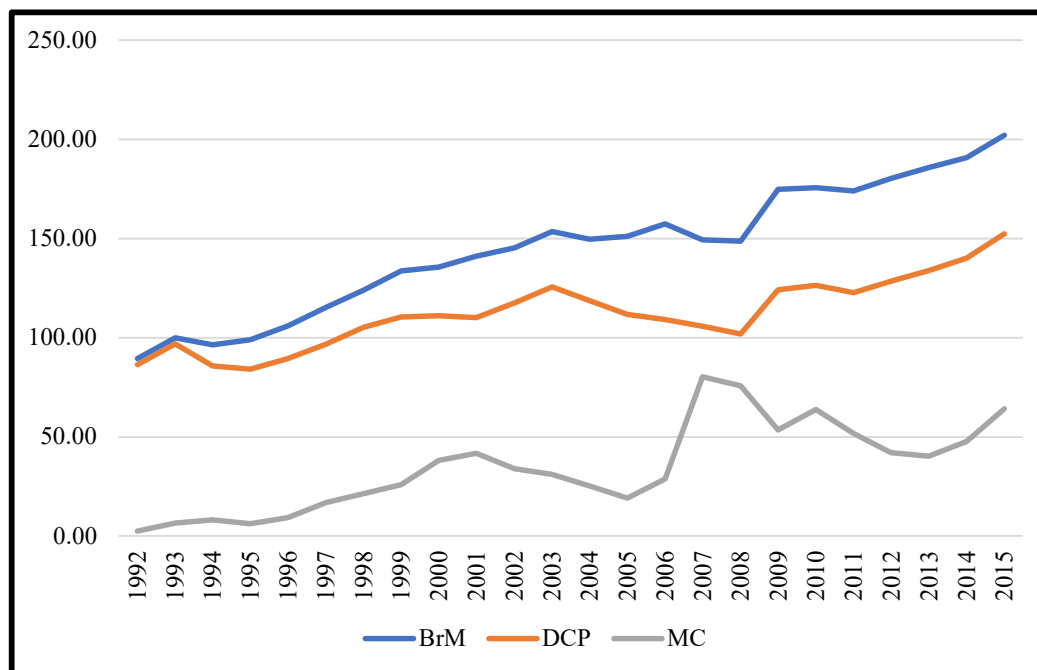


Figure 4.2.4.1: *Financial Development Index Variables of China (% of GDP).*

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

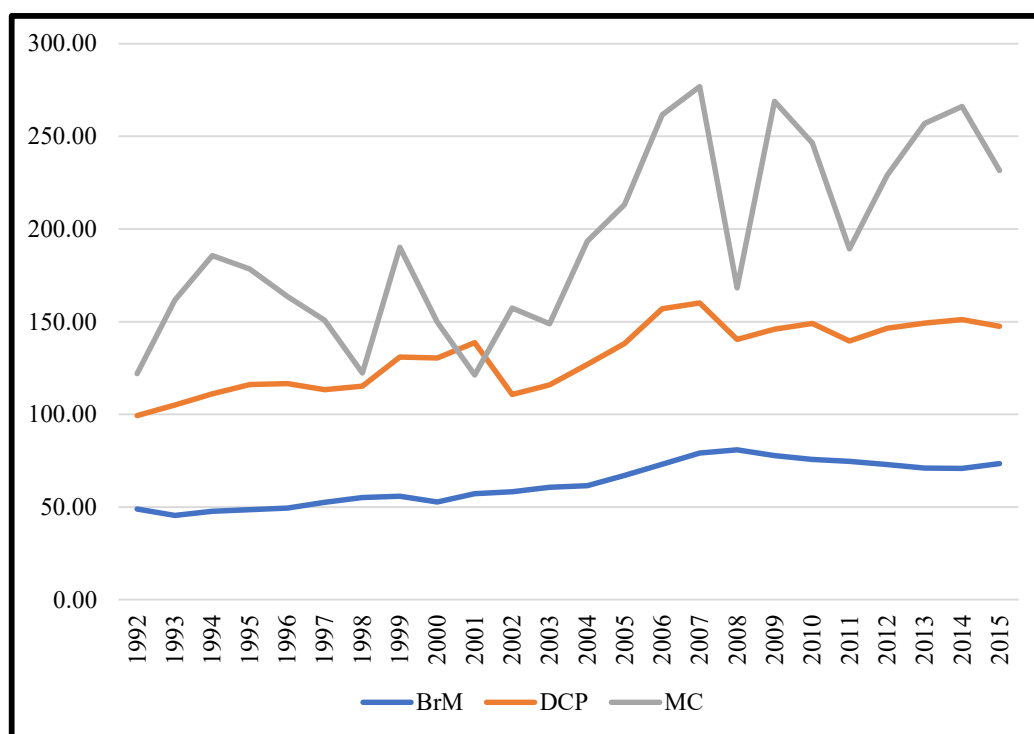


Figure 4.2.5.1: *Financial Development Index Variables of South Africa (% of GDP).*

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

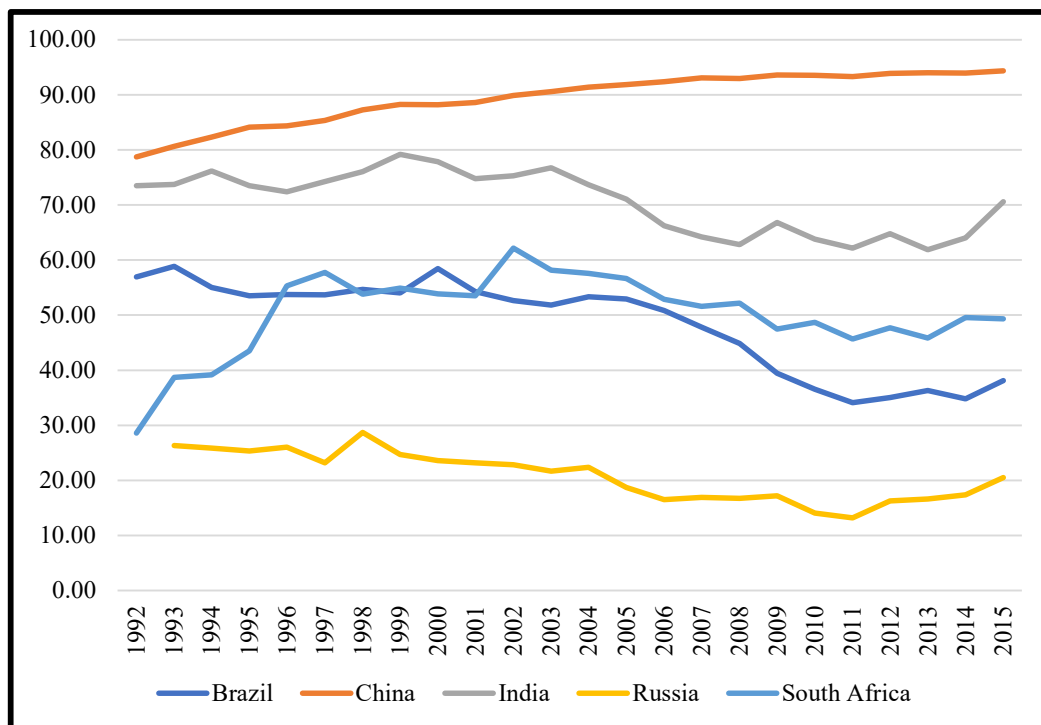


Figure 4.2.6.1: *Manufacturers Exports (% of Merchandise Exports) of BRICS Countries.*

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>					

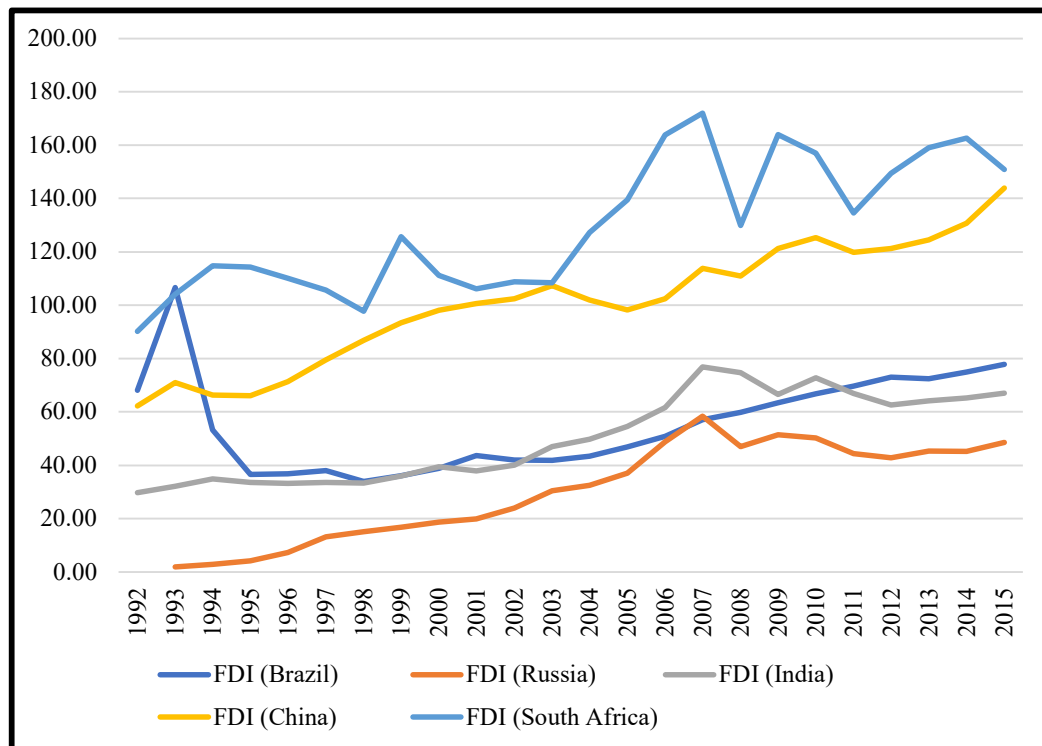


Figure 4.3.1: *Financial Development Index of BRICS Countries.*

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' trend and pattern also been different 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 e.g., financial development of South Africa is 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 rate and pattern over the study period.

CHAPTER 5

ROLE OF FINANCIAL DEVELOPMENT IN MANUFACTURING EXPORTS OF BRICS COUNTRIES

5.1. Introduction

In this chapter, an attempt is made to check the relationship between financial sector development and manufacturing exports of BRICS countries. Few other studies also studied the linkage between financial development and manufacturing exports. But unlike them, in this study financial development index is considered as a proxy of financial development whereas other researchers used only one variable as a proxy of financial development. The financial development index and manufacturers exports (% of merchandise exports) are considered as proxy of financial development and manufacturing exports respectively. In this study, manufacturing exports sector is selected because of its high economies of scale feature (Beck. T, 2001). To check the relationship between financial development and manufacturing exports a research process is followed. In this process, at first stationarity of data series is checked by applying ADF test. After checking stationarity of data series of variables, optimal lag length is selected with the help of optimal lag length selection criteria for each country's model. Based on unit root results and lag length selection criteria, bounds test for co-integration is applied to check the co-integration among exports of manufacturing goods and financial development in BRICS countries individually. After examining bounds test results, long-run and short-run coefficients are estimated with the help of ARDL model and directional causality is also checked among

financial development and exports of manufacturing goods. And at the end, diagnostic tests are performed to check any miss specifications in the model.

5.2. Unit Root Test Results (Augmented Dickey Fuller Test)

Table 5.2.1: ADF Test Results at level and 1st difference for Manufacturing Exports and Financial Development Index of Each BRICS Country.

Country	Variable	Level	1 st Difference
Brazil	LME	0.9227	0.0260
	LFDI	0.7707	0.0001
Russia	LME	0.5280	0.0010
	LFDI	0.0002	0.1853
India	LME	0.6241	0.0111
	LFDI	0.6007	0.0059
China	LME	0.0000	0.0041
	LFDI	0.8384	0.0003
South Africa	LME	0.5641	0.0000
	LFDI	0.4396	0.0001
<i>Authors' Computation with EViews 11.</i>			

Note-1: AIC is used for lag length selection.

Table 5.2.1 reports the results of the ADF test for the manufacturing exports and financial development index of BRICS economies with intercept at levels and the first differences. It is important to test the stationarity of each variable before the implementation of any other method as the results of stationarity test helps to decide future technique which can be implemented to check the relationship between variables e.g., if a series is stationarity at 1(2) then applying ARDL can give spurious results. So, stationarity test is applied to ensure that none of the series is not integrated of I (2) order. Here, the researcher has used Augmented Dickey Fuller (ADF) test to check the unit root in data series used in study. A stationary time series is the one, statistical properties of which mean, variance, and autocorrelation are all constant

over time. Values given in the above table are p -values. A p -value less than 0.05 means that time series is stationarity and a p -value above 0.05 denotes that a time series is not stationarity. Above stated results of ADF test shows that most of the data series are stationarity at I (1) orders, only LFDIR and LMEC are stationarity at I (0). Based on ADF test results, ARDL developed by Pesaran et al. (2001) and Johnson cointegration test are suitable for further analysis as none of the series is not stationarity at I (2) order. But as sample size of study is small (26 Years), in such case, ARDL method is more suitable. As bounds test for cointegration is more appropriated for small sample size. Bounds test for co-integration is first step of ARDL model. Before application of bounds test for co-integration adequate lag length of models is decided with the help of lag length selection criteria.

5.3. Lag Length Criteria Selection

Table 5.3.1: Lag Length Criteria Selection

Lag	Brazil	Russia	India	China	South Africa
0	-3.665766	-2.331366	-6.095001	-8.724302	-4.051687
1	-6.467447	-6.028404*	-9.254939*	-13.88805*	-6.606703*
2	-6.539974*	-5.714765	-8.963233	-13.60608	-6.364667
<i>Note: Values are of Akaike information criteria (AIC).</i>					
<i>Author's Computation with EViews 11.</i>					

In the above Table 5.3.1, lag length criteria selection results are presented. Deciding adequate lag length is also very important before finding out long run relationship among explanatory variables as it helps in removing serial correlation. The optimum lag length criteria selection results are based on the AIC criterion as its values are lowest among other criteria (Appendix G). Based on the above table it is clearly

visible that lag order 2 is appropriate for Brazil's model and lag order 1 is appropriate for Russia's, China's, India's and South Africa's model. For annual data, maximum of 2 lag lengths should be selected in ARDL model (Pesaran & Shin, 1988) and (Narayan, 2005).

5.4 Bounds Test Results

Table 5.4.1: Bounds Test Results between Manufacturing Exports and Financial Development Index of Each BRICS Country.

Country	Lower Bound I (0)	Upper Bound I (1)	F-Statistic
Brazil	3.62	4.16	0.92
Russia	3.62	4.16	1.72
India	3.62	4.16	2.96
China	3.62	4.16	89.91
South Africa	3.62	4.16	0.69
<i>Authors' Computation with EViews 11.</i>			

Note- Critical values are at 5% and Case 2.

Bounds test is the first step of ARDL model and this procedure of bounds test is based on F statistic or Wald test. The F test applied for this procedure has non-standard distribution. Two set of critical values which are computed by Pesaran et al. (1999, 2001) for a given significance level. One set of values assume variables as I (0) and other set assumes values as I (1). If the obtained F-statistic exceeds the I (1), in such a case null hypothesis of no cointegration will be rejected and if F- statistic value comes below the I (0) than null hypothesis of no cointegration will be accepted. In another case, if F- statistic value comes between upper bounds value and lower bounds value result will be inconclusive. So, in this study to check the existence of a co-integrating relationship between financial development and manufacturing exports of BRICS

countries bound test for co-integration is applied. And results of the bound test are presented in Table 5.4.1. In bounds test the equation is estimated with ‘Restricted Intercept’ as it is considered in Case 2 of Pesaran and Shin. Based on the bounds test results it is evident that financial development and manufacturing exports of China have co-integrating relationship as F-statistic is higher than I(1) at 5% critical value and other BRICS countries do not have any co-integrating relation between financial development and manufacturing exports as calculated F- statistic is lower than I(0) at 5% critical value. In case of no co-integrating relationship, long-run and short-run estimates are not possible among variables. Based on bound test for co-integration results, long-run and short-run estimates are estimated among financial development and manufacturing exports of China only, as other BRICS countries bounds test results show no co-integrating relationship among manufacturing exports and financial development. Long run and short run estimates are estimated below: -

5.5. Long Run Estimation of Relationship between Manufacturing Exports and Financial Development of China

Table 5.5.1: Long-run Estimates Based on AIC-ARDL (1,1) for the Study Period.

Variable	Coefficient	<i>p</i> -value
LFDI	0.13	0.00
C	1.68	0.00

Authors' Computation with EViews 11.

Note - Dependent Variable: LMEC

In Table 5.5.1, long-run relationship results between financial development and manufacturing exports are presented. *p*-value is 0.00 for both intercept and LFDI which shows that there is long run relationship between financial development and

manufacturing exports of China. The coefficient value of financial development is also positive which infers that 1 percent growth in financial development of China would imply 0.13 percent increase in manufacturing exports of China in long run. As per theoretical literature also, financial development increases the capacity of financial sector to supply funds to the industries for production which helps in exports of increased production capacity of industries specially in case of manufactures.

5.6. Short-Run Estimation of Relationship between Manufacturing Exports and Financial Development of China

Table 5.6.1: Error Correction Representation of Model (ARDL 1,1) for the Study Period

Variable	Coefficient	<i>p</i> -value
ECM (-1)	-0.31	0.0000
<i>Authors' Computation with EViews 11.</i>		

Dependent Variable: LMEC

$R^2 = 0.88$

DW: 1.63

In above Table 5.6.1, results of short-run dynamics of China are presented. It is important to investigate short run dynamics empirically for policy makers as the signs and magnitudes of short run dynamics provide movements and directions of the variables under consideration. In this study, short-run dynamics are estimated through ECM model. In short-run, error correction term (ECM-1) is statistically significant with – sign at 5% level of significance. This negative and significant coefficient is sign of co-integration among financial development and manufacturing exports of China. The ECM coefficient shows that convergence towards the long run equilibrium is slow. Based on bounds test result, it is proved that financial development and

manufacturing exports have co-integration. In long-run and short-run also results show that financial development and manufacturing exports share relationship between each other. But the direction of causality between financial development and manufacturing exports of China is still not known. To check the direction of relationship between financial development and manufacturing exports of China VAR granger causality test is performed and its results are presented ahead.

5.7. Direction of Causality between Manufacturing Exports and Financial Development of China

Table 5.7.1: VAR Granger Causality Test Results of LME and LFDI of China.

Null Hypothesis	Chi-sq.	<i>p</i> -value	Casual Relation
LFDIC does not Granger Cause LMEC	13.44	0.0002	FDIC Promotes MEC
LMEC does not Granger Cause LFDIC	1.31	0.2512	No Causality.
<i>Authors' Computation with EViews 11.</i>			

In Table 5.7.1 VAR Granger causality test results are presented. This test shows the direction of causality among variables. In this study, to check the direction of causality among the variables VAR Granger causality test is applied. If *p*-value in test is greater than 0.05 than null hypothesis (does not granger cause) is accepted and if it is smaller than 0.05 than null hypothesis (does not granger cause) is rejected. Based on the *p*-values given above, null hypothesis of financial development of China does not cause manufacturing exports of China is rejected which means that financial development of China promotes manufacturing exports of China. On the other side, null hypothesis of manufacturing exports of China does not Granger cause financial development of China is accepted which means that manufacturing exports of China

do not causes financial development of China. Results of VAR granger causality test are also supported by Pairwise Granger Causality Test (Appendix M). Based on Granger causality results, it can be said that financial development of China promotes manufacturing exports but manufacturing exports do not promote financial development of China which also proves the validity of supply side hypothesis. At last, for stronger validation of results some diagnostic tests are also performed on selected ARDL models. Diagnostic tests performed on the models are heteroskedasticity, serial correlation, normality test and stability test. And the results for these diagnostic tests are depicted ahead.

5.8. Diagnostic Test Results

The robustness of the results is investigated with the help of diagnostic tests. Serial correlation, normality and heteroscedasticity in the models are checked. CUSUM & CUSUMSQ test are applied against stability test. And the results of the same tests are presented below in a sequential manner.

Table 5.8.1: Serial Correlation Results of ARDL Models Used for BRICS Countries (LM Test)

Countries	<i>p</i> -value
Brazil	0.24
Russia	0.67
India	0.76
China	0.47
South Africa	0.55
<i>Authors' Computation with EViews 11.</i>	

5.8.1. Serial Correlation Test Results

In Table 5.8.1 results of serial correlation are presented. To check serial correlation LM test is applied. In LM test, if p -values are greater than 0.05 then we accept null hypothesis of no serial correlation among variables. And the results of this test shows that models are free from serial correlation as p -values are greater than 0.05.

Table 5.8.2: Normality Test Results of ARDL Models Used for BRICS Countries. (Jarque- Bera Test)

Countries	p -value
Brazil	0.90
Russia	0.79
India	0.53
China	0.30
South Africa	0.06
<i>Authors' Computation with EViews 11.</i>	

5.8.2. Normality Test Results

To check the normality of models Jarque-Bera test is applied and the results of the same are presented in Table 5.8.2. In the above table p -values are above 0.05 which means that models also pass the normality test.

Table 5.8.3: Heteroscedasticity Results of ARDL Models Used for BRICS Countries (Breusch – Pagan Test)

Countries	p -value
Brazil	0.63
Russia	0.71
India	0.32
China	0.25
South Africa	0.27
<i>Authors' Computation with EViews 11.</i>	

5.8.3. Heteroscedasticity Test Results

In Table 5.8.3 heteroscedasticity results are presented. To check heteroscedasticity Breusch-Pagan test is applied. In this test, if p -value is greater than 0.05 than null hypothesis is accepted which states that model is free from heteroscedasticity. And in case of this study, p -values are greater than 0.05 which means that models are free from heteroscedasticity.

5.8.4. Stability Test of Models

It is also very important to check the stability of models used in the study. In this study, to check the stability of models CUSUM and CUSUMSQ test (Brown et al (1975) are employed and the results of the same are enclosed in Appendices (Appendix P). This does not require structural break point like Chow test. Examination of plots shows that statistics of these test are within 5% critical bounds which implies that long-run and short-run coefficients of ARDL-ECM model are very stable. It is also evident form CUSUM and CUSUMSQ test that models do not suffer from any structural instability over the study period.

5.9. Conclusion of the Chapter

In this chapter, an attempt is made to check the relationship between financial development and manufacturing exports of each BRICS countries. In this process of examining ADF test is applied to check the unit root in time series of variables. After ADF test results, lag length of models is decided. Based on ADF test results and sample size ARDL model is selected to examining this relationship between variables. Next bounds test for co-integration (ARDL model) test is applied to check the co-

integration between financial development and manufacturing exports of BRICS countries. Results of bounds test for co-integration reveals that only China's financial development and manufacturing exports have co-integration, remaining BRICS country's financial development and manufacturing exports do not have co-integration. Based on bounds test results, long-run and short-run estimates (ARDL model) were estimated to check the long-run and short-run relationship between financial development and manufacturing exports of China and results of long-run estimates and short-run estimates supports the result of bounds test that financial development and manufacturing exports of China also have a significant and positive relationship in long-run and short-run. After estimating long-run and short-run estimates, direction of causality is also checked with the help of VAR Granger causality test and results of this test show that financial development of China promotes manufacturing exports of China. At last, in this chapter, some diagnostic tests were performed to check any misspecifications in the selected ARDL models and diagnostic test results shows that model does not suffer from any misspecification.

CHAPTER 6

CONCLUSION, FINDINGS, POLICY IMPLICATIONS, LIMITATIONS AND FUTURE SCOPE OF THE STUDY

6.1. Conclusion of the Study

In present study entitled ‘Role of Financial Development in Trade of Manufacturing Goods of BRICS Countries’ put an exclusive attempt to examine the role of financial development in exports of manufacturing goods of BRICS Countries. But prior to examining this role, an attempt was also made to measure the level of financial development of BRICS countries. In this study, three objectives were set and successfully achieved. The first objective of the study was to analyze trend and pattern of all variables used in the study. Second and third objective of the study were to construct the financial development index of BRICS countries and to examine the role of financial development in exports of manufacturing goods of BRICS countries respectively.

Therefore, firstly, trend and pattern of all variables used in the study was analyzed with the help of simple line chart. The line charts show that variables of financial development have improved over the study period of each BRICS countries. But this improvement did not occur smoothly as some variables improved with minor fluctuations and some have suffered very high fluctuation during the study time period. On the other side, manufacturing exports of Brazil, Russia, India and South

Africa have decreased and only China' manufacturing exports have increased over the study period.

Secondly, to measure the financial development of BRICS countries a financial development index of each BRICS country was constructed by applying PCA approach. While constructing financial development index three variables were considered namely market value of domestic listed companies as percentage of GDP, domestic Credit to private sector as percentage of GDP and broad Money as percentage of GDP. And PCA approach was used to construct index. Results of financial development index reveal that financial development of South Africa is highest among BRICS countries during study period, which is followed by China. Russia's financial development index value are lowest among BRICS countries during study period and the pattern of financial development index of Brazil and India is very similar to each other except few initial years of the study period. Financial development of China made highest growth among BRICS nations. Financial development of each BRICS country increased over the study period but the rate and pattern of growth is different for each country.

And finally, the role of financial development in manufacturing exports of BRICS countries was analyzed with the help of ARDL model. To examine it, empirical analysis was done with a set of procedures. In that process, at first, stationarity of data was checked and based on stationarity results, ARDL model was selected to check the relationship between financial development and manufacturing exports of BRICS countries. Bounds test for co-integration (ARDL model) results revealed that that only

China's financial development and manufacturing exports have co-integration, and in other BRICS countries financial development and manufacturing exports do not have co-integrating relationship. Long-run and short-run estimates (ARDL model) of China also show significant and positive relationship. To check the direction of causality between financial development and manufacturing exports of China VAR Granger causality test was applied and result of the same revealed that financial development of China promotes manufacturing exports of China. At last, diagnostic tests proves that model don't suffer from any misspecifications.

Based on study results of the study, it is evident that among BRICS countries only in China financial development promotes manufacturing exports. So, it can be said that one of the important reason for China's success in manufacturing sector is China's financial sector development. While developing financial sector, China has focused so much on pooling of savings from household through banking system and diverting them towards the manufacturing sector (Chenn, 2003). China also focused on increasing intermediation efficiency which also helped in channelizing more funds towards the manufacturing sector. Other BRICS countries governments should learn from China's government and they should also put financial sector development on policy makers agenda to boost manufacturing exports of country.

6.2. Findings of the Study

The findings of the study are very mixed in nature, few of them are very shocking and interesting in nature and few others also validate few studies. Based on the study conducted, major findings identified, are mentioned below:

- 1) In this study, three variables namely domestic credit to private sector (% of GDP, market capitalization (% of GDP) and broad money (% of GDP) are considered to construct the financial development index of BRICS countries. During trend and pattern analysis of these three variables of financial development index, it is found that market capitalization is highly volatile for most of the BRICS countries due to sub-prime crisis. Domestic credit to private sector (% of GDP) and broad money (% of GDP) also increased for all BRICS countries but at different pace.
- 2) In this study, manufacturers exports (% of merchandise exports) is used as a proxy of manufacturing exports for the BRICS countries. While looking at the trend of manufacturing exports in BRICS countries, it is found that only China's manufacturing exports increased during the study period. In remaining BRICS countries (Brazil, Russia, India and South Africa), manufacturing exports declined over the study period.
- 3) Based on financial development index results, it is evident that financial development of all BRICS countries has improved over the study period. But the growth rate and pattern of financial development are different for each country. Among BRICS countries, financial development of China increased

most and in smooth manner. Financial development of South Africa increased in most volatile manner. Russia's financial development is lowest among BRICS nations. And financial development of Brazil and India are very close and similar to each other during most years during the study period.

- 4) Bounds test of co-integration results revealed that there is co-integration between financial development and manufacturing exports of China, which also validates the supply side hypothesis. In case of remaining BRICS countries, co-integration does not exist between financial development and manufacturing exports.
- 5) Long run and short run estimate results also revealed that financial development and manufacturing exports of China have significant and positive relationship in both long-run and short-run.
- 6) Based on direction causality test results, it is found that that there is unidirectional relation between financial development and manufacturing exports of China. And the direction of causality is that financial development of China promotes manufacturing exports of China, which validates the supply side hypothesis.

6.3. Policy Implications of the Study

The findings of the present study have interesting policy implications. As financial development plays significant role in the manufacturing exports in the given circumstances. Therefore, the variables which determines the level of financial development in an economy must be taken care of during the policy formulation. In the view of this and on the bases of present study, the researcher suggests following measures that can be adopted and implemented:

- 1) Based on PCA results, it is evident that all the three variables of financial development play a significant role in financial sector development of BRICS nations. So, the government of BRICS nations should focus with balanced approach while developing financial sector as both the sources (stock market and banking system) are equally major sources of capital financing for the firms.
- 2) A standard financial development index can be developed for all countries as till now there is no standard financial development index is developed for the world economies. A standard financial development can help to understand financial development of a country. A standard financial development index can also make financial sector development comparison easier and better.
- 3) Reduced transaction and monetary costs and a well-developed financial system enhance intermediation efficiency (Pagano, 1993) which in result causes better allocation of funds to mainly manufacturing sector and leads to growth of this sector. In case of China, it seems valid. So, while improving financial development cost reducing factors should be kept in mind.
- 4) China has attained this financial depth because of expansion of household savings and monetization of economy (Chenn, 2003) and these pooled savings

are main source of bank loans. Other BRICS countries should also focus on expanding household savings which can lead to increased channeling of funds to manufacturing sector.

- 5) Decentralization of power to local bodies can help a country to produce manufacturing goods in better ways as regional governments are more aware of local issues and can process information better than center and it also allows institutional changes on experimental scale, thus protects rest of the economy from disruption (Xu, 2011). Decentralization of power to local bodies can also help in increased competition among local bodies and which can be vital in attracting FDI and introduce some other innovative (Jun et al., 2007). China has applied this decentralization of power policy for manufacturing sector and gained success too with it. So, other BRICS countries can also adopt this policy as it can help in attaining success in this sector.
- 6) One of the reasons for China success in manufacturing exports is setting up of mega SEZs for attaining advanced technology and FDI which also made use of China's abundant labor. SEZs have a vital role in converting China into trade surplus nation as more than 95 percent of China's exports come from SEZs. So, following China's footsteps remaining BRICS countries also can set up more and mega SEZs with flexible labor laws and FDI focused.
- 7) Like China, Other BRICS countries should also focus more on attracting FDI in manufacturing sector as FDI can have positive spillovers in many ways over a long period of time. FDI gets attracted with better physical infrastructure, less bottlenecks for FDI and trade openness (Seekat and Varoudakis, 2007).

6.4. Limitations and Future Scope of the Study

Although the objectives of this study have been fulfilled, but still there are certain areas which can be addressed in future research and which are limitations of this study. Some limitations of this study are mentioned below:

- 1) This study is conducted on post economic reforms period in BRICS countries. Further study can be conducted in pre-economic reforms period also.
- 2) Time period of the study is 26 years which is a small sample size. Data series can be extended for further study.
- 3) To measure the financial development only three indicators were considered in this study but practically financial development is very broad in nature and more variables are needed to get the exact picture of financial development. For future research a financial index can be constructed by considering greater number of financial sector variables.
- 4) In this study, effect of financial development is checked on manufacturing exports only. To know the exact effect of financial development on trade of manufacturing goods, effect of financial development should also be checked on manufacturing imports. So, for further research effect of financial development can also be checked on manufacturing imports also.
- 5) In this study, only five countries are considered. In future, this study can be done on more number of countries.

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