"The Impact of Capital Markets on the Economic Growth: A Comparative Study of India and South Africa"

Project Report Submitted to

Chhatrapati Shahu Institute of Business Education & Research
(An Autonomous Institute)

As a Partial Fulfilment for the Award of the Degree of

MASTER OF SCIENCE
IN QUANTITATIVE ECONOMICS

By

Mrs. Akimana Charnie

UNDER THE GUIDANCE OF

Dr. V. Ravi Kishore Kumar
M.A. (Q.E), M.Phil., Ph.D.

KOLHAPUR

Through
Department of Economics
Chhatrapati Shahu Institute of
Business Education & Research, Kolhapur
(An Autonomous Institute)
2020-21

"The Impact of Capital Markets on the Economic Growth:

A Comparative Study of India and South Africa"

Project Report Submitted to

Chhatrapati Shahu Institute of Business Education & Research

(An Autonomous Institute)

As a Partial Fulfilment for the Award of the Degree of

Master of Science in Quantitative Economics

By

Mrs. Akimana Charnie

UNDER THE GUIDANCE OF
Dr. V. Ravi Kishore Kumar
M.A. (Q.E), M.Phil., Ph.D.

Through

Department of Economics

Chhatrapati Shahu Institute of Business Education & Research, Kolhapur

(An Autonomous Institute)

A Comparative Study of India and South Africa"

Project Report Submitted to

Chhatrapati Shahu Institute of Business Education & Research

(An Autonomous Institute)

As a Partial Fulfilment for the Award of Degree of

Master of Science in Quantitative Economics

By

Mrs. Akimana Charnie

UNDER THE GUIDANCE OF
Dr. V. Ravi Kishore Kumar
M.A. (Q.E), M.Phil., Ph.D.

Through

Department of Economics

Chhatrapati Shahu Institute of Business Education & Research, Kolhapur

(An Autonomous Institute)

2020-21

Certificate

This is to certify that the project report entitled, "**The Impact of Capital Markets on the Economic Growth: A Comparative Study of India and South Africa**", is a bonafied work prepared by Mrs. Akimana Charnie as a partial fulfilment for the award of degree of Master of Science in Quantitative Economics, submitted to Chhatrapati Shahu Institute of Business Education & Research (CSIBER), Kolhapur, and has been completed under my supervision and guidance.

To the best of my knowledge and belief, the work reported in this dissertation is authentic and is not reproduced from any source.

Place: **Dr. V. Ravi Kishore Kumar**

Date: Kolhapur   **Project Guide**

CSIBER, Kolhapur

DECLARATION

I, the undersigned, hereby declare that the project work entitled, "**The Impact of Capital Markets on the Economic Growth: A Comparative Study of India and South Africa**", written and submitted by me as partial fulfilment of the award of the degree of Master of Science in Quantitative Economics under the guidance of Dr. V. Ravi Kishore Kumar, is original work.

The matter submitted in this report has not been copied from any other source and it is an independent write up. I understand that any such copying is liable to be punished in any way the authorities deem fit.

Place:

Date: Kolhapur   27/08/2021

Mrs. Akimana Charnie

Forwarded Through

Chairman/HoD

Msc. Q.E. Programme

External Evaluator

Director

CSIBER

DIRECTOR
Chhatrapati Shahu Institute of Busi
Education and Research,
Kolhapur - 416 004

CSIBER, Kolhapur

Acknowledgement

It is with great pleasure to acknowledge here the assistance extended by various persons in the completion of my studies. I wish to express my sincere gratitude to my Research Guide Dr. V. Ravi Kishore Kumar, Assistant Professor, Department of Economics at CSIBER INSTITUTE, Kolhapur who took the responsibility to guide me in my research and has been practical in fortifying basic issues with the help of his knowledge. His valuable guidance and inspiration in my report project were of immense help to me.

I wish to express my gratitude to Dr. R. A. Shinde, Managing Trustee, CSIBER, Dr. C. S. Dalvi, Director, CSIBER, Dr. T.V. G. Sarma, HOD, Department of Economics and all professors of this institute as well as staff members and all research scholars in the Department of Economics at CSIBER INSTITUTE, Kolhapur. I am indeed grateful to all members of faculties and library staff for their kind cooperation.

Last but not least, I wish to express my gratitude to my husband, my parents and family members who have been the constant source of inspiration, motivation and encouragement for me throughout the completion of this work. I also thank friends and all people who helped me directly or indirectly to complete my Research work.

Mrs. Akimana Charnie

CONTENTS

Table, Graphs and Interpretation Contents

	Output of time series plot of South Africa Stocks Traded Value in billion U.S. dollars	32 - 33
Table and Interpretation	Table 1. ADF unit root test for variables at levels and 1st difference (India)	34 - 35
	Table 2. ADF unit root test for variables at levels and 1st difference (South Africa)	35

Chapter-I
Introduction and Research Methodology

1.1. Introduction

Capital markets have globally played a major role in influencing the outcomes and effectiveness of the overall economy. Ekundayo (2002) suggests that, in order for a nation to reach a sustainable economic growth and development, it would need huge volumes of investments both locally and internationally. That is why we need to study how capital markets can help a nation to achieve that. In this study, two countries have been selected, i.e. India and South Africa with their respective capital markets: Bombay Stock Exchange (BSE) and National Stock Exchange (NSE) in India, and Johannesburg Stock Exchange (JSE) in South Africa.

The Indian Bombay Stock Exchange (BSE) is amongst the top 10 oldest stock exchanges in the entire world. It was established in the year 1875. The Indian National Stock Exchange (NSE) was incorporates in 1992 and recognised as a stock exchange by Securities and Exchange Board of India (SEBI) in April 1993. The NSE is the leading government owned stock exchange of India. It is the first exchange in the country to provide a modern, fully automated screen-based electronic trading system that offered easy trading facilities to investors. National Stock Exchange of India ranks as the tenth in the largest stock exchange operators worldwide by market capitalization of listed companies (as of February 2021) with market capitalization value of 2.56 trillion U.S. dollars.

South Africa, being the third largest economy in Africa, after Nigeria and Egypt, has the largest stock market in Africa, the Johannesburg Stock Exchange (JSE), which was formed in 1887. The JSE joined the World Federation of Exchange (WFE) in 1963 and upgraded to an electronic trading system in the early 1990s. Johannesburg Stock Exchange of South Africa ranks as the eighteenth in the largest stock exchange operators worldwide by market capitalization of listed companies (as of February 2021) with market capitalization value of 1.13 trillion U.S. dollars.

Comparing the impact of capital markets on the economic growth of the above two countries could bring some light in the manor that the economy of a country is affected by the presence of capital markets.

1.2.   Statement of the Problem

The problem under study is to analyse how capital markets can impact a country's economic growth. It will be a comparative study of two countries, i.e. India and South Africa, to understand how the presence of capital markets in these countries contribute in their economic growth.

1.3.   Objectives

The objectives of the study will be as follow:

1. To understand the trends in India and South Africa growth performance from 2000-2020.
2. To study the performance of capital markets in India and South Africa during the study period.
3. To assess the relation between capital markets and a country's economic growth during the study period.
4. To identify the suggestion areas for a better policy environment.

1.4.   Scope

This study will simultaneously look at the evolution of economic growth of India and South Africa. It will enlighten the impact of Gross Domestic Product on both countries' economy. It will also explore the contribution of capital markets on economic growth of those countries and compare their trends.

In fact, the study is going to cover comparatively the trends between India and South Africa in their respective Gross Domestic Product with some capital markets indicators. It will focus on how the Gross Domestic Products of those two countries are affected by the selected capital markets variables to determine its impact in their respective economic growth.

1.5. Research Design

In this study, the researcher will analyse a data set of information that has already been collected. The data type will be secondary sources gathered from various websites, articles, books, publications, and research documents created by others on their respective researches in different areas.

The researcher aims to find out similarities and differences in the economic trends of India and South Africa with the help of the following hypotheses:

1. H0: Gross Domestic Products of India and South Africa do not significantly affect their economy

    H1: Gross Domestic Products of India and South Africa significantly affect their economy

2. H0: Gross Domestic Products of India and South Africa do not remarkably depend on their capital markets

    H1: Gross Domestic Products of India and South Africa remarkably depend on their capital markets

3. H0: There is no impact of capital markets performance on a country's economic growth

    H1: There is an impact of capital markets performance on a country's economic growth

The study will be based on the annual time series data from 2000 to 2020. The variables under study will be: Gross Domestic Product, Market Capitalization, Stocks Traded Value, and Exchange rate. The economic growth of a country can be analysed through its Gross Domestic production which is the reason why the GDP variable was selected and the exchange rate variable was chosen because it is one of the most important determinants of a country's relative level of economic health. Capital Market here is represented by the Stocks Traded Value to see the total value of shares traded during the study period (2000-2020), and Market Capitalization to help in evaluating the value of companies.

The data set under study was collected in the following manner:

- India GDP data was obtained from the historical data on Macrotrends website, a Research Platform for Long Term Investors.
- South Africa GDP data was collected from Statista website, a Business Data Platform.
- India and South Africa Exchange Rate data were obtained from the Open Financial Exchange (OFX), an online money transfer provider that delivers to more than 190 countries from the U.S. via its website and mobile application.
- India and South Africa Market Capitalization and Stocks Traded Values were collected from the World Development Indicators (WDI) which is a World Bank's compilation of cross-country comparable data on development.

Market Capitalization, Stocks Traded Value and Gross Domestic Product are collected in billion U.S. dollars while Exchange Rate is collected based on the value of 1 unit of USD into X units of the respective currencies of India and South Africa, i.e. INR and ZAR. The standard equation based on these variables is expressed as follows:

$$GDP = f(MCAP, STVL, EXCHR) \tag{1}$$

Where,

GDP = Gross Domestic Product (factor of economic growth),

MCAP = Market Capitalization,

STVL = Stocks Traded Value, and

EXCHR = Exchange Rate.

A detailed form of equation (1) will be as follows:

$$GDP_t = \beta_0 + \beta_1 MCAP_t + \beta_2 STVL_t + \beta_3 EXCHR_t + \mu_t \tag{2}$$

In the above equation, β_0 represents the intercept or constant of the relationship in the model where β_1, β_2 and β_3 are coefficients of each of the independent variables and μ is the stochastic or error term. The linear representation of the equation (2) expressed as logarithms will be as follows:

$$Log(GDP_t) = \beta_0 + \beta_1 Log(MCAP_t) + \beta_2 Log(STVL_t) + \beta_3 Log(EXCHR_t) + \mu_t \tag{3}$$

The functional models which will be used for analysis of the above study variables will be the Vector Error Correction Model (VECM) and Vector Autoregressive (VAR) model along with other statistical tests such as unit root test to check whether the data series are stationary, the Johansen cointegration test, and the Granger causality test.

1.6. Limitations

1. The research findings are limited to the study period of 2000-2020.
2. The study relation is limited to the study variables only.

1.7. Chapter Scheme

The research study is divided into four chapters as follows:

Chapter 1

The first chapter, *Introduction and Research Methodology*, includes the introduction of capital markets of India and South Africa along with their respective economic evolution and current situations. Then, the chapter discuss the statement of the problem to show why the researcher has selected to go with this study. Next, objectives and scope of the study are specified. After that, the chapter shows the research design whereas data types, hypotheses, research period and variables are mentioned. Furthermore, limitations of the study are also given.

Chapter 2

In the second chapter, i.e. *Literature Review*, literature regarding the past research studies on capital markets in India and South Africa will be depicted in accordance to the objectives of the study. Studies on the importance of Gross Domestic Product in a country's economic growth, the impact of capital markets on a country's Gross Domestic Product and gaps in past research will be identified. Last but not least, the models to be used in the study will be mentioned.

The authors who will be mentioned have covered different topics such as capital market instruments, the concept of stock market, Indian Financial System, exchange rates between different currencies, changes brought by liberalization in India, African stock exchanges, link between GDP Growth of a country and Equity Returns, and how policy changes in a country could impact capital market development, growth, and poverty alleviation.

Chapter 3

The third chapter will be, *Theoretical Background*. This chapter will provide information of the study's theories regarding capital markets and the backgrounds of the capital markets in India and South Africa. There will be a comparison of the two countries GDP to see their trends over the years.

Chapter 4

The fourth chapter, *Data Analysis and Interpretation*, will provide analysis of the time series data using the R software and interpretations will follow each output. Furthermore, the chapter will conclude by stating in brief what will be found in the data analysis and the following findings will be discussed in the last chapter.

Chapter 5

In the final chapter, *Findings, Suggestions and Conclusion*, a summary of the results, findings and their interpretation will be enlisted. Then recommendations to overcome the challenges determined in the study will be provided. Furthermore, the chapter will conclude by stating the contributions and limitations of the study together with the future prospects of the research. References will follow this chapter.

Chapter-II

Review of Literature

2.1. Introduction

Capital markets are venues where savings and investments are moved between the suppliers having a capital and those who are in need of the capital. In capital markets, there are different activities done such as transactions managed by entities within the financial sector.

However there are risks associated with those transactions but there exist financial instruments, a form of contract between the parties holding a capital, to facilitate the transactions in all the different steps as per the involved parties' requirement.

Therefore, the researcher will present, in a chronological order, various findings and observations made by authors under their respective research topics.

2.2. Literature review

2.2.1. (Irrinki, 2019)**:**

Capital markets facilitate corporates to borrow and lend funds. In a developing country like India, the foreign institutional investors play a considerable role in developing the nation by putting their money in different financial markets. In this study, the author wanted to highlight the importance of capital markets, its structure and role in India, and the impact of foreign investors in the Indian capital market. The author has elaborated on the main capital market instruments available in India (i.e. Equity Shares, Debentures, Bonds, etc.) and how the country's growth attracted foreign investments.

The author concluded by giving the following suggestions that new technologies should be put into place despite the advancements in Indian capital markets, investors' confidence and a consistent policy should be maintained, investments should be held for a certain period to maintain the market stability, creative capital market instruments should be developed, and trading barriers should be removed.

2.2.2. (Jacob, 2017)**:**

Reform processes usually improve economic scenarios if they are well executed. The reform process in India intended to accelerate the pace of economic growth and remove at a certain level poverty. The process started in 1991 when the government introduced an open economy to market forces, private sector including foreign investment and a restructuring of the government's role. In this paper, the author gave a brief context of reforms in India and what was their purpose.

The author proceeded by introducing the concept of stock market and how it can be used as a mean of evaluating a country's economic health. The Sensex data used were collected from the Bombay Stock Exchange Historical Database and SEBI Annual Reports. The author has mentioned that economic reforms stir up a close relationship between stock market volatility and economic growth and stated some of the significant events and trends of Bombay Stock Exchange SENSEX from the year 1990 such as when Sensex reached the 30,000 mark with market capitalization value of Rs 1 lakhs crores as on 4th March 2015. The author concluded by showing that economic reforms have had a positive effect on the Indian stock market with a GDP growth from 1.43 in 1991-92 to 9 in 2009-11.

2.2.3. (Rubani, 2017)**:**

Financial systems are expected to provide in an organized manner a way of capital formation through savings, finance and investments, which can develop a country's economy. In this paper, the author studied the structure of financial markets and the functions of capital markets in India. The author has classified Indian Financial System into two main parts, namely:

- The institutions and regulators in the field of banking sector and other related services (examples of banking institutions in India are: Reserve Bank of India, Public, Private, Cooperative and Foreign Banks); and

- The institutions and regulators in the financial market field (i.e. Money Market and Capital Market), where Money Market include financial instruments having a short life period of less than one year (examples: Treasury Bills, Commercial Paper, Certificate of Deposit and Call Money) and Capital Market include Primary Market (also known as IPO market which raises owner's equity and fresh shares to issue) and Secondary Market (also known as stock exchange,

where issued shares are traded through different stock exchanges platforms like National Stock Exchange and Bombay Stock Exchange, two main stock exchanges in India) .

The author has concluded by observing how the demand of foreign currencies and financial instruments has significantly increased in India due to the globalization and liberalization reforms and the volume of international trade and business has gone up which has facilitated investors ready to take risk to gain huge profits.

2.2.4. (Tlegenova, 2015)**:**

In capital markets, when one country trades a foreign country, the concept of exchange rate has to be taken into consideration as the two countries might not be using the same currencies. In this paper, the author studied the yearly exchange rates between four different currencies, namely American dollar (USD), the Kazakh tenge (KZT) used in Kazakhstan, the euro (EUR) and the Singapore dollar (SGD). The study period was from 2006 to 2014 and the author has used ARIMA model for forecasting of yearly exchange rates of USD currency against KZT currency, EUR against KZT and SGD against KZT.

The data series were collected from the National Bank of Kazakhstan and the author checked the accuracy of the forecast in comparison with Mean Absolute Error (MAE), Mean Absolute Percentage Error (MAPE) and Root Mean Squared Error (RMSE) for further analysis. The MATLAB software was finally used to forecast the exchange rates of KZT currency against USD, EUR and SGD currencies and the author found that the MAPE values of those three currencies were the most efficient because they were the smallest values.

2.2.5. (Queen Sarah Khetsi, 2015)**:**

Capital Markets are institutions that have an important impact on the development of a country's economy but there exist some risks associated with all the transactions made. In this study, the authors investigated the impact of capital markets on economic growth in South Africa from 1971 to 2013. The authors used secondary data collected from the Quantec data warehouse and the South African Reserve Bank.

The variables under study were expressed in the equation $GDP = f(MCAP, VLT, EXCHR)$, where GDP is Gross Domestic Product, $MCAP$ is Market Capitalization, VLT is the total value

for transactions, and *EXCHR* is Exchange rate. The authors have used statistical tools and econometric models for analysis such as unit root test, cointegration test, Vector Error Correction Model (VECM) and Granger causality test. After the data analysis, the authors found that, although South Africa is one of the fastest growing countries in Africa and the world, the lack of facilities such as stability in the macro economy, developed financial systems and political stability, among other factors, hinders any progress to the economic growth of South Africa.

However, the empirical reviews revealed that there is in fact a positive relationship between economic growth and capital markets in South Africa. For this reason, the authors have suggested that the country should look more into factors that can lead to the development of capital markets, such as the development of financial institutions.

2.2.6. (Nanda, 2015)**:**

In this paper, the author studies on the reforms of the financial sector in India before and after the liberalization period, then analysed how financial market development could lead to India's economic growth and how effective are the steps taken by the government to improve the country's economy after the period of liberalization occurred. The author has discussed on how liberalization took place in India and positive changes like open economy, integration of international financial markets, allowing domestic companies to access foreign capital markets and so many others were introduced due to the reforms.

 In the early 1990's, when the liberalization took place, India's financial markets started the journey of transformation and growth with new reforms in the banking sector like Interest Rate Deregulation, Reduction in Statutory Pre-emption, and Ownership Structure and Opening up to private sector, where Indian banking system experienced remarkable changes and profit increase of commercial banks in particular. Then the author elaborated on reforms noticed in the capital markets in India such as Market Pricing of Issues, Creation of the Regulatory Bodies, introduction of Open Electronic Limit Order Book Market, Capital from Abroad as well as Foreign Portfolio Investment, Corporate Debt, and so many other reforms.

The author concluded by observing that India's capital market grew rapidly since the liberalization in 1991 and financial sector enhancement has influenced the country's economic growth and development.

2.2.7. (Aderibigbe Temitope James, 2015)**:**

Africa is a continent which is still not quite understood by the rest of the world. Some people still imagine Africa not as a continent but as a country not developed, sustaining mainly through foreign aid, having huge rates of conflicts and corruption. Even if there might be some truth to that, which might even be the same situation in some ways to other parts of the world, Africa as a continent of 55 different countries has potential and growing investment opportunities that need to be explored.

In this paper, the authors studied the different investment opportunities within the African stock exchange markets as well as their associated challenges. The authors have mainly focused on three countries stock exchanges, i.e. Nigeria Stock Exchange (NSE), Ghana Stock Exchange (GSE) and the Rwandan Stock Exchange (RSE). The Nigeria Stock Exchange evolved in 1977 from the Lagos Stock Exchange which was established in 1961 and had about 200 listed companies with market capitalization value of $80.8 billion in December 2013. The Ghana Stock Exchange was established in 1989 but started to trade in 1990 and had 36 listed companies, 3 government bonds and 1 corporate bond in 2015. The Rwandan Stock Exchange was established in 2011 and has currently market capitalization value of $4.03 billion, 2021.

The authors recommended to these 3 stock exchanges as well as other African countries to expand, develop and modernize their stock market, set a proper regulatory framework and include other African countries to form like a block of stock exchanges that could attract even more investors.

2.2.8. (Prakasam, 2014)**:**

It is believed that there is some type of correlation between the development of stock markets and the changes in economic activities. In this study, the authors analysed the direction of causality between stock market development and economic growth in India. The study period was from June 1991 to June 2013 and the authors have used cointegration and causality tests for analysis. They have also used econometric models like Autoregressive Distributed Lag Model to investigate the long run relationship between stock market variables and Indian economic growth and Vector Error Correction Model to check temporal causality between stock market development and economic growth in India.

CSIBER, Kolhapur

The study confirmed that there exists a long-run relationship between the stock market development indicators and economic growth in India. The authors observed that there is bidirectional causality between market capitalization and economic growth and unidirectional causality from turnover ratio to economic growth in the long run and the short run. From a broad view, the authors noted that both market capitalization and turnover ratio have a positive impact on economic growth in India.

2.2.9. (Chimpango, 2014)**:**

Many studies have mentioned that there could be a strong correlation between the level of capital markets development and the level a country's growth and development. In this study, the author wanted to explore various development theories that could be used to design and implement legal and institutional reforms for the promotion of capital markets development in developing countries in general and Southern African Development Community (SADC) region in particular.

The author has compared some stock exchanges of ten countries in the SADC region starting from the year they were founded, their stock exchange names, the number of their listed companies (in 2009) and their market capitalization values (in 2009). The author observed that most of these countries' capital markets were established at the command of the World Bank and the IMF as an additional element in the structural reform programmes, however there was still a lot of things to be done by those countries in order to achieve some level of their capital markets growth.

The author ended by suggesting that institutional structure play a huge role in capital market development and that they should be looked into, not only by the countries in SADC, but also by other developing countries as well.

2.2.10. (Rahimzadeh, 2012)**:**

In every country, banks and capital markets play a key role, when they exist and are well structured, in the country's development. In this paper, the author has studied the role and importance of stock market as well as the banking sector on production improvement. The data

used for the study was collected on Middle East and North Africa countries, specifically 11 countries, from the year 1990 to 2011.

The author used statistical tools to check whether the variables under study were stationary, then the co-integration method with Kao panel data co-integration test was used for further analysis. The variables under study were the level of production, the physical capital, the human capital, the stock market variable, the labor force, the banking sector variable and the level of technology. After the analysis, the author has observed that the banking sector has positive and considerable impact on countries' production.

2.2.11. (Barra, 2010)**:**

It is a relevant question to wonder whether capital markets have a significant impact on a country's economic growth. In this paper, the authors tried to give an answer to the question whether there exist a link between GDP Growth of a country and Equity Returns because in some fast growing markets, countries and investors have wondered if the increasing GDP was correlated to the higher market returns. The authors have used Supply-side models where GDP is assumed to change into corporate profit growth, aggregate earnings growth is expected to transform into Earnings per Share (EPS) growth and EPS growth is expected to translate into stock prices increases.

The authors have analysed first the correlation between GDP and aggregate corporate earnings, then checked if the aggregate corporate earnings growth changes into EPS growth, and lastly analysed whether EPS growth transforms into stock price increases with the help of the following equation $1 + r = (1 + g_{rEPS})(1 + g_{PE})$ where, r is the price return of the stock, g_{rEPS} is the growth rate in real earnings per share, and g_{PE} is the growth rate in the price-to-earnings ratio.

The authors have observed that in the long run the real earnings growth increased at a significantly slower pace in comparison to the long term GDP growth in many countries. They also observed that there are limitations on the assumed link between GDP and stock growth, and the investors' expectations of the future GDP growth based on today's valuations has an important impact on the development of the economy.

2.2.12. (Ziorklui, 2001)**:**

Capital markets are not a new concept in the world's evolution but it has been proved to be complex to develop in some countries comparing to others. In this study, the author tried to bring to light in discussion, the different constraints to capital market development in Ghana, which is a country situated in West Africa. The author also analysed how policy changes in that country could impact capital market development, growth, and poverty alleviation. Some of the challenges explored by the author were the underdevelopment of capital markets such as stocks/securities markets, and other financial institutions that intermediate the capital markets.

The author examined as well the challenges of regionalizing and globalizing capital markets and the relationship between market development and real sector growth in the economy of Ghana. The study analysis was based on both primary data, collected through field survey questionnaires and interviews, and secondary data. The field survey returns were collected in June/July 1998.

The scope of the secondary data on the stock exchange was from January 1990 to December 1998. The author has undertaken regression modelling and estimation to examine the link between various indices of capital market development and real sector growth. The regression model used was an adaptation of the work cited by Levine (1997) represented in the equation $GDPRG = f(C, K)$, where $GDPRG$ is real GDP growth rate, C is a vector of proxies representing capital markets for debt securities or credit and K is a vector of proxies for equity capital (stock) market development.

The author has found in the study that the financial sector reform has addressed some of the major constraints toward the development of the capital market in Ghana. The author also mentioned how the commitment of the government to a comprehensive structural and financial sector reform began to bear useful results and that the reconstructing of the banking sector and the liberalization of interest rates have strengthened the banking sector and the policy environment has been immensely improved. However, even if Ghana experienced some important successes in capital market development. Some major challenges remain such as fiscal deficits.

CSIBER, Kolhapur

2.3. Conclusion

In this chapter, the researcher has presented the reviews of twelve different literatures written by various authors from India as well as foreign authors. In these reviews, it can be observed how the concept of capital markets is a broad topic and has been discussed upon from numerous angles by different persons. Most of the authors studied the impact of capital markets indicators such as market capitalization, countries' exchange rates, and so on, in relation to other to GDP growth of the countries. The authors have used econometric models and statistical tools such as: Vector Error Correction Model (VECM), Granger causality test, cointegration test, Autoregressive Distributed Lag Model, regression model, etc., to study and analyse the relationship amongst their selected variables. There has been numerous debates around the fact that capital markets must be having a certain impact on a country's economic growth and development. In this study, the researcher will study three variables namely, market capitalization, exchange rate, and stocks traded value to understand their impact on the GDPs of India and South Africa.

Chapter-III
Theoretical Background

3.1. Introduction

3.1.1. Definition

According to the Oxford dictionary, *Capital Markets* can be defined as the part of a financial system that deals with raising capital through shares, bonds, and other long-term investments.

In *Capital Markets,* various financial instruments (cash, stocks, bonds, etc.) are raised and channelized from the capital suppliers to those in need of capital.

3.1.2. Types

There are two types of *Capital Markets*:

- Primary Market
- Secondary Market

In the Primary Market, the transactions are directly made between the company that raises the capital, by issuing financial instruments, and the investors who become shareholders of the company. The main objective of the Primary Market is the capital formation. A company can acquire funds from the primary market by using different methods such as: Public Issue (or Initial Public Offering) where the company issues shares to the public for the first time, Private Placement where it offers the shares to a few selected investors like mutual funds, banks, etc., and Right Issue (or Rights Offer) where some listed companies raise capital by offering shares to existing shareholders.

In the Secondary Market, all the securities previously issued by companies are directly traded between investors and sellers. These transactions are made through different stock exchanges or Over-the-Counter market (also known as the Off-exchange trading) where trading of securities takes place between buyers and sellers who openly announce the prices at which they wish to sell or buy the respective securities.

3.1.3. Functions

Some of the main functions of *Capital Markets* are:

- Savings Mobilization between savers and entrepreneurial borrowers.
- Formation of Capital to increase the stock of real capital by creating capital goods like factories, machinery, equipment, etc., which are used to produce other goods.
- Rapid Economic Growth due to increased productivity reached with the help of technologically advanced capital goods.
- Benefits to Investors who are offered a different range of instruments like bonds, mutual funds, equities, etc., and can therefore diversify and channelize their savings into the most profitable avenues.
- Variety of Services such as underwriting consultancy, credit rating, export finance, etc. which are benefited by investors.
- Continuous Availability of Funds for long term investments through organized stock exchanges which makes *Capital Markets* a liquid market.

3.2. Evolution of Capital Markets

3.2.1. History of Capital Markets

The first example of a financial market were banks and lenders in early 14th century Europe. These markets operated before the idea of stock, the partial ownership of a company obtained by buying shares. For early banks and moneylenders, the financial markets were all **debt-based**. They would give loans to governments and individuals, then they would buy, sell, and trade the repayment of the loan.

Indian Capital Market history

The history of the Capital Market in India dates back to the 18th century when East India Company securities were traded in the country. Until the end of the 19th century, securities trading was unorganized and the main trading centers were Bombay (now Mumbai) and Calcutta (now Kolkata). Of the two, Bombay was the chief trading center wherein bank shares were the major trading stock During the American Civil War (1860-61). Bombay was an important source of supply for cotton. Hence, trading activities flourished during the period, resulting in a boom in share prices. This boom, the first in the history of the Indian capital

market lasted for a half a decade. The bubble burst on July 1, 1865 when there was tremendous slump in share prices.

The capital market was not well organized and developed during the British rule because the British government was not interested in the economic growth of the country. As a result many foreign companies depended on the London capital market for funds rather than in the Indian capital market.

In the post-independence period also, the size the capital market remained small. During the first and second five year plans, the government's emphasis was on the development of the agricultural sector and public sector undertakings. The public sector undertakings were healthier than the private undertakings in terms of paid up capital but shares were not listed on the stock exchanges. Moreover, the Controller of Capital Issues (CI) closely supervised and controlled the timing, composition, interest rates pricing allotment and floatation consist of new issues. These strict regulations de-motivated many companies from going public for almost four and a half decades.

Bombay Stock Exchange (BSE) was the first ever stock exchange in Asia established in 1875 and the first in the country to be granted permanent recognition under the Securities Contract Regulation Act, 1956. The National Stock Exchange (NSE) was incorporated in 1992. It was recognised as a stock exchange by SEBI in April 1993 and commenced operations in 1994 with the launch of the wholesale debt market, followed shortly after by the launch of the cash market segment.

South African Capital Market history

The JSE was formed in 1887 during the first South African gold rush. Following the first legislation covering financial markets in 1947, the JSE joined the World Federation of Exchanges in 1963 and upgraded to an electronic trading system in the early 1990s. The bourse demutualised and listed on its own exchange in 2005.

In 1993, the JSE became a founder member of the African Stock Exchanges Association (ASEA). In 1997, the Electronic clearing and settlement concept, Shares Transactions Totally Electronic (**Strate**) was introduced.

Regulation of Capital Markets

Even after more than several centuries from the emergence of capital markets, there was a severe case of lack of investor protection on the market. In the modern era, investors buy, sell, and trade financial assets with a sense of security. If a corporation deceives its investors, there is an avenue through which to seek recompense.

3.2.2. Concept of Capital Markets

What are Capital Markets?

The Capital Markets are a source of financing for companies around the world. The most famous of the capital markets are the *stock market* and *bond* market.

How Capital Markets Work?

Companies utilize Capital Markets to raise *money* for projects by issuing *stock* IPOs, *bonds* and short-term money market securities. Individual investors wish to earn interest or dividends on their *savings* can meet companies looking to raise *funds* by issuing securities.
To understand how a corporate bond moves through capital markets, suppose XYZ Co. needs to raise $10000. XYZ Co. offers a 10-year *bond* on the bond market with a par value of $10000. The bond is purchased by someone wishing to earn interest on the $10000 that they have available. XYZ Co. receives the $10000 in cash and the investor receives a bond and the promise of *repayment plus interest*. Should the bondholder later decide that they no longer want the bond, they can sell it to another investor in the marketplace. With *stocks*, let us suppose the XYZ Co. decided to raise *more funds* by issuing ten new shares of stock for $1000 per share. XYZ Co. offers these shares in the market and someone purchases all ten for $10000 total. This time, the investor obtains stock certificates giving him partial ownership of the company. XYZ Co. gets the $10000 in funds they wanted to raise. As in the above example, should this investor wish to no longer hold these stocks, they can sell them to another investor in the stock market for the current market price. Should the company have extra cash, it could buy the stock back as well.

Why Capital Markets Matter?

Capital markets serve two purposes. Firstly, they bring together investors holding capital and companies seeking capital through equity and debt instruments. Secondly, and almost more importantly, they provide a secondary market where holders of these securities can exchange them with one another at market prices. Without the liquidity created by a secondary market, investors would be less inclined to purchase equity and debt instruments for fear of being unable to unload them in the future.

3.3. India vs. South Africa: economic and capital markets status

3.3.1. Capital Markets status

India -

In India, the capital market is a market for securities, where companies and governments can raise long term funds. It is a market designed for the selling and buying of stocks and bonds. Stocks and bonds are the two major ways to generate capital and long term funds. Thus, the bond markets and stock markets are considered as capital markets. The Indian securities market consists of primary (new securities) market and secondary (stock) market in both equity and debt. The primary market provides channel for sale of new securities while the secondary market deals in trading of previously issued securities. The Indian Equity Market is mainly consisted by two major stock exchanges: National Stock Exchange of India (NSE) and The Bombay Stock Exchange (BSE). The benchmark indices of the two exchanges, Nifty of NSE and Sensex of BSE, are closely monitored by the investors. The capital market provides the support to the system of capitalism of the country. The Securities and Exchange Board of India (SEBI), along with the Reserve Bank of India are the two regulatory authority for Indian securities market, to protect investors and improve the microstructure of capital markets in India. With the increased application of information technology, the trading platforms of stock exchanges are accessible from anywhere in the country through their trading terminals. India has a fair share of the world economy and hence the capital markets or the share markets of India form a considerable portion of the world economy. The capital market is vital to the financial system.

South Africa -

Overall, African equity capital market (ECM) activity in 2020 was the lowest it has been in the last decade, recording a significant decline in both volume and value. The drop in equity markets was largely driven by the impact of the repercussions of the COVID-19 pandemic as well as global and economic uncertainty. Moderate recovery in African markets was noted in the second half of the year with most deals occurring in the last quarter. The slowdown effect of the pandemic was also evident in the volumes and values of non-local corporate, sovereign and supranational debt raised during the year. The Johannesburg Stock Exchange (JSE) is the only licenced exchange for the listing of equity (and debt) securities in South Africa. It has two boards for listing equity securities: the Main Board and the Alternative Exchange (AltX) for small and medium-sized companies. The JSE Limited (JSE), as the only licenced exchange in South Africa, is licenced and regulated under the Financial Markets Act 2012. The Financial Services Board oversees and supervises the JSE in its performance of its regulatory duties.

In general, a company seeking a primary listing on the JSE Limited (JSE) must:

- Meet certain requirements relating to minimum size, minimum percentage of shares in public hands and trading records and accounts.
- Comply with the Listings Requirements (these differ based on whether the company seeks a listing on the Main Board or the Alternative Exchange (AltX)).
- Pay the required listing fee.

In addition to the conditions applicable to listing on the Main Board, a company seeking a listing on the AltX must:
- Appoint a designated adviser.
- Have completed the AltX Directors Induction Programme or must make arrangements to the satisfaction of the JSE to complete it.
- Appoint an executive financial director and the audit committee of the company must be satisfied (and submit written confirmation to the JSE to this effect) that the financial director has the appropriate expertise and experience to fulfil his role
- Present a comprehensive business plan to the AltX Advisory Committee. The JSE considers whether or not to grant a listing following written confirmation from the AltX Advisory Committee as to the eligibility of the company.

3.3.2. Indian vs. South African economic welfare

Definitions

Economic growth can be defined as an increase in the total amount of goods and services produced per head of the population of a specific country over a year. It can be measured in terms of Gross Domestic Product (GDP).

Economic welfare can be broadly defined as the level of prosperity and standard of living of either an individual or a group of persons.

It is common to use Gross Domestic Product (GDP) as a measure of the standard of living or economic welfare of a nation. Economists traditionally use the GDP to measure the progress of the economy of countries. If the GDP is rising, it usually means that the country's economy is in good shape. On the other hand, if it is falling, it could mean that the country's economy might be in trouble.

GDP can be defined as the total monetary value of all final goods and services that have been exchanges within a country over a certain period of time. GDP can be calculated with the help of the following formula:

GDP = private consumption + gross investment + government investment + government spending + (exports – imports)

However, when comparing the GDP of different nations, we have to do the following steps to avoid issues that could rise. Firstly, the GDP values of the two countries should be converted into a common currency. Secondly, countries have different numbers of population, so while trying to compare standards of living across two countries, the researcher needs to divide their respective GDP by their respective population to find their GDP per capita in order to get a more accurate comparison of the economic welfare of the two nations.
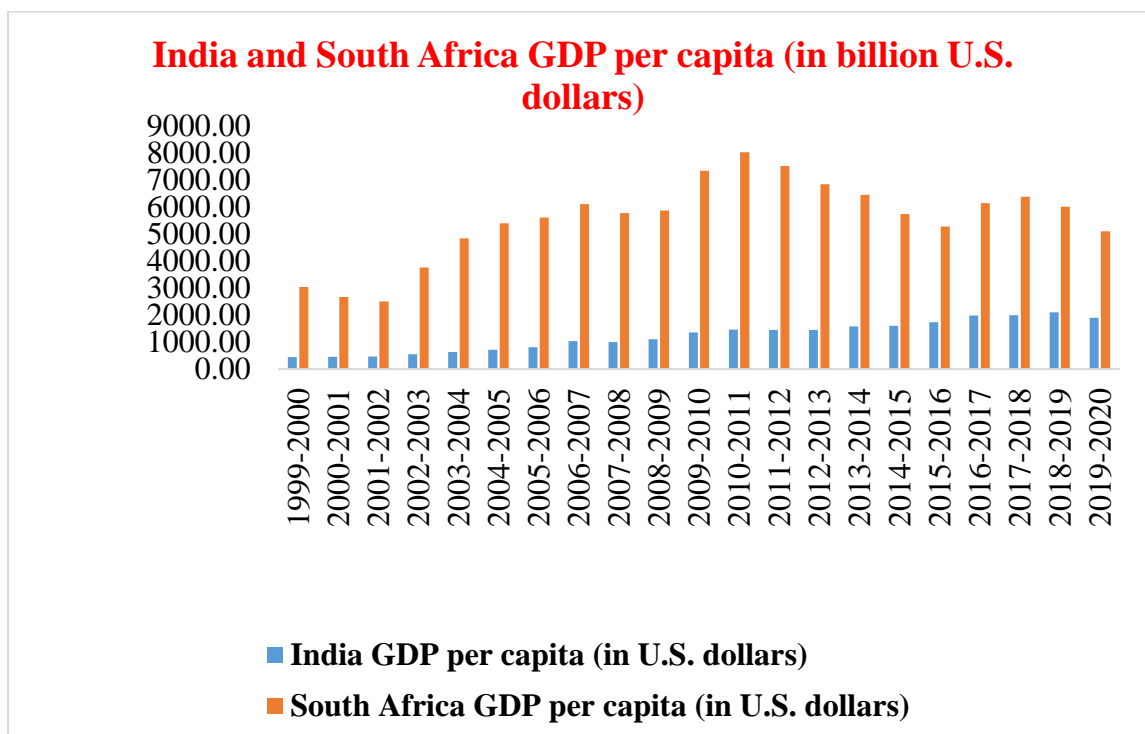
The researcher has collected two decades GDP data of both India and South Africa and below if the graph which represents the comparison of the two nations based on their respective GDP trends over the years.

India and South Africa GDP (in billion U.S. dollars)

Data source: http://www.data.worldbank.org/
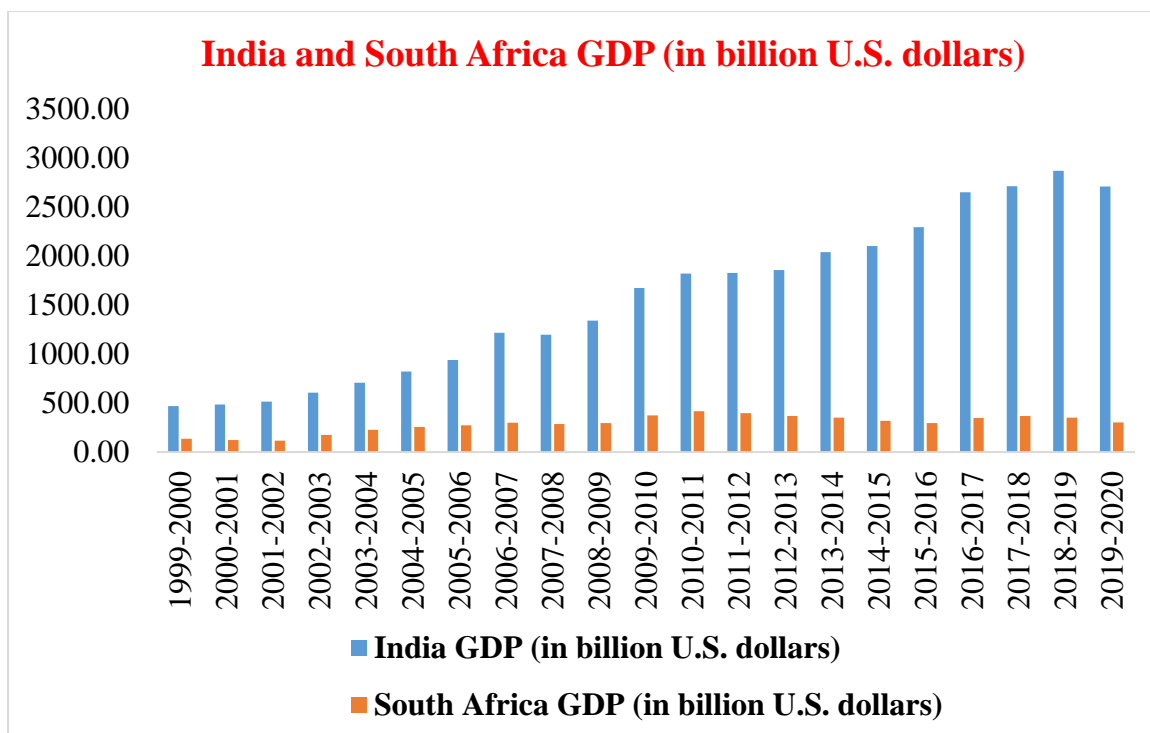
Graph Source: Excel 2013

The researcher has also collected two decades GDP per capita data of both countries and below if the graph that was generated.

India and South Africa GDP per capita (in billion U.S. dollars)

Data source: http://www.data.worldbank.org/

CSIBER, Kolhapur

Graph Source: Excel 2013

Interpretation

Based on the above graphs' representations, the researcher has noticed that Indian GDP average is 5 times greater than the South African GDP over the past two decades. However, after considering the population of both countries and plotting the respective GDP per capita of the two nations, the researcher has found that the South African GDP per capita average is 5 times greater than the Indian GDP per capita over the past two decades. With the above findings, it can be said that based on the GDP per capita of the two countries, the standard of living or economic welfare of South Africa is on an average 5 times greater than the standard of living or economic welfare of India. However, further analysis need to be done by the researcher to determine the relationships between the GDPs, the Capital Markets and the economic growths of the two nations.

3.4. Analysis tools

In this study, the researcher used time series data from 2000 to 2020. The variables to be analysed are: Gross Domestic Product, Market Capitalization, Stocks Traded Value, and Exchange rate. The standard equation based on these variables is expressed as follows:

$$GDP = f(MCAP, STVL, EXCHR) \tag{1}$$

Where,

GDP = Gross Domestic Product (factor of economic growth),

MCAP = Market Capitalization,

STVL = Stocks Traded Value, and

EXCHR = Exchange Rate.

A detailed form of equation (1) will be as follows:

$$GDP_t = \beta_0 + \beta_1 MCAP_t + \beta_2 STVL_t + \beta_3 EXCHR_t + \mu_t \tag{2}$$

In the above equation, β_0 represents the intercept or constant of the relationship in the model where β_1, β_2 and β_3 are coefficients of each of the independent variables and μ is the stochastic or error term.

The linear representation of the equation (2) expressed as logarithms will be as follows:

$$Log(GDP_t) = \beta_0 + \beta_1 Log(MCAP_t) + \beta_2 Log(STVL_t) + \beta_3 Log(EXCHR_t) + \mu_t \quad (3)$$

The researcher will use different econometric tests and models to study the above listed variables.

3.4.1. Unit root test

A unit root (also known as a unit root process or a difference stationary process) is a stochastic trend in a time series. A unit root test checks whether a time series has a unit root which is one cause of the time series to be non-stationary. It is the null hypothesis which is generally assumed to have a unit root and the alternative hypothesis is considered to be stationary.

As a convention, before an econometric model can be selected, there has to be a test to check whether the data series is non-stationary. Then the order of integration will be determined. In general, the data series is said to be stationary only if it meets the following conditions: the mean and the variance are constant over time.

There are various tests that can be used to test the presence of a unit root and some of them are:

- The Dickey-Fuller test which was the first statistical test developed to test the null hypothesis, whether there is a presence of a unit root in the given time series, and that the data is thus non-stationary. Some extended versions of the test were developed to assist in more complex models and data and these include the Augmented Dickey-Fuller test (ADF) which uses autoregressive of any order p and supports modelling of time trends, the Phillips-Perron test (PP) which adds robustness to unspecified autocorrelation and heteroscedasticity, and the ADF-GLS test which locally de-trend data to deal with constant and linear trends.
- The KPSS test which is also used to test the presence of a unit root. On the contrary of the Dickey-Fuller tests, the null hypothesis assumes stationary around a mean or a linear trend, while the alternative hypothesis has a presence of a unit root.

3.4.2. Johansen co-integration test

Co-integration is a significant tool for analysing the long-run relationships in time series. Co-integration happens when two or more non-stationary time series have a long-run equilibrium at a certain point, change in a way that their linear combination results in a stationary timer series, and share an underlying common stochastic trend. It is vital that one checks that all series in the data sets contain the same order of integration I (1) before starting to do the co-integration test. The co-integration test checks the validity of a co-integrating relationship with the help of a Maximum Likelihood Estimates (MLE) approach.

3.4.3. Vector Error Correction Model

Co-integration also presumes that time series will be connecting through an Error Correction Model (ECM) which gives a better perspective of the long-run dynamics. The error correction model helps in reaching the long-run equilibrium relationships of variables, introduces a short-run dynamic adjustment mechanism that shows how variables adjust when they not in equilibrium, and utilises adjustment coefficients to measure the forces that push the relationship in the direction of the long-run equilibrium. The Vector Error Correction Model (VECM) is the multivariate extension of the ECM.

3.5. Conclusion

In this study, the methodology used by the researcher is to study the selected variables namely, Gross Domestic Product, Market Capitalization, Stocks Traded Value, and Exchange rate, using econometric tests such as unit root, co-integration, and causality tests, and econometrics models like Vector Autoregressive (VAR) model, Error Correction Model (ECM), and Vector Error Correction Model (VECM) to assess the long-run dynamics among the variables under study.

Chapter-IV

Data Analysis and Interpretation

4.1. Introduction

In this section, the study focuses on the analysis of data and their interpretations. A test of unit root is conducted with the help of the ADF unit root test. To check for the causality, the Engle Granger will be employed and the VECM test follows shortly after that. The following steps have been taken for the data analysis.

4.2. Data Analysis

In this process, the researcher aims to clean, transform and model the data to discover helpful information. The purpose is to extract practical information from the data and provide the findings and suggestions based upon the analysis.

4.2.1. Importing and plotting the data

The study period of the data collected is for the years from 2000 to 2020. To do the analysis, the researcher has used the R software, and the first step is to import the data with the help of the following R codes.

The time series data to be analysed shows the values of 4 different variables for each of the 2 countries under study, namely India and South Africa. Each row represents the number of years under study, i.e. from 2000 to 2020 while each column represents the variables under study of the 2 countries. The total number of observations is 21. For assigning the time series to this data, the researcher has used the following R code.

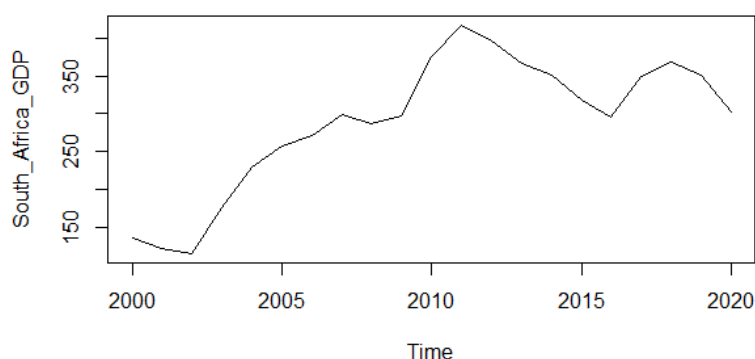**1) Output of time series plot of India GDP in billion U.S. dollars**

Data source: http://www.data.worldbank.org/
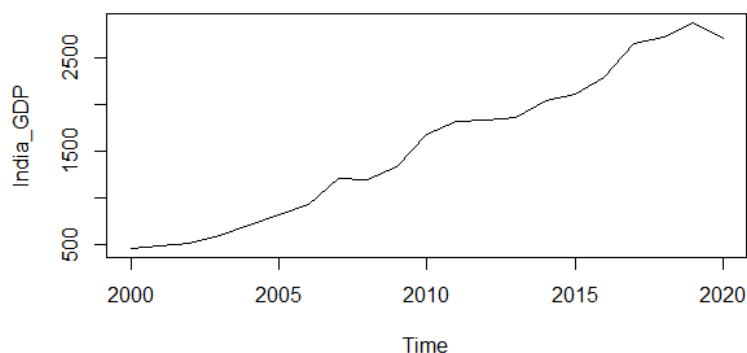
Graph source: R software – R-4.1.0

Interpretation

The graph above shows that there is a deterministic trend. This is because there is a positive increase in the trend. The X-axis shows the number of years while the Y-axis indicates the values of GDP in India over the years. During the study period, the researcher has observed that, there is a consistent trend in the performance of GDP of India. GDP represents the health of an economy and this shows that India has a positive economic growth except in the years of 2008 and 2020 where it has slightly decreased in comparison to the previous years.

**2) Output of time series plot of South Africa GDP in billion U.S. dollars**

Data source: http://www.data.worldbank.org/

Graph source: R software – R-4.1.0

CSIBER, Kolhapur

Interpretation

The graph above appears to have a random walk with a drift. The X-axis shows the number of years while the Y-axis indicates the values of GDP in South Africa over the years. During the study period, the researcher has observed that, there is a no consistent trend in the performance of GDP of South Africa. GDP represents the health of an economy and this shows that South Africa has an unstable economic growth where a decrease can be observed in the years 2002, 2008, 2012-2016 and 2019-2020.

3) Output of time series plot of India Exchange Rate (USD into INR)
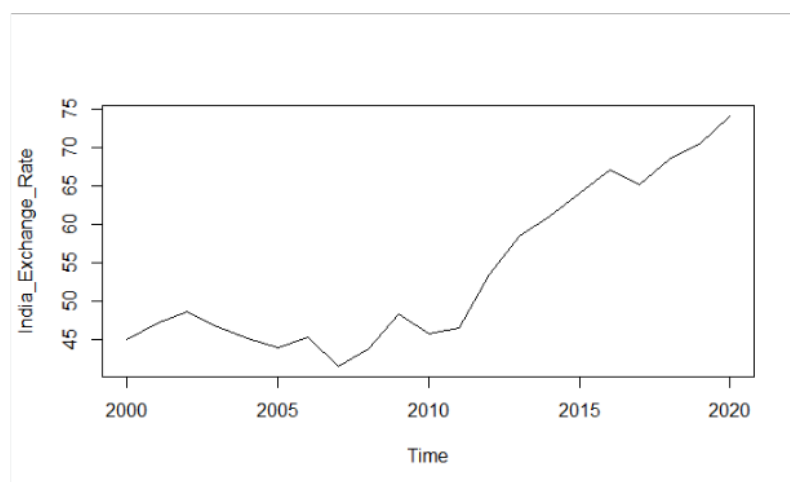
Data source: https://www.ofx.com/

Graph source: R software – R-4.1.0

Interpretation

The graph above appears to have a deterministic trend. The X-axis shows the number of years while the Y-axis indicates the values of Exchange rates of U.S. dollars (USD) into Indian Rupees (INR) over the years. During the study period, the researcher has observed that, there is a trend in the performance of Exchange Rate of India. At first, the time series has continuously decreased till the year 2007 and started to increase continuously till the year 2016 after which a small decrease occurred again but shortly increased again from the year 2018 onwards.

4) Output of time series plot of South Africa Exchange Rate (USD into ZAR)
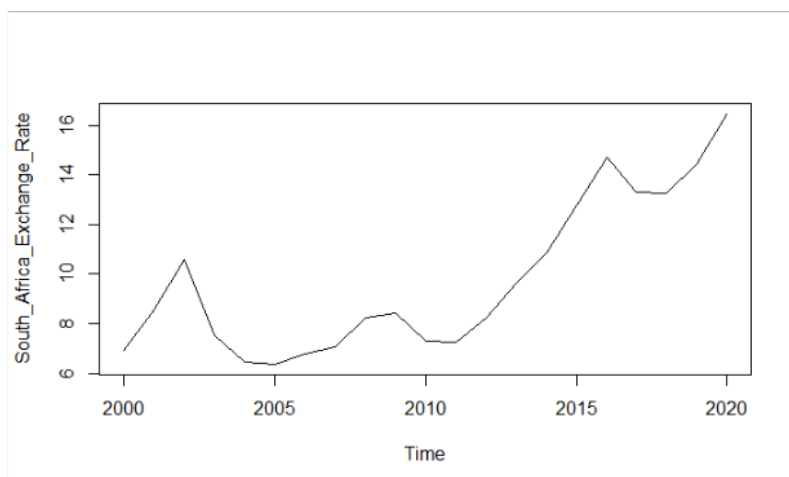

Data source: https://www.ofx.com/

Graph source: R software – R-4.1.0

Interpretation

The graph above appears to have a deterministic trend. The X-axis shows the number of years while the Y-axis indicates the values of Exchange rates of U.S. dollars (USD) into South Africa Rand (ZAR) over the years. During the study period, the researcher has observed that, there is a trend in the performance of Exchange Rate of South Africa. The time series has continuously increased and decreased over the years, it has peaked in the years 2002, then 2009, 2016 and 2020. From the year 2000 to 2011 the time series increased at a slow pace and from 2012 to 2020, it increased at a much faster pace.

5) Output of time series plot of India Market Capitalization in billion U.S. dollars
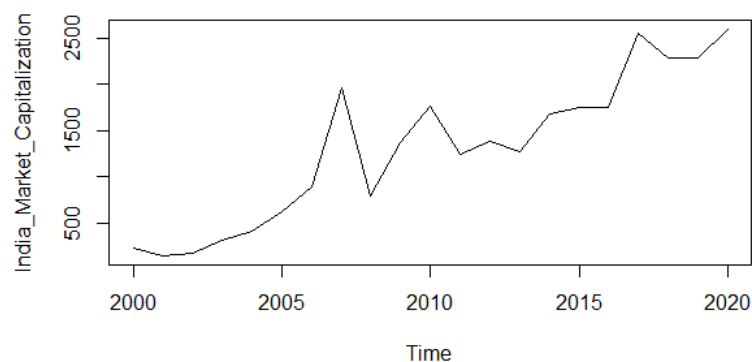
Data source: https://ycharts.com/indicators/india_market_capitalization_of_listed_companies_usd

CSIBER, Kolhapur

Source: R software – R-4.1.0

Interpretation

The graph above shows that the time series appears to have a random walk with drift and deterministic trend. The X-axis shows the number of years while the Y-axis indicates the values of Market Capitalization in India over the years. During the study period, the researcher has observed that, there is a trend and unstable growth in the performance of Market Capitalization of India. The time series shows a trough in the years 2001, 2008, 2011, 2013 and 2018.

6) Output of time series plot of South Africa Market Capitalization in billion U.S. dollars

Data source:

https://ycharts.com/indicators/south_africa_market_capitalization_of_listed_companies_usd
Graph source: R software – R-4.1.0

Interpretation

The graph above shows that the time series appears to have a random walk with drift and deterministic trend. The X-axis shows the number of years while the Y-axis indicates the values of Market Capitalization in South Africa over the years. During the study period, the researcher has observed that, there is a trend and unstable growth in the performance of Market Capitalization of South Africa. The time series shows a trough in the years 2001, 2008, 2011, 2015 and 2018.

7) Output of time series plot of India Stocks Traded Value in billion U.S. dollars
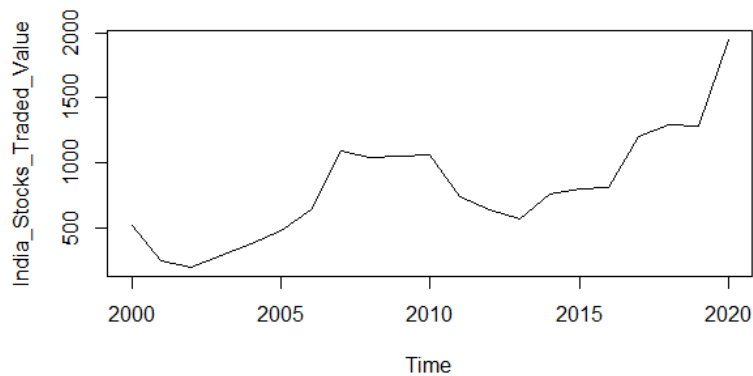
Data source: https://knoema.com/atlas/India/topics/Economy/Financial-Sector-Capital-markets/Stocks-traded
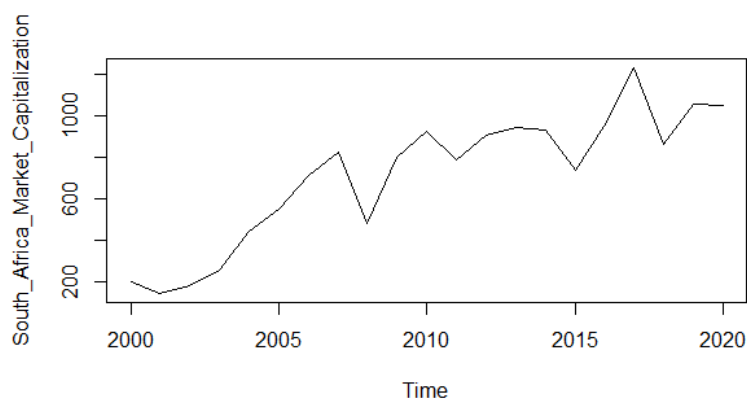
Graph source: R software – R-4.1.0

Interpretation

The graph above shows that the time series appears to have a deterministic trend. The X-axis shows the number of years while the Y-axis indicates the stocks traded values in India over the years. During the study period, the researcher has observed that, there is a trend in the performance of Stocks Traded Value of India. The time series has continuously increased over the years but also shows troughs in the years 2002 and 2013. From the year 2000 to 2010 the time series increased at a slow pace and from 2013 to 2020, it increased at a much faster pace.

8) Output of time series plot of South Africa Stocks Traded Value in billion U.S. dollars
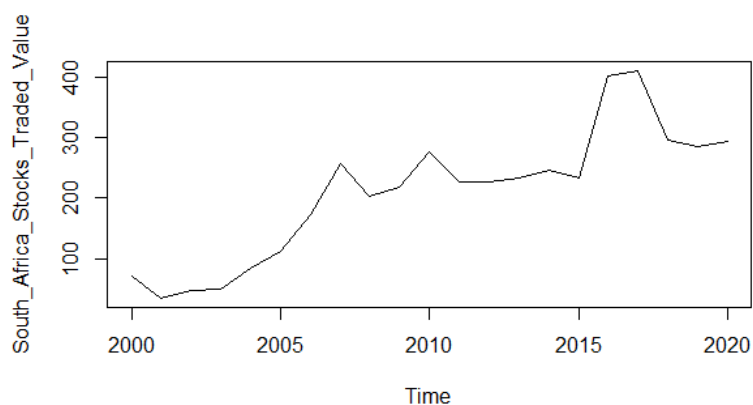
CSIBER, Kolhapur

Graph source: R software – R-4.1.0

Interpretation

The graph above shows that the time series appears to be a random walk with drift and deterministic trend. The X-axis shows the number of years while the Y-axis indicates the stocks traded values in South Africa over the years. During the study period, the researcher has observed that, there is a trend and unstable growth in the performance of Stocks Traded Value of South Africa. The time series shows a decrease in the years 2001, 2008, 2011, 2015 and 2018-2019.

4.2.2. Augmented Dickey-Fuller tests

Non-stationary processes:

- **Simple Random Walk**

A simple random walk is a stochastic non-stationary time series which has a random trend that varies over time. The model of a simple random walk has no intercept and is represented by the following equation:

$Y_t = \varphi Y_{t-1} + u_t$

Where,

Y_{t-1} is the lag value, φ is the coefficient of the lag value and u_t is the error term.

- **Random Walk with drift**

A random walk with drift is a model process which predicts that the value at time "t" will equal the last period's value plus a constant also called a drift (α), and a white noise term (u_t). The model is represented by the following equation:

$Y_t = \alpha + \tau Y_{t-1} + u_t$

Where,

Y_{t-1} is the lag value, α is the drift parameter, τ is the coefficient of the lag values and u_t is the white noise term.

- **Deterministic trend**

A non-stationary process with a deterministic trend is regressed in a time trend (β_t). It has a mean that grows around a fixed trend, which is constant and independent of time. The model is represented by the equation below:

$Y_t = \alpha + \beta t + u_t$
Where,

βt is a linear trend parameter (β is time dependent), α is a constant and u_t is the error term.

- **Random Walk with drift and deterministic trend**

It is a non-stationary process that combines a random walk with a drift component (α) and a deterministic trend (βt). The model is represented by the equation below:

$Y_t = \alpha + \tau Y_{t-1} + \beta t + u_t$
Where,

βt is a linear trend parameter (β is time dependent), α is a constant, τ is the coefficient of the lag values and u_t is the error term.

ADF test of the variables under study:

H0: The time series is non-stationary

H1: The time series is stationary

<div align="center">

Case 1: India

</div>

Table 1. ADF unit root test for variables at levels and 1st difference (**India**)

Variables	ADF test statistics at levels	Remarks	ADF test statistics at 1st difference	Remarks
LGDP	-3.387(**-3.60**)	Non-Stationary	-4.030(**-3.00**)	Stationary
LEXCHR	-1.648(**-3.60**)	Non-Stationary	-2.362(**-1.95**)	Stationary
LMCAP	-2.904(**-3.60**)	Non-Stationary	-4.042(**-1.95**)	Stationary
LSTVL	-1.129(**-3.60**)	Non-Stationary	-2.429(**-1.95**)	Stationary

Interpretation

All the variables are non-stationary at levels as their test statistic values are all greater than the values at 5% significance level. However, all variables become stationary at their first differences as their test statistic values are all less than the values at 5% significance level. The results furthermore suggest that the variables are co-integrated in the order one (1). Therefore, the null hypothesis of non-stationary is rejected.

Case 2: South Africa

Table 2. ADF unit root test for variables at levels and 1st difference (**South Africa**)

Variables	ADF test statistics at levels	Remarks	ADF test statistics at 1st difference	Remarks
LGDP	-2.577(**-3.00**)	Non-Stationary	-3.077(**-1.95**)	Stationary
LEXCHR	-1.983(**-3.60**)	Non-Stationary	-3.639(**-1.95**)	Stationary
LMCAP	-2.533(**-3.60**)	Non-Stationary	-4.364(**-1.95**)	Stationary
LSTVL	-2.804(**-3.60**)	Non-Stationary	-3.706(**-1.95**)	Stationary

Interpretation

Like for the case of the variables of India, all the variables are non-stationary at levels as their test statistic values are all greater than the values at 5% significance level. However, all variables become stationary at their first differences as their test statistic values are all less than the values at 5% significance level. The results furthermore suggest that the variables are co-integrated in the order one (1). Therefore, the null hypothesis of non-stationary is rejected.

4.2.3. Co-integration tests

Before getting into a formal module on the Vector Error Correction Model, it is important to understand where co-integration is coming from. And to do that, the researcher has checked whether co-integration exists in the study, i.e. a linear combination of the non-stationary variables could potentially be stationary. Thus the researcher has used the Johansen test to check co-integration between the variables.

H0: There is at least one co-integrating relationship

H1: There is no co-integrating relationships

CSIBER, Kolhapur

Since a model needs to be built, the researcher has bound the first difference values into a system by creating an object into which the variables are put together, then has proceeded to the lag selection criteria by creating a lag object. Assuming that there is a co-integrating relationship, we have to subtract one lag from the lag order determined.

Case 1: India

9) Output of Lag selection criteria

AIC(n)	HQ(n)	SC(n)	FPE(n)
3	3	3	3

Source: R software – R-4.1.0

Case 2: South Africa

10) Output of Lag selection criteria

AIC(n)	HQ(n)	SC(n)	FPE(n)
3	3	3	2

Source: R software – R-4.1.0

Interpretation

From the above output, the final prediction errors suggests that 3 is the optimal lag for both India and South Africa time series under study. By convention, the researcher will use 3 – 1 = **2** lags for further analysis. After completing with the lag selection, the next step is to specify the Johansen tests. There are two variants of the Johansen test: *the Trace statistic approach* and *the Maximum Eigen value approach*. The command in R of the Johansen test supports both these approaches.

Johansen testing: Trace statistic approach

Case 1: India

11) Output of Johansen testing: Trace statistic approach

Values of test statistic and critical values of test:				
	test	10pct	5pct	1pct
r <= 3 |	**3.67**	7.52	**9.24**	12.97
r <= 2 |	**14.93**	17.85	**19.96**	24.60
r <= 1 |	**31.10**	32.00	**34.91**	41.07
r = 0 |	**64.25**	49.65	**53.12**	60.16

Source: R software – R-4.1.0

Interpretation

In the above output of the co-integration test (Trace test), there is a test column and three other columns which pertain to critical values at different percent significance levels. In social sciences, we will use the 5%. There is also a column with "r" values, where "r" represents the route of the error correction terms matrix. The values of "r" indicate potentially how many co-integrating relationships there are in the system.

When r = 0, the test statistic is equal to **64.25**, which is greater than **53.12** at 5% significance level, and means that we cannot reject the null hypothesis. That means that there should be at least one co-integrating relationship. When r <= 1, the test statistic is equal to **31.10**, which is less than **34.91** at 5% significance level, then we fail to reject the null hypothesis that r is less than or equal to 1. The conclusion of the Trace statistic approach is that there is at most **one co-integrating relationship** in the time series under study for the country India.

Case 2: South Africa

12) Output of Johansen testing: Trace statistic approach

Values of test statistic and critical values of test:				
	test	10pct	5pct	1pct
r <= 3 |	**7.99**	7.52	**9.24**	12.97
r <= 2 |	**20.27**	17.85	**19.96**	24.60
r <= 1 |	**39.40**	32.00	**34.91**	41.07
r = 0 |	**67.57**	49.65	**53.12**	60.16

Source: R software – R-4.1.0

Interpretation

Similarly like for the case of India, the researcher has used the "r" values to indicate potentially how many co-integrating relationships there are in the system.

When r = 0, the test statistic is equal to **67.57**, which is greater than **53.12** at 5% significance level, and means that we cannot reject the null hypothesis. That means that there should be at least one co-integrating relationship. When r <= 1, the test statistic is equal to **39.40**, which is greater than **34.91** at 5% significance level, then we also cannot reject the hypothesis that r is less than or equal to 1. That means that there are at least two co-integrating relationships. When r <= 2, the test statistic is equal to **20.27**, which is greater than **19.96** at 5% significance level, then we also cannot reject the hypothesis that r is less than or equal to 2. That means that there are at least three co-integrating relationships. When r <= 3, the test statistic is equal to **7.99**, which is less than **9.24** at 5% significance level, then we fail to reject the null hypothesis that r is less than or equal to 3.The conclusion of the Trace statistic approach is that there are at most **three co-integrating relationships** in the time series under study for the country South Africa.

Johansen testing: Maximum Eigen value approach

Case 1: India

13) Output of Johansen testing: Maximum Eigen value approach

Values of test statistic and critical values of test:			
test	10pct	5pct	1pct
r <= 3 | **3.67**	7.52	**9.24**	12.97
r <= 2 | **11.25**	13.75	**15.67**	20.20
r <= 1 | **16.18**	19.77	**22.00**	26.81
r = 0 | **33.15**	25.56	**28.14**	33.24

Source: R software – R-4.1.0

Interpretation

When r = 0, the test statistic is equal to **33.15**, which is greater than **28.14** at 5% significance level, and means that we cannot reject the null hypothesis. That means that there should be at least one co-integrating relationship. When r <= 1, the test statistic is equal to **16.18**, which is

less than **22.00** at 5% significance level, then we fail to reject the null hypothesis that r is less than or equal to 1. The conclusion of the Maximum Eigen value approach is that there is at most **one co-integrating relationship** in the time series under study for the country India.

Case 2: South Africa

14) Output of Johansen testing: Maximum Eigen value approach

Values of test statistic and critical values of test:			
	test	10pct	5pct	1pct
r <= 3 |	**7.99**	7.52	**9.24**	12.97
r <= 2 |	**12.28**	13.75	**15.67**	20.20
r <= 1 |	**19.13**	19.77	**22.00**	26.81
r = 0 |	**28.17**	25.56	**28.14**	33.24

Source: R software – R-4.1.0

Interpretation

When r = 0, the test statistic is equal to **28.17**, which is greater than **28.14** at 5% significance level, and means that we cannot reject the null hypothesis. That means that there should be at least one co-integrating relationship. When r <= 1, the test statistic is equal to **19.13**, which is less than **22.00** at 5% significance level, then we fail to reject the null hypothesis that r is less than or equal to 1. The conclusion of the Maximum Eigen value approach is that there is at most **one co-integrating relationship** in the time series under study for the country South Africa.

4.2.4. Vector Error Correction Model

The VECM will be used to determine whether there are some form of long-run relationships between the variables under study, and if there are, how many there are.

Case 1: India

In the Johansen testing, the researcher found that there is at most **one co-integrating relationship** with both the Trace statistic approach and the Maximum Eigen value approach in the time series under study for the country India. The researcher has built the VECM model with considering 2 lags and one co-integrating relationship. There are two methods that can be used to estimate the VECM model, i.e. the OLS variation and the ML variation. The following output was generated.

15) Output of Building VECM model

Co-integrating vector (estimated by 2OLS):			
D1GDP_In	D1EXCHR_In	D1MCAP_In	D1STVL_In
r1 1	-9.688828	-0.1465178	-0.259664

Source: R software – R-4.1.0

Interpretation

The output above displays the co-integrating equation of India time series under study. Since GDP was ordered first, it will be equal to one. It can be seen that there is a huge **negative** relationship between Exchange Rate and GDP, a small but **negative** relationship between Market Capitalization and GDP, and a small **negative** relationship between Stocks Traded Value and GDP. Since there is one co-integrated equation, it indicates that there is a long run relation between the variables, meaning that they all move together.

Case 2: South Africa

In the Johansen testing, the researcher found that there are at most **three co-integrating relationships** with the Trace statistic approach and **one co-integrating relationship** with the Maximum Eigen value approach in the time series under study for the country South Africa. The researcher has built the VECM model with considering 2 lags and three co-integrating relationships. The following output was generated.

16) Output of Building VECM model

Co-integrating vector (estimated by ML):			
D1GDP_SA	D1EXCHR_SA	D1MCAP_SA	D1STVL_SA
r1 1.000000e+00	-3.552714e-15	-5.551115e-17	-2.17220317
r2 -1.084202e-18	1.000000e+00	-3.469447e-18	0.05048853
r3 -1.665335e-16	-7.105427e-15	1.000000e+00	-2.65434489

Source: R software – R-4.1.0

Interpretation

The output above displays the co-integrating equations of South Africa time series under study. For r1, it can be seen that there is a **negative** relationship between Exchange Rate and GDP, a **negative** relationship between Market Capitalization and GDP, and a **negative** relationship between Stocks Traded Value and GDP. Since there is one co-integrated equation, it indicates that there is a long run relation between the variables, meaning that they all move together.

For r2, it can be seen that there is a **negative** relationship between Exchange Rate and GDP, a **positive** relationship between Market Capitalization and GDP, and a **negative** relationship between Stocks Traded Value and GDP.

For r3, it can be seen that there is a **positive** relationship between Exchange Rate and GDP, a **negative** relationship between Market Capitalization and GDP, and a **positive** relationship between Stocks Traded Value and GDP.

4.3.   Conclusion

Over the years of the study period from 2000 to 2020, can be noticed a continuous increasing trend in the economic growth performance of both India and South Africa. Based on the variables under study, it is observed that South Africa in increasing at a faster pace in comparison to India which might be explained by the large population of the India. In both countries, the performances of capital markets has increased as well over the years under study with India being considerably better than South Africa in capital markets performance.

Chapter-V

Findings, Suggestions and Conclusion

5.1. Findings

There is an increasing trend over the years in the capital markets variables under this study for both India and South Africa. The collected data is of time series nature. The researcher has studied four variables for each country which were all non-stationary at levels and all became stationary at first difference.

The researcher has found that there is at most **one co-integrating relationship** with both the co-integration tests (Trace test and Maximum Eigen) in the time series under study for the country India. For the case of South Africa, the researcher has found that there are at most **three co-integrating relationship** with the co-integration test (Trace test) and at most **one co-integrating relationship** with the co-integration test (Maximum Eigen) in the time series under study.

The researcher has observed that the co-integrating vector of India built with VECM model displays a negative relationship between the dependent variable (GDP) and all the independent variables (EXCHR, MCAP, and STVL), and there is a long run relation between the variables. The co-integrating vector of South Africa shows that there is a negative relationship as well between the dependent variable (GDP) and all the independent variables (EXCHR, MCAP, and STVL) when there is one co-integrating relationship, and there is a long run relation between the variables.

5.2. Suggestions

There are various factors that contribute to the long term economic growth of any country, especially developing countries. It is suggested that countries like India and South Africa should focus on the key economic objectives such that they improve their low economic conditions.

The countries should develop the financial sector as it is essential for any economy to reach sustainable growth. In fact, some authors have noted that the more developed a financial sector is, the more capable it is to absorb and utilize capital markets in the long run. Financial development is not only important for economic growth but can also cause economic growth.

There are some other factors as well that both India and South Africa should consider to attain sustainable economic growth such as political and macroeconomic stability, increase of income levels. India should work especially on increasing the rate of employment growth and South Africa on the political stability.

5.3. Conclusion

Given the current scenario of COVID-19, many countries' economies are negatively affected. South Africa has been affected the most in comparison to India, however how the countries will handle the coming years will play a major role on the sustainability of their economic growths.

In this study, the researcher has observed the performances of capital markets in India and South Africa from the year 2000 to the year 2020. Both countries have increasing trends in their capital markets. The variables under study for both countries were Gross Domestic Product, Exchange Rate, Market Capitalization and Stock Traded Value.

It can be concluded that the Gross Domestic Products of India and South Africa do significantly affect their economy. Given the fact that all co-integration tests suggested that there are co-integrating vectors, this supports the finding that capital markets do have an impact on economic growth in India and in South Africa. Therefore, it can be agreed upon that there is an impact of capital markets performance on a country's economic growth.

References

Bibliography

1. Aderibigbe Temitope James, A. K. (2015). Opportunities and Problems of Investing in the African Stock Exchange: A Selection of NSE, GSE & RSE. *IOSR Journal of Business and Management*, 9.

2. Barra, M. (2010). Is There a Link Between GDP Growth and Equity Returns? *MSCI Barra Research Bulletin*, 10.

3. Chimpango, B. K. (2014). *The Development of African Capital Markets: A Legal and Institutional approach.* UK: Nottingham Trent University.

4. Damodar N Gujarati, D. C. (2021). *Basic Econometrics Sixth Edition.* Chennai: McGraw Hill Education.

5. Irrinki, M. K. (2019). Impact of Capital Market on the Indian Economy. *Pramana Research Journal*, 11.

6. Jacob, P. (2017). Economic Reforms and Its Impact on the Indian Stock Market. *Intercontinental JOurnal of Finance research Review*, 9.

7. Nanda, S. S. (2015). India as an Emerging Financial Market: Pre and Post Liberalization Scenario. *International Journal of Business Quantitative Economics and Applied Management Research*, 15.

8. Prakasam, S. P. (2014). *Stock Market Development and Economic Growth in India: An Empirical Analysis.* Istanbul: SSBFNET.

9. Queen Sarah Khetsi, I. P. (2015). *The Impact of Capital Markets on the Economic Growth in South Africa.* Johannesburg: Journal of Governance and Regulation.

10. Rahimzadeh, F. (2012). Banking Sector, Stock Market and Economic Growth: Evidence from Mena Countries. *International JOurnal of Social Sciences and Humanity Studies*, 10.

11. Rubani, M. (2017). A study of Structure and Functions of Capital Markets in India. *International Journal of Business Administration and Management*, 12.

12. Tlegenova, D. (2015). *Forecasting Exchange Rates Using Time Series Analysis: The sample of the currency of Kazakhstan.* Singapore: Cornell University.

13. Ziorklui, S. Q. (2001). *The Development of Capital MArkets and Growth in Sub-Saharan Africa: The Case of Ghana.* Washington. DC: Howard University.

Websites

1. www.jse.co.za

2. www.nseindia.com

3. www.bseindia.com

4. www.statista.com

5. https://data.worldbank.org

6. https://www.macrotrends.net/countries/IND/india/gdp-gross-domestic-product

7. https://www.ofx.com/en-us/forex-news/historical-exchange-rates/yearly-average-rates/

8. https://ycharts.com/indicators/india_market_capitalization_of_listed_companies_usd

9. https://efinancemanagement.com/investment-decisions/capital-markets

10. https://www.pwc.co.za/en/press-room/african-capital-markets-2021.html

11. https://content.next.westlaw.com/

12. https://blog.tokenomica.com/capitalmarkets/

13. www.tradinghours.com

14. https://knoema.com

15. https://www.citeman.com/3730-history-of-the-indian-capital-market.html

16. https://investinganswers.com/dictionary/c/capital-markets

17. https://towardsdatascience.com/detecting-stationarity-in-time-series-data-d29e0a21e638

18. https://www.aptech.com/blog/a-guide-to-conducting-cointegration-tests/

19. https://www.toppr.com/guides/general-awareness/capital-markets/capital-markets-in-india/

20. https://www.mbaknol.com/financial-management/an-overview-of-indian-capital-market/

Annexure

R syntax codes

Source: R software – R-4.1.0

Syntax 1: Importing the data

```
> library(readxl)
> MPRdata <- read_excel("C:/Users/Admin/Desktop/MPRdata.xlsx")
> View(MPRdata)
```

Syntax 2: Time series plot (India GDP)

```
> India_GDP<-ts(data=`India GDP (in billion U.S. dollars)`,start=2000)
> plot(India_GDP)
```

Syntax 3: Time series plot (South Africa GDP)

```
> South_Africa_GDP<-ts(data=`South Africa GDP (in billion U.S. dollars)`,start=2000)
> plot(South_Africa_GDP)
```

Syntax 4: Time series plot (India Exchange Rate)

```
> India_Exchange_Rate<-ts(data = `India Exchange Rate  (1 unit of USD into X units of INR)`,start = 2000)
> plot(India_Exchange_Rate)
```

Syntax 5: Time series plot (South Africa Exchange Rate)

```
> South_Africa_Exchange_Rate<-ts(data = `South Africa Exchange Rate (1 unit of USD into X units of ZAR)`,start = 2000)
> plot(South_Africa_Exchange_Rate)
```

Syntax 6: Time series plot (India Market Capitalization)

```
> India_Market_Capitalization<-ts(data= `India Market Capitalization (in billion U.S. dollars)`,start=2000)
> plot(India_Market_Capitalization)
```

Syntax 7: Time series plot (South Africa Market Capitalization)

```
> South_Africa_Market_Capitalization<-ts(data= `South Africa Market Capitalization (in billion U.S. dollars)`,start=2000)
> plot(South_Africa_Market_Capitalization)
```

Syntax 8: Time series plot (India Stocks Traded Value)

```
> India_Stocks_Traded_Value<-ts(data= `India  Stocks Traded Value (in billion U.S. dollars)`,start=2000)
> plot(India_Stocks_Traded_Value)
```

Syntax 9: Time series plot (South Africa Stocks Traded Value)

```
> South_Africa_Stocks_Traded_Value<-ts(data= `South Africa Stocks Traded Value (in billion U.S. dollars)`,start=2000)
> plot(South_Africa_Stocks_Traded_Value)
```

Syntax 10: unit root test (GDP)

```
> X=ur.df(`India GDP (in billion U.S. dollars)`,type= "trend",selectlags = "AIC")
> summary(X)
```

Syntax 11: unit root test (Exchange Rate)

```
> X=ur.df(`India Exchange Rate   (1 unit of USD into X units of INR)`,type = "trend",selectlags = "AIC")
> summary(X)
```

CSIBER, Kolhapur

Syntax 12: unit root test (Market Capitalization)

```
> X=ur.df(`India Market Capitalization (in billion U.S. dollars)`,type = "trend",selectlags =
"AIC")
> summary(X)
```

Syntax 13: unit root test (Stocks Traded Value)

```
> X=ur.df(`India  Stocks Traded Value (in billion U.S. dollars)`,type = "trend",selectlags =
"AIC")
> summary(X)
```

Syntax 14: First differences object creation

```
> D1GDP_In<-ts(data = D1LagGDP_In,start = 2002)
> D1EXCHR_In<-ts(data = D1LagEXCHR_In,start = 2002)
> D1MCAP_In<-ts(data = D1LagMCAP_In,start = 2002)
> D1STVL_In<-ts(data = D1LagSTVL_In,start = 2002)
```

Syntax 15: First differences unit root test

```
> X=ur.df(D1GDP_In,type = "drift",selectlags = "AIC")
> summary(X)
> X=ur.df(D1EXCHR_In,type = "drift",selectlags = "AIC")
> summary(X)
> X=ur.df(D1EXCHR_In,type = "none",selectlags = "AIC")
> summary(X)
> X=ur.df(D1MCAP_In,type = "none",selectlags = "AIC")
> summary(X)
> X=ur.df(D1STVL_In,type = "none",selectlags = "AIC")
> summary(X)
```

Syntax 16: unit root test (GDP)

```
> X=ur.df(`South Africa GDP (in billion U.S. dollars)`,type = "drift",selectlags = "AIC")
> summary(X)
```

Syntax 17: unit root test (Exchange Rate)

```
> X=ur.df(`South Africa Exchange Rate (1 unit of USD into X units of ZAR)`,type =
"trend",selectlags = "AIC")
> summary(X)
```

Syntax 18: unit root test (Market Capitalization)

```
> X=ur.df(`South Africa Market Capitalization (in billion U.S. dollars)`,type =
"trend",selectlags = 'AIC')
> summary(X)
```

Syntax 19: unit root test (Stocks Traded Value)

```
> X=ur.df(`South Africa Stocks Traded Value (in billion U.S. dollars)`,type =
"trend",selectlags = "AIC")
> summary(X)
```

Syntax 20: First differences object creation

```
> D1GDP_SA<-ts(data = D1LagGDP_SA,start = 2002)
> D1EXCHR_SA<-ts(data = D1LagEXCHR_SA,start = 2002)
> D1MCAP_SA<-ts(data = D1LagMCAP_SA,start = 2002)
> D1STVL_SA<-ts(data = D1LagSTVL_SA,start = 2002)
```

Syntax 21: First differences unit root test

```
> X=ur.df(D1GDP_SA,type = "none",selectlags = "AIC")

> summary(X)

> X=ur.df(D1EXCHR_SA,type = "none",selectlags = "AIC")

> summary(X)

> X=ur.df(D1MCAP_SA,type = "none",selectlags = "AIC")

> summary(X)

> X=ur.df(D1STVL_SA,type = "none",selectlags = "AIC")

> summary(X)
```

Syntax 22 – Packages for Johansen test

```
> library(urca)

> library(forecast)

> library(tidyverse)
```

Syntax 23 – Objects binding

```
> IndiaData<-cbind(D1GDP_In,D1EXCHR_In,D1MCAP_In,D1STVL_In)

> SouthAfricaData<-cbind(D1GDP_SA,D1EXCHR_SA,D1MCAP_SA,D1STVL_SA)
```

Syntax 24 – Lag selection criteria - Case 1: India

```
> library(vars)

> lagselect<-VARselect(IndiaData,lag.max = 7,type = "const")

> lagselect$selection

AIC(n)  HQ(n)  SC(n) FPE(n)

   3       3      3      3
```

Syntax 25 – Lag selection criteria - Case 2: South Africa

```
> lagselect<-VARselect(SouthAfricaData,lag.max = 7,type = "const")
> lagselect$selection
AIC(n)  HQ(n)  SC(n) FPE(n)
   3       3      3      2
```

Syntax 26 – Case 1: India

```
> ctest1t<-ca.jo(IndiaData,type = "trace",ecdet = "const",K=2)
> summary(ctest1t)
```

Syntax 27 – Case 2: South Africa

```
> ctest1t<-ca.jo(SouthAfricaData,type = "trace",ecdet = "const",K=2)
> summary(ctest1t)
```

Syntax 28 – Case 1: India

```
> ctest2e<-ca.jo(IndiaData,type = "eigen",ecdet = "const",K=2)
> summary(ctest2e)
```

Syntax 29 – Case 2: South Africa

```
> ctest2e<-ca.jo(SouthAfricaData,type = "eigen",ecdet = "const",K=2)
> summary(ctest2e)
```

Syntax 30 – Packages for VECM

```
> library(tsDyn)
> library(vars)
> library(forecast)
> library(tidyverse)
```

CSIBER, Kolhapur

Syntax 31 – Building VECM model - Case 1: India

```
> Model1<-VECM(IndiaData,2,r=1,estim = "2OLS")
> summary(Model1)
```

Syntax 32 – Building VECM model - Case 2: South Africa

```
> Model2<-VECM(SouthAfricaData,2,r=3,estim = "ML")
> summary(Model2)
```